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Day 7 • English notes

Topics 61–70

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Topic 61 Carnatic Wars and the Anglo-French rivalry

English

1. Concept in one line

The Carnatic Wars were three rounds of fighting in south India in the middle of the eighteenth century, in which the English and French East India Companies fought each other, often as allies of rival claimants at Arcot and Hyderabad, and the English came out on top. The examination asks which European war, battle, commander and treaty go with each war, and why the English won.

2. Revision notes

2.1 The French Company and Dupleix

- **Founded:** the French East India Company was set up in 1664 under Jean-Baptiste Colbert, finance minister of King Louis XIV. Wikipedia's "French India" article adds that an earlier company, formed in 1642 under Cardinal Richelieu, was reconstructed in 1664.
- **A company of the state:** by 1668 the king was its largest investor, and he kept control of it (Britannica).
- **First factories:** Surat (1668) and Masulipatnam (1669).
- **Settlements:** Pondicherry (the area was acquired in 1673; François Martin, its first Governor, built it up from 1674; it became the capital of French India), Chandernagore in Bengal (1692), Yanam (1723), Mahe on the Malabar coast (1725; Britannica gives 1724) and Karaikal (1739). Mauritius was acquired in 1721.
- **Dupleix:** Joseph-François Dupleix became a member of the council at Pondicherry in 1720 and headed the French factory at Chandernagore from 1731 (Britannica). He was Governor of Pondicherry from 1742 to 1754. He aimed at a French territorial empire in India, though the French government had little interest in it.
- The French company and the other Europeans are taken up in Topic 202.

2.2 Why the Carnatic

- **The region:** Britannica describes the Carnatic of these wars as the coastal strip of eastern India from Nellore southwards into the Tamil country. It is not the present State of Karnataka. Madras (Topic 52) and Pondicherry both lay on this coast.
- **Nawab and Nizam (old NCERT):** Nizam-ul-Mulk Asaf Jah founded the state of Hyderabad in 1724. The Carnatic was one of the subahs (provinces) of the Deccan, so it came under the Nizam's authority. Its Deputy Governor was called the Nawab of the Carnatic, and his seat was Arcot. In practice he had freed himself from the Nizam's control and made his office hereditary.
- After 1740 there were repeated struggles for the Nawabship. Old NCERT says this gave the European trading companies their opportunity to interfere in Indian politics.

- **1748:** Nizam-ul-Mulk died. Disputes over two thrones now ran together, and Dupleix took a side in each.

Throne	Claimant backed by Dupleix	His rival
Hyderabad: the Nizam, Subahdar (governor) of the Deccan	Muzaffar Jang; after his death, Salabat Jang	Nasir Jang
Arcot: the Nawab of the Carnatic	Chanda Sahib	Nawab Anwar-ud-din; after his death, Muhammad Ali, whom the English backed

2.3 The three wars compared

Point	First Carnatic War	Second Carnatic War	Third Carnatic War
Years	1746 to 1748 (the fighting in India)	1749 to 1754	1756 to 1763 (main fighting 1758 to 1761)
European war	War of the Austrian Succession (1740 to 1748)	None: Britain and France were at peace in Europe	Seven Years' War (1756 to 1763)
Immediate cause in India	The European war reached India, and a French fleet under La Bourdonnais came from Mauritius	The death of Nizam-ul-Mulk in 1748, and the succession disputes at Hyderabad and Arcot	War began again in Europe and was renewed in India
Main events	Madras captured (September 1746); the Nawab's army beaten at St Thome on the Adyar (1746); French attacks on Fort St David fail; the English siege of Pondicherry fails (1748)	Ambur (1749); Salabat Jang made Nizam, with Bussy at Hyderabad (1751); Clive seizes and defends Arcot (1751); the French force that had besieged Trichinopoly is defeated and surrenders (June 1752)	Lally takes Fort St David (1758); his attack on Madras fails (1758-59); the French lose the Northern Circars (1759); Wandiwash (22 January 1760); Pondicherry surrenders (January 1761)
French side	La Bourdonnais (fleet), Paradis (St Thome), Dupleix as Governor	Dupleix as Governor, Bussy at Hyderabad	Count de Lally; Bussy, taken prisoner at Wandiwash
English side	Peyton (fleet, 1746), Boscawen (siege of Pondicherry, 1748)	Robert Clive (Arcot)	Forde (Masulipatnam), Eyre Coote (Wandiwash)
Treaty	Treaty of Aix-la-Chapelle, 1748: Madras went back to the English in exchange for Cape Breton Island	Pondicherry settlement, December 1754, with January 1755 as the stated commencement date: Muhammad Ali's position secured	Treaty of Paris, 10 February 1763: the French factories restored, with limits
Result	No change of territory. But a small French force had beaten the Nawab's army	The English candidate held the Carnatic. The French kept their hold on Hyderabad and the Northern Circars	The English were supreme in the south. The French stayed on in their settlements

- Britannica does not number the wars. The numbering is the textbooks' way of dividing one Anglo-French struggle.

2.4 The First War: Madras and St Thome

- **At sea:** on 6 July 1746 La Bourdonnais and Peyton fought an indecisive action off Negapatam. The English fleet then withdrew to Bengal.
- **Madras:** La Bourdonnais took Madras after a week's siege in September 1746 (Britannica). He entered Fort St George on 21 September (Dodwell).
- **The quarrel:** La Bourdonnais agreed to give Madras back for a ransom. Dupleix refused. A storm then wrecked the fleet, and La Bourdonnais left Indian waters for good (Dodwell).
- **St Thome (the Adyar):** Dupleix had promised to hand Madras to Nawab Anwar-ud-din, but the French kept it. The Nawab's son Mahfuz Khan came with an army of 10,000. On 24 October 1746 (Old Style), equivalent to 4 November (New Style), on the Adyar river near St Thome (San Thome), a small force under Paradis forded the river and broke the Nawab's line. The force combined European infantry and Indian sepoys. Estimates of its strength vary; the lesson is the effectiveness of disciplined, coordinated infantry rather than a fixed troop-count formula.
- **Why it mattered:** a small force of well-equipped, disciplined infantry had beaten a far larger army of infantry and cavalry. Wikipedia's article says the battle showed that even a large cavalry force was no match for such infantry; Dodwell does not accept the older view that it was the first battle to show European military superiority.
- **1748:** Boscawen besieged Pondicherry and gave up the siege in October. The Treaty of Aix-la-Chapelle ended the war. Madras went back to the English in exchange for Cape Breton Island (Britannica). Wikipedia's article names the French fortress of Louisbourg in North America, which the British had captured. Louisbourg stands on Cape Breton Island (Britannica's article on Louisbourg), so the two sources say the same thing.

2.5 The Second War: Ambur, Hyderabad and Arcot

- **Ambur (1749):** Chanda Sahib's side, backed by Dupleix, killed Nawab Anwar-ud-din in battle. Chanda Sahib was seated at Arcot.
- **Hyderabad:** Nasir Jang was murdered in December 1750; Muzaffar Jang died in February 1751, about two months later. The French then placed Salabat Jang on the throne. Bussy remained an influential French commander at Hyderabad; revenues assigned from the Northern Circars supported the French force (Topic 551). The revenue grants and subsequent British acquisition must be kept distinct from the succession itself.
- **Arcot:** the English backed Muhammad Ali, who was shut up in Trichinopoly. Clive seized Arcot in August 1751 with a small force of European soldiers and Indian sepoys, then defended it against a much larger force in September–November. The *History of the Madras Army*, quoting military records, dates the defence from 25 September to 14 November; the frequently quoted 50-day and 53-day counts reflect different starting dates and counting conventions. This drew off part of Chanda Sahib's army. Muhammad Ali gained allies from Tanjore and the Marathas. The French force that was besieging Trichinopoly with Chanda Sahib was defeated. It fell back to the island of Srirangam, was besieged there, and surrendered in June 1752 (the month is Britannica's; the place is from Wikipedia's article on the siege of Trichinopoly).

- **Recall of Dupleix:** Godeheu replaced Dupleix in August 1754, and Dupleix was recalled to France.
- **Treaty of Pondicherry (1754–55):** Godeheu and the English governor Thomas Saunders reached provisional terms in December 1754. The British Library catalogue records the truce signed at Pondicherry on 26 December and at Fort St George on 31 December 1754. Its stated commencement date was 11 January 1755, explaining why textbooks use either 1754 or 1755. The settlement secured Muhammad Ali's position in the Carnatic; the French retained their influence at Hyderabad. It was a truce, not a final end to Anglo-French rivalry.

2.6 The Third War: Lally, Wandiwash and the Treaty of Paris

- **Lally:** the first British force was diverted to Bengal (Plassey is in Topic 311). Count de Lally arrived in 1758. He took Fort St David, but his attack on Madras in 1758-59 failed. Britannica calls him brave but headstrong and tactless.
- **Northern Circars and Andhra:** in October 1758 Colonel Francis Forde's force sailed from Bengal towards Visakhapatnam to create a diversion against the French. Forde defeated Conflans at Condore, also known as Chandurthi, in December 1758. He stormed Masulipatnam in April 1759. These victories broke French military power on this coast, but they did not by themselves transfer every Northern Circar outright to the Company. Distinguish the campaign of 1758–59 from Shah Alam II's later grant of the Northern Circars in 1765 (Topic 551).
- **Wandiwash, 22 January 1760:** Lally tried to retake the fort of Wandiwash. Eyre Coote attacked and routed him: about 1,700 British troops against about 2,000 French. Bussy was taken prisoner. Britannica calls it the decisive battle of the Anglo-French struggle in southern India.
- **Pondicherry:** it surrendered in January 1761 after an eight-month siege. Lally was later tried in Paris and executed.
- **Treaty of Paris (10 February 1763), Article XI:** it has four points. One: Britain restored to France the factories that France had held at the beginning of 1749. Two: France gave up what it had acquired on the Coromandel and Orissa coasts after that. Three: France agreed not to build fortifications or keep troops in the dominions of the Subahdar of Bengal. Four: both sides recognised Muhammad Ali as Nawab of the Carnatic and Salabat Jang as Subahdar of the Deccan. The treaty's own word for the Subahdar is "Subah".
- Pondicherry was returned to France in 1765. Pondicherry, Karaikal, Mahe and Yanam passed to India, in fact, only on 1 November 1954.

2.7 Why the English won

Reason	What it meant in these wars	Who says so
Sea power	British command of the sea was decisive. Madras could be supplied from Britain and Bengal, while Lally lacked money and supplies from France. Before Wandiwash, Lally lost his sea support when the French fleet withdrew	Britannica

Reason	What it meant in these wars	Who says so
The resources of Bengal	Bengal sent supplies to Madras. Troops sent by Clive from Bengal took the Northern Circars from the French	Britannica
The nature of the two companies	The French company was controlled by the French government and suffered from its changes of policy. The English Company was run by its own elected Directors (Topic 52)	Britannica
Leadership, and the recall of Dupleix	La Bourdonnais and Dupleix quarrelled in 1746. Dupleix was dismissed and recalled in 1754. Lally was brave but tactless. On the English side, Clive and Coote won the decisive actions	Britannica; Wikipedia's "French India"

2.8 Where the books differ

Point	What each source gives
Years of the First War	Britannica's account of the fighting in India runs from 1746 to 1748. Wikipedia's article dates the first war from 1740 to 1748, the years of the European war, and says Britain was drawn in against France in 1744
Years of the Third War	War was renewed in India in 1756 (Britannica), but Lally arrived only in 1758. The fighting ended in 1761; the treaty came in 1763
Pondicherry settlement	Provisional agreement/truce signed in December 1754; stated commencement date of 11 January 1755. These dates explain the two years found in textbooks
Dates in 1746	Dodwell prints two dates, 11 days apart, for events of 1746: the bombardment of Madras began on "September 7/18". So the same event can carry two dates in different books
End of Dupleix's term	Britannica: replaced in August 1754. Wikipedia's "French India": he governed till 15 October 1754
Surrender of Pondicherry	Britannica: surrendered on 16 January 1761. Wikipedia's "French India": occupied by the British from 15 January 1761

- For the examination: Aix-la-Chapelle 1748, Pondicherry provisional settlement 1754 / stated commencement year 1755, Wandiwash 22 January 1760, Paris 1763.

3. Extra section: chronology, 1664 to 1765

Year	Event
1664	French East India Company set up under Colbert

Year	Event
1673	Area of Pondicherry acquired; François Martin builds it up from 1674
1724	Nizam-ul-Mulk founds the state of Hyderabad
1742	Dupleix becomes Governor of Pondicherry
1746	Naval action off Negapatam (6 July); La Bourdonnais takes Madras (September); Paradis defeats Mahfuz Khan at St Thome on the Adyar (24 October Old Style / 4 November New Style)
1748	Death of Nizam-ul-Mulk; the English siege of Pondicherry fails (October); the Treaty of Aix-la-Chapelle returns Madras
1749	Battle of Ambur: Nawab Anwar-ud-din killed
1750	Nasir Jang murdered (December)
1751	Muzaffar Jang murdered; the French make Salabat Jang the Nizam; Clive seizes Arcot (August) and successfully defends it in September–November
1752	The French force that had besieged Trichinopoly is defeated and surrenders (June)
1754	Godeheu replaces Dupleix (August); Dupleix recalled; Treaty of Pondicherry
1756	Seven Years' War begins; war renewed in India
1757	The English take Chandernagore
1758	Lally arrives and takes Fort St David; his attack on Madras begins; Forde's expedition from Bengal and victory at Condore/Chandurthi (December)
1759	The attack on Madras fails; Forde storms Masulipatnam (April), breaking French military power on the coast
1760	Battle of Wandiwash (22 January): Eyre Coote defeats Lally
1761	Pondicherry surrenders (January) after an eight-month siege
1763	Treaty of Paris (10 February)
1765	Pondicherry returned to France; Shah Alam II's grant of the Northern Circars to the Company

4. Three common exam traps

1. **Two thrones, two sets of names.** The fight at Hyderabad was for the Nizam's seat: Nasir Jang against Muzaffar Jang; after both were dead, Salabat Jang became Nizam. The fight at Arcot was for the Nawabship of the Carnatic: Chanda Sahib against Anwar-ud-din, and then against Muhammad Ali. Dupleix backed Muzaffar Jang and Chanda Sahib; the English backed Muhammad Ali. A question that makes Chanda Sahib a claimant at Hyderabad, or Salabat Jang a Nawab of the Carnatic, is wrong.

2. **Wandiwash was decisive, but it was not the end.** The battle came a year before Pondicherry surrendered, and the peace treaty was signed two years after that. The French were not driven out of India: they got their settlements back and stayed in them till the middle of the twentieth century. “The French left India after Wandiwash” is wrong.
3. **Dupleix, Bussy, Lally and Godeheu belong to different stages.** Dupleix was the Governor at Pondicherry who made the policy; he had been recalled before the Third War began. Bussy was his man at Hyderabad, and was later taken prisoner in the battle that decided the Third War. Lally came only for the Third War, and it was he who surrendered Pondicherry. Godeheu was the man who replaced Dupleix. A question that puts Dupleix in command in 1760 is wrong.

7. Sources

7.1 Sources

S1 Bipan Chandra, *Modern India: A History Textbook for Class XII*, National Council of Educational Research and Training (NCERT), New Delhi, first edition June 1971, reprint April 1982 (the “old NCERT”), Chapter II “Indian States and Society in the 18th Century”, the passage on Hyderabad and the Carnatic. Internet Archive scan: https://archive.org/details/dli.ernet.231730 (text at https://archive.org/stream/dli.ernet.231730/231730-Modern%20India%20A%20History%20Textbook%20For%20Class-xii_djvu.txt)

Hyderabad founded by Nizam-ul-Mulk Asaf Jah in 1724; his death in 1748; the Carnatic as one of the subahs of the Deccan under the Nizam’s authority; the Nawab of the Carnatic as Deputy Governor who had freed himself and made his office hereditary; repeated struggles for the Nawabship after 1740, which gave the European trading companies an opportunity to interfere in Indian politics

S2 Encyclopaedia Britannica, “India”, section “The Anglo-French struggle, 1740-63” (with the passage on European military superiority that follows it). https://www.britannica.com/place/India/The-Anglo-French-struggle-1740-63

War of the Austrian Succession from 1740; La Bourdonnais sailing from Mauritius, driving the British fleet towards Bengal and taking Madras after a week’s siege in September 1746; his quarrels with Dupleix, governor of Pondicherry; Dupleix repelling the English attack on Pondicherry; Treaty of Aix-la-Chapelle (1748) and Madras returned in exchange for Cape Breton Island; death of Nizam al-Mulk in 1748; Dupleix backing Muzaffar Jang and Chanda Sahib; the Carnatic nawab killed at Ambur (1749); Nasir Jang murdered in December 1750, Muzaffar Jang three months later, Salabat Jang placed on the throne by the French; Bussy at Hyderabad and the revenues of the Northern Sarkars; the British backing Muhammad Ali at Trichinopoly; Clive at Arcot in August 1751 with 210 men, the 50-day defence, allies from Tanjore and the Marathas; French defeat and surrender in June 1752; Godeheu replacing Dupleix in August 1754 and his settlement; war resumed in India in 1756, first British force diverted to Bengal; Lally’s arrival in 1758, Fort St David, the failed attack on Madras in 1758-59, his character; Clive’s troops from Bengal defeating the French garrison in the Northern Sarkars; Coote and Wandiwash, January 1760, Bussy captured; eight-month siege and surrender of Pondicherry, January 1761; reasons for the British success (command of the sea, supply from Britain and Bengal, the French company controlled by the French government)

S3 Encyclopaedia Britannica, “Carnatic Wars”. https://www.britannica.com/event/Carnatic-Wars

The Carnatic as the coastal strip of eastern India from Nellore southwards into the Tamil country; succession disputes in the Carnatic and Hyderabad; Dupleix governor of Pondicherry from 1742 to 1754; Bussy controlling Hyderabad for seven years; Clive checking Dupleix in 1751 and the defeat of the French claimant the next year; Seven Years’ War (1756 to 1763); Wandiwash 1760 and Pondicherry 1761; the article does not number the wars

S4 Encyclopaedia Britannica, “French East India Company”. https://www.britannica.com/topic/French-East-India-Company

Colbert, finance minister to Louis XIV, as founder; the king as largest investor by 1668 and his control; Mauritius acquired in 1721 and Mahe in 1724; Dupleix governor-general of French India in 1742; a private war between the two companies from 1751; Dupleix recalled to Paris in 1754; Pondicherry, capital of French India, captured in 1761

S5 Encyclopaedia Britannica, “Battle of Wandiwash”. https://www.britannica.com/event/Battle-of-Wandiwash

Date, 22 January 1760; “the decisive battle in the Anglo-French struggle in southern India”; Lally and Eyre Coote; about 1,700 British troops against about 2,000 French; Lally’s loss of sea support when d’Aché’s fleet withdrew, his lack of funds; his attempt to retake Wandiwash; Bussy captured; Pondicherry surrendered on 16 January 1761; Lally tried in Paris and executed

S6 Henry Dodwell, *Dupleix and Clive: The Beginning of Empire*, Methuen, London, 1920, Introduction (pp. xv to xvii) and Part I, Chapter I “The War of the Austrian Succession” (printed pp. 4 to 20). Internet Archive scan: https://archive.org/details/dupleixclivebegi00dodwuoft (text at https://archive.org/stream/dupleixclivebegi00dodwuoft/dupleixclivebegi00dodwuoft_djvu.txt)

The action with Peyton off Negapatam and Peyton’s withdrawal to Bengal; the double dates of 1746 (“September 7/18” for the start of the bombardment of Madras); La Bourdonnais entering the Fort on 21 September; the ransom and his quarrel with Dupleix; the storm and his leaving Indian waters; the Nawab forbidding attacks on Madras and Dupleix’s promise to hand Madras to him; Mahfuz Khan, and about 450 Europeans with some sepoys under Paradis on the Adyar; the Introduction’s remarks that Anwar-ud-din was slain in battle and Chanda Sahib seated on the masnad of Arcot, that the Subahdar of the Deccan was overlord of the Carnatic, and that the older view of the Adyar as the first sign of European military superiority is wrong

S7 The definitive Treaty of Peace and Friendship between Great Britain, France and Spain, concluded at Paris on 10 February 1763 (Treaty of Paris), text on the Avalon Project, Yale Law School. https://avalon.law.yale.edu/18th_century/paris763.asp

Date of the treaty; Article XI: restoration of the French factories held at the beginning of 1749 on the coasts of Coromandel, Orissa and Malabar and in Bengal; France’s renunciation of acquisitions on the Coromandel and Orissa coasts since then; no fortifications or troops in the dominions of the Subah of Bengal; Mahomet Ally Khan acknowledged as Nabob of the Carnatic and Salabat Jing as Subah of the Decan

S8 Wikipedia, “Carnatic wars” (citing H.H. Dodwell (ed.), *Cambridge History of India*, vol. V; M.S. Naravane, *Battles of the Honourable East India Company*, 2014; the Avalon Project text of the Treaty of Paris). https://en.wikipedia.org/wiki/Carnatic_wars

The first war dated 1740 to 1748 and Britain drawn in against France in 1744; the action of 6 July 1746 off Negapatam between La Bourdonnais and Peyton; capture of Madras dated 21 September 1746; La Bourdonnais’s promise to return Madras and Dupleix’s refusal; the Nawab’s army of 10,000 repulsed at the Adyar; failed French attacks on Fort St David; Boscawen’s siege of Pondicherry lifted in October 1748; Madras returned in exchange for Louisbourg in North America; the English capture of Chandernagore in 1757; Coote’s defeat of Lally at Wandiwash; Chandernagore and Pondicherry returned by the Treaty of Paris

S9 Wikipedia, “Battle of Adyar” (citing M.S. Naravane, *Battles of the Honourable East India Company*, 2014, p. 153; James W. Hoover, *The Origins of the Sepoy Military System: 1498-1770*, 1993, p. 56; William Dalrymple, *The Anarchy*, 2019, p. 52; S. Muthiah, “Madras Miscellany: The Battle of the Adyar”, *The Hindu*, 25 November 2012). https://en.wikipedia.org/wiki/Battle_of_Adyar

Date, 24 October 1746; Nawab Anwaruddin Khan and his son Mahfuz Khan; San Thome and the north bank of the Adyar; Paradis; about 350 French soldiers and 700 sepoys against 10,000; Paradis fording the river and the Nawab’s line breaking; the battle as showing that even a sizeable cavalry force was no match for well-equipped, disciplined infantry

S10 Wikipedia, “Treaty of Pondicherry” (citing John Keay, *The Honourable Company: A History of the English East India Company*, HarperCollins, 1993, pp. 282 to 295). https://en.wikipedia.org/wiki/Treaty_of_Pondicherry

Treaty signed in 1754 at Pondicherry; it ended the Second Carnatic War; Muhammad Ali recognised as Nawab of the Carnatic; meant to be a lasting solution, but the Third Carnatic War broke out in 1756

S11 Wikipedia, “French India” (citing Hugh Chisholm (ed.), *Encyclopaedia Britannica*, 11th edition, 1911; Benians, Newton and Rose, *The Cambridge History of the British Empire*, 1940; Philippe Haudrère, *Les Compagnies des Indes Orientales*, 2006). https://en.wikipedia.org/wiki/French_India

Company formed in 1642 under Richelieu and reconstructed in 1664 under Colbert; factories at Surat (1668) and Masulipatam (1669); Pondicherry acquired in 1673 and built up by François Martin from 1674; Chandernagore 1692; Yanam 1723; Mahe 1725; Karaikal 1739; Dupleix’s term from 14 January 1742 to 15 October 1754, his aim and the French government’s lack of interest, his dismissal and recall in 1754; Lally’s

arrival in 1758; British occupation of Pondicherry from 15 January 1761; Pondicherry returned to France in 1765; transfer of the settlements to India on 1 November 1954

S12 Wikipedia, “Northern Circars” (citing Hugh Chisholm (ed.), *Encyclopaedia Britannica*, 11th edition, 1911, “Circar”, vol. 6, p. 380). https://en.wikipedia.org/wiki/Northern_Circars

Salabat Jang’s grants to the French for their services; the conquest of the fortress of Masulipatnam in 1759, by which the coastal districts passed from the French to the British

S13 Encyclopaedia Britannica, “Joseph-François Dupleix”. https://www.britannica.com/biography/Joseph-Francois-Dupleix

Dupleix appointed to the superior council of Pondicherry in 1720; superintendent of the French factory at Chandernagore in 1731; governor-general of the French establishments in India in 1742; the Treaty of Aix-la-Chapelle (1748) ending the war in Europe and restoring Madras; his backing of Chanda Sahib and the “largely private war” between the two companies from 1751; his recall to Paris in 1754

S14 Wikipedia, “Siege of Masulipatam” (its list of sources: Robert Harvey, *Clive: The Life and Death of a British Emperor*, Sceptre, 1999; John Keay, *The Honourable Company*, HarperCollins, 1993; Frank McLynn, *1759: The Year Britain Became Master of the World*, Pimlico, 2005; Britannica, “Machilipatnam”). https://en.wikipedia.org/wiki/Siege_of_Masulipatam

Colonel Francis Forde as the British commander; the siege of Masulipatnam from 6 March 1759 and the storming of the town on 7 April 1759

S15 Wikipedia, “Francis Forde (East India Company officer)” (its list of sources: Robert Harvey, *Clive: The Life and Death of a British Emperor*, Sceptre, 1999; H. M. Stephens, revised by D. J. Prior, in the *Oxford Dictionary of National Biography*, vol. 20, Oxford University Press, 2004; John Keay, *The Honourable Company*, HarperCollins, 1993). https://en.wikipedia.org/wiki/Francis_Forde_(East_India_Company_officer)

Forde given a detachment and ordered to drive the French from Masulipatnam; his rout of the French force at the battle of Condore

S16 Wikipedia, “Siege of Trichinopoly (1751-1752)” (its list of sources: M. S. Naravane, *Battles of the Honourable East India Company*, 2014, p. 155; Henry Dodwell, *Dupleix and Clive: The Beginning of Empire*, Asian Educational Services, 1989; J. L. Mehta, *Advanced Study in the History of Modern India 1707-1813*). https://en.wikipedia.org/wiki/Siege_of_Trichinopoly_(1751%E2%80%931752)

Chanda Sahib’s siege of Trichinopoly, held by Muhammad Ali, with the siege operations carried on mainly by the French contingent; the French falling back to the island of Srirangam and being besieged there; the surrender of the French troops in June

S17 Encyclopaedia Britannica, “Louisbourg”. https://www.britannica.com/place/Louisbourg

Louisbourg on the east side of Cape Breton Island; its capture in 1745 by a force from New England with British naval support; its restoration to France by the Treaty of Aix-la-Chapelle in 1748

S18 W. J. Wilson, *History of the Madras Army*, vol. I (1882), printed pp. 26–28, 104–105 and Appendix D, p. 378; digitised by Tamil Virtual Academy. https://tamildigitallibrary.in/assets/docs/uploads/primary_files/book/TVA_BOK_0058898/TVA_BOK_0058898_History_of_the_Madras_Army_Vol_1_1882.pdf

Official military compilation quoting contemporary records: Arcot defence, December 1754 provisional truce, Forde’s October 1758 departure, Condore in December 1758 and Masulipatnam in April 1759

S19 British Library, India Office Records, Mss Eur Orme OV.52, item 1, pp. 1–4. https://searcharchives.bl.uk/catalog/040-003421527

Catalogue of original truce copy: signatures at Pondicherry on 26 December 1754 and Fort St George on 31 December 1754

S20 Government of Puducherry, Gazetteer, “The modern period”, printed pp. 175–176 and 189. https://statistics.py.gov.in/sites/default/files/ii-iii-the-modern-period.pdf

Adyar action on 4 November 1746 New Style; December 1754 truce terms and stated commencement date of 11 January 1755; context for differing textbook years

S21 Government of Andhra Pradesh, Vizianagaram District, “History and Culture”. https://vizianagaram.ap.gov.in/culture-heritage/

Chandurthi, 1758; later Mughal grant of the Northern Circars in 1765, distinct from the campaign

S22 Maharashtra State Gazetteers, *History and Culture*, Maratha period, ch. 8, printed p. 195. https://www.gazetteers.maharashtra.gov.in/cultural.maharashtra.gov.in/english/gazetteer/History%20Part/History_III/chapter_8.pdf

Nasir Jang’s death in December 1750 and Muzaffar Jang’s in February 1751; used only for month/year because precise day varies in other official compilations

Topic 62 Article 12 and Article 13: ‘State’ and laws inconsistent with fundamental rights

English

1. Concept in one line

Article 12 says what “the State” means in Part III, and Article 13 makes a law void to the extent that it is inconsistent with the Fundamental Rights. The examination asks for the exact words of the two Articles, the bodies that the Supreme Court has and has not treated as “State”, and the doctrines built on Article 13 with their cases.

2. Revision notes

2.1 Part III, and why it opens with a definition

- Part III, “Fundamental Rights”, runs from Article 12 to Article 35 (Topic 42). Its first group of Articles, headed “General”, has only Articles 12 and 13. The Right to Equality begins at Article 14 (Topic 73).
- Part III speaks to “the State”: Article 13(2), for example, begins “The State shall not make any law …”. So the reader must first be told who “the State” is. Article 12 does that, and Article 13 then says what happens to a law that goes against the rights.

2.2 Article 12: the text and its four limbs

The marginal heading of Article 12 is “Definition”. The Article reads:

> In this Part, unless the context otherwise requires, “the State” includes the Government and Parliament of India and the Government and the Legislature of each of the States and all local or other authorities within the territory of India or under the control of the Government of India.

- This is the wording of the official text “as on 1st May, 2024” (Topic 42). That text carries no footnote to Article 12: the Article has not been amended.
- **“In this Part”:** by its own words, the definition is for Part III.
- **“includes”:** the list is not closed. The Supreme Court has noted that a definition which uses the word “includes” is generally not exhaustive.

No.	Words of Article 12	What it covers
1	“the Government and Parliament of India”	The Union Government and Parliament
2	“the Government and the Legislature of each of the States”	The Government of every State and its Legislature. The word is “Legislature”, not “Legislative Assembly”
3	“all local … authorities”	Bodies of local government, such as the Municipalities and the Panchayats

No.	Words of Article 12	What it covers
4	"… or other authorities"	The Constitution does not define these words. The Supreme Court has given them their meaning (2.3)

- **"Local authority"** is defined in section 3(31) of the General Clauses Act, 1897. It means "a municipal committee, district board, body of port commissioners or other authority" legally entitled to, or entrusted by the Government with, "the control or management of a municipal or local fund".
- The closing words, "within the territory of India or under the control of the Government of India", go with "local or other authorities". The two halves are joined by "or": an authority comes in on either ground.

2.3 "Other authorities": six decisions of the Supreme Court

Decision	Body in question	What the Court said
Rajasthan State Electricity Board v. Mohan Lal (1967)	A State Electricity Board	"Other authorities" include "all constitutional or statutory authorities on whom powers are conferred by law". The Court refused to apply the rule of ejusdem generis, under which general words are limited to things of the same kind as those named before them
Sukhdev Singh v. Bhagatram (1975)	Three statutory corporations: the Oil and Natural Gas Commission (ONGC), the Life Insurance Corporation (LIC) and the Industrial Finance Corporation (IFC)	They are "authorities" within Article 12. Justice Mathew: a State "can only act through the instrumentality or agency of natural or juridical persons"
Ramana Dayaram Shetty v. International Airport Authority (1979), usually cited as R.D. Shetty	The International Airport Authority of India, a statutory corporation	The test is whether the corporation is "really an agency of the Government". A body that is an instrumentality or agency of the Government is an "authority"
Ajay Hasia v. Khalid Mujib Sehravardi (1981)	A society registered under the Jammu and Kashmir Registration of Societies Act, 1898, which ran a college	The body was a registered society, not a statutory corporation. The Court set out six tests of instrumentality or agency (Section 3)
Pradeep Kumar Biswas v. Indian Institute of Chemical Biology (16 April 2002), seven judges	The Council of Scientific and Industrial Research (CSIR)	CSIR is "well within the range of Article 12". An earlier decision, Sabhajit Tewary, was overruled. The Ajay Hasia tests were restated. Two of the seven judges dissented

Decision	Body in question	What the Court said
Zee Telefilms Ltd. v. Union of India (2 February 2005), five judges	The Board of Control for Cricket in India (BCCI)	The Board "cannot be held to be a State for the purpose of Article 12". Justice S.B. Sinha and Justice S.N. Variava took the opposite view

How Pradeep Kumar Biswas (2002) restated the test:

- The Ajay Hasia tests "are not a rigid set of principles". The question is whether the body is "financially, functionally and administratively dominated by or under the control of the Government".
- Such control "must be particular to the body in question and must be pervasive". Where the control is "merely regulatory whether under statute or otherwise", it does not make the body a State.
- Zee Telefilms (2005) applied this test to the BCCI. The details are in Section 3.

2.4 Is the judiciary "State"?

- Article 12 does not expressly name the courts. Separate **judicial decisions** from **administrative action and rule-making**. Here, "superior courts" means the Supreme Court and the High Courts. A ruling about challenging their judicial orders under Article 32 is not a general exemption of the judiciary from the Constitution.
- **Naresh Shridhar Mirajkar (1966), nine judges:** a High Court's judicial order in a case before it cannot be challenged through a fresh writ petition under Article 32. The proper appellate or review route is different from an original Fundamental Rights petition.
- **A.R. Antulay v. R.S. Nayak (1988):** the Supreme Court recognised its power to correct its own earlier error. This does not create an ordinary Article 32 appeal against every judicial decision.
- **Rupa Ashok Hurra v. Ashok Hurra (10 April 2002), five judges:** a final Supreme Court judgment cannot be challenged by an Article 32 petition, even after a review petition has failed. Its observations excluding superior courts from Article 12 must be read in this judicial-order context. The Court recognised a narrowly limited **curative petition**, addressed to the Supreme Court itself, to prevent abuse of process or a gross miscarriage of justice; it is an exceptional remedy, not a regular further appeal.
- **Administrative and rule-making functions:** court establishments remain bound by constitutional equality when dealing with staff and service rules. In **Supreme Court Employees' Welfare Association v. Union of India (1989)**, rules under Article 146(2) were held subject to constitutional principles, including Articles 14 and 16. **Prem Chand Garg (1963)** is the leading example of a Supreme Court rule under Article 145 being invalidated for infringing a Fundamental Right. Challenging such a rule is distinct from attacking a judicial decision through Article 32. In an exam, qualify the statement "the judiciary is not State" by the function being discussed.

2.5 Fundamental Rights against persons other than the State

- **Kaushal Kishor v. State of Uttar Pradesh (3 January 2023).** One question before the Supreme Court was whether a Fundamental Right under Article 19 or 21 can be claimed "other than against the 'State' or its instrumentalities". The answer given: "A fundamental right under Article 19/21 can be enforced even against persons other than

the State or its instrumentalities." The judgment calls this the "horizontal effect" of a right.

- **Scope of the 2023 ruling:** this was the majority view, by 4 to 1, on this issue. Articles 15(2), 17, 23 and 24 also contain important protections that operate against private conduct. Thus, "all Fundamental Rights are enforceable only against the State" is an unsafe blanket statement.
- **How to read this with Zee Telefilms:** deciding whether a body is "State" under Article 12 and deciding whether a particular right binds a private person are different questions. Zee Telefilms held that BCCI was not Article 12 State and dismissed that Article 32 petition; it also recognised the Article 226 route for public duties. Kaushal Kishor recognised the horizontal reach of Articles 19 and 21. It did not turn every private body into "State", or every private dispute into an automatic writ case. The right, public duty and remedy must be identified. The Supreme Court applied the 2023 majority ruling to private examination bodies in **Gulshan Kumar v. Institute of Banking Personnel Selection (3 February 2025)**, concerning disability-related examination accommodations.

2.6 Article 13: the text, clause by clause

The marginal heading is "Laws inconsistent with or in derogation of the fundamental rights". Clause (3) opens with the words "In this article, unless the context otherwise requires,".

Clause	Text	Point to remember
(1)	"All laws in force in the territory of India immediately before the commencement of this Constitution, in so far as they are inconsistent with the provisions of this Part, shall, to the extent of such inconsistency, be void."	It deals with laws that were in force before 26 January 1950
(2)	"The State shall not make any law which takes away or abridges the rights conferred by this Part and any law made in contravention of this clause shall, to the extent of the contravention, be void."	It is a bar on new laws, addressed to "the State"
(3)(a)	"'law' includes any Ordinance, order, bye-law, rule, regulation, notification, custom or usage having in the territory of India the force of law;"	Eight things are named. So "law" here is much wider than an Act of a legislature

Clause	Text	Point to remember
(3)(b)	"'laws in force' includes laws passed or made by a Legislature or other competent authority in the territory of India before the commencement of this Constitution and not previously repealed, notwithstanding that any such law or any part thereof may not be then in operation either at all or in particular areas."	An old law that was not repealed counts, even if it was not then in operation
(4)	"Nothing in this article shall apply to any amendment of this Constitution made under article 368."	It was not in the Constitution of 1950. Section 2 of the Constitution (Twenty-fourth Amendment) Act, 1971 inserted it, with effect from 5 November 1971 (2.8)

- In clauses (1) and (2) the word "void" is limited each time: "to the extent of such inconsistency", "to the extent of the contravention" (Topic 42).
- Article 13 does not use the words "judicial review".

2.7 The doctrines the courts built on Article 13

Doctrine	Leading case	What it means
Judicial review	A.K. Gopalan v. State of Madras (19 May 1950)	The courts can declare a law void for infringing a Fundamental Right. Chief Justice Kania said that putting clauses (1) and (2) of Article 13 in the Constitution "appears to be a matter of abundant caution". Even without them the Court "has always the power to declare the enactment, to the extent it transgresses the limits, invalid" (Topic 883)
Severability	A.K. Gopalan (1950); R.M.D. Chamarbaugwalla v. Union of India (9 April 1957)	Where only a part of a law offends, and that part can be separated, only that part is void. The Preventive Detention Act, 1950 was upheld except for its section 14. That section was "severable", so its invalidity "did not affect the validity of the Act as a whole"

Doctrine	Leading case	What it means
Eclipse	Bhikaji Narain Dhakras v. State of Madhya Pradesh (29 September 1955)	A pre-Constitution law that is inconsistent with a Fundamental Right is not dead. It is “eclipsed, for the time being, by the fundamental right”. If a later amendment of the Constitution takes the inconsistency away, the shadow is removed and the law can be enforced again
Waiver	Basheshar Nath v. Commissioner of Income-Tax (decided on 19 November 1958, reported in 1959)	The plea that a person had waived, that is, given up, his Fundamental Right failed before all five judges, though their reasons differed
No retrospective effect for Article 13(1)	Keshavan Madhava Menon v. State of Bombay (22 January 1951)	Article 13(1) “can have no retrospective effect but is wholly prospective in its operation”. It does not make the old laws void from the day they were made

- **R.M.D. Chamarbaugwalla (1957):** the leading statement of the severability tests. Ask whether the legislature would have enacted the valid part on its own, and whether that part can operate independently. If valid and invalid provisions are inseparably mixed, the whole relevant scheme may fail. Merely cutting words is not enough.
- **Keshavan Madhava Menon.** A pamphlet published in September 1949 led to a prosecution under the Indian Press (Emergency Powers) Act, 1931. The case was still pending on 26 January 1950. Seven judges heard the matter, and five of them held that the prosecution could go on; two dissented.
- **Bhikaji Narain Dhakras.** The C.P. and Berar Motor Vehicles (Amendment) Act, 1947 let the Provincial Government run motor transport to the exclusion of private operators. From 26 January 1950 it was inconsistent with Article 19(1)(g) (Topic 233). The First Amendment, 1951 amended Article 19(6) and so took this inconsistency away; the Fourth Amendment, 1955, which amended Article 31, removed the objection that remained. The Court added that such a law had “remained operative, even after the Constitution, as against non-citizens”. “It is only as against the citizens” that it lay “in a dormant or moribund condition”.
- **Basheshar Nath.** In 1954 an assessee agreed to a settlement under the Taxation on Income (Investigation Commission) Act, 1947. A provision of that Act had already been held void, in an earlier case, for offending Article 14. Chief Justice S.R. Das, with Justice Kapur, dealt with Article 14 only: no person can “relieve the State of the solemn obligation imposed on it by the Constitution”. Justice Bhagwati went further: “it is not open to a citizen to waive the fundamental rights conferred by Part III”. Justice S.K. Das thought that a right meant primarily for the benefit of the individual may be waived, but found no waiver proved. In an objective question, give this case for the rule that Fundamental Rights cannot be waived.

2.8 Is an amendment of the Constitution “law” under Article 13?

Stage	Answer
Shankari Prasad, the case that challenged the First Amendment of 1951	No. “Article 13(2) does not affect amendments to the Constitution made under Article 368”, because they are made “in the exercise of constituent power”. Sajjan Singh (1965) repeated this
Golak Nath (27 February 1967), 11 judges, 6 to 5	Yes. An amendment is “law” within Article 13. From that date Parliament could not amend Part III so as to take away or abridge the Fundamental Rights. Amendments already made were left undisturbed
The 24th Amendment Act, 1971 (Topic 782)	Parliament inserted clause (4) in Article 13. It also wrote into Article 368 that Parliament amends the Constitution in exercise of its constituent power
Kesavananda Bharati (24 April 1973), 13 judges	By 7 to 6 Golak Nath was overruled, and the 24th Amendment was held valid. But Article 368 does not enable Parliament to “alter the basic structure or framework of the Constitution” (Topic 123)

- The law reports spell the first case “Sankari Prasad”.

3. Extra section: the Ajay Hasia tests applied to the BCCI (Zee Telefilms, 2005)

The Court in Zee Telefilms treated the test in Pradeep Kumar Biswas as binding on it, and went through the facts about the Board one by one.

No.	Test set out in Ajay Hasia (1981)	What the Court found about the Board in Zee Telefilms (2005)
1	Is the entire share capital of the body held by the Government?	“No part of the share capital of the Board is held by the Government.”
2	Does financial assistance from the State meet almost the entire expenditure of the body?	“Practically no financial assistance is given by the Government to meet the whole or entire expenditure of the Board.”
3	Does the body enjoy a monopoly status “which is State conferred or State protected”?	The Board does enjoy a monopoly status in the field of cricket, “but such status is not State conferred or State protected”
4	Is there “deep and pervasive State control”?	“There is no existence of a deep and pervasive State control.” Such limited control as there is, is “purely regulatory”

No.	Test set out in Ajay Hasia (1981)	What the Court found about the Board in Zee Telefilms (2005)
5	Are the functions of the body "of public importance and closely related to governmental functions"?	Some duties of the Board, such as selecting the Indian cricket team, are "akin to public duties or State functions". That was not enough to make the Board "State"
6	Was a department of the Government transferred to the body?	"The Board is not created by transfer of a Government owned corporation. It is an autonomous body."

- The Court also noted that the Board is not created by a statute.
- **Result:** the Board "cannot be held to be a State for the purpose of Article 12". The writ petition under Article 32 was not maintainable, and it was dismissed.
- **The remedy that remains:** an aggrieved person can go to the ordinary courts, or file a writ petition under Article 226, "which is much wider than Article 32" (Topic 292).

4. Three common exam traps

1. **"Void" does not mean "repealed" or "dead".** Article 13(1) does not strike a pre-Constitution law off the statute book. Such a law is void only so far as it conflicts with Part III, and only for as long as the conflict lasts. It still governs what was done before 26 January 1950. Examiners write "the law ceases to exist" or "the law is wiped out"; both are wrong.
2. **Is an amendment "law"? Three answers at three dates.** The Court first said no, then yes, and then no again, each time in a different case. Candidates exchange the cases, or credit clause (4) of Article 13 to the wrong amendment or to the original Constitution. Remember also what clause (4) does not do: an amendment is outside Article 13, but it can still be tested against the basic structure.
3. **"Not State" does not mean "beyond the reach of the courts".** A failure to satisfy Article 12 does not by itself settle every remedy. Article 226 can reach a body performing a public duty, as Zee Telefilms explains; Kaushal Kishor also recognises that Articles 19 and 21 can bind private persons. These are separate questions from whether the body is an instrumentality of government. The form of an organisation alone does not settle Article 12 status: its funding, functions and governmental control matter.

7. Sources

7.1 Sources

S1 Government of India, Ministry of Law and Justice, Legislative Department, *The Constitution of India* [As on 1st May, 2024], official text with footnotes (read from character 40,000 of the file's text onwards). https://cdnbbsr.s3waas.gov.in/s380537a945c7aaa788ccfcdf1b99b5d8f/uploads/2024/07/20240716890312078.pdf

Heading "PART III" and "FUNDAMENTAL RIGHTS"; sub-heading "General" above Article 12, covering Articles 12 and 13; "Right to Equality" beginning at Article 14; Part III running from Article 12 to Article 35. Article 12: marginal heading "Definition" and the full text, with no footnote. Article 13: marginal heading "Laws inconsistent with or in derogation of the fundamental rights"; the full text of clauses (1), (2), (3) with sub-clauses (a) and (b), and (4); the opening words of clause (3); the one footnote, to clause (4): "Ins. by the Constitution (Twenty-fourth Amendment) Act, 1971, s. 2 (w.e.f. 5-11-1971)"

S2 Supreme Court of India, Pradeep Kumar Biswas v. Indian Institute of Chemical Biology and Others, Appeal (civil) 992 of 2002, judgment of 16 April 2002, text on Indian Kanoon (the majority judgment of Ruma Pal, J. and the opening of the dissent of Lahoti, J.). https://indiankanoon.org/doc/471272/

Date; Bench of seven judges; majority judgment by Ruma Pal, J.; dissent by Lahoti, J. for himself and Doraiswamy Raju, J.; CSIR "well within the range of Article 12"; "Sabhajit Tewary's decision must be and is in the circumstances overruled". Its account of the earlier cases, with their citations as the judgment prints them, (1967) 3 SCR 377, (1975) 1 SCC 421, (1979) 3 SCC 489 and (1981) 1 SCC 722: Rajasthan Electricity Board v. Mohan Lal, "all constitutional or statutory authorities on whom powers are conferred by law", and the refusal to apply ejusdem generis; Sukhdev Singh v. Bhagatram, ONGC, LIC and IFC as statutory corporations that are "authorities", and Mathew, J., "A state is an abstract entity. It can only act through the instrumentality or agency of natural or juridical persons"; Ramana Dayaram Shetty, "really an agency of the Government", the International Airport Authority as a statutory corporation; Ajay Hasia, a society registered under the Jammu and Kashmir Registration of Societies Act, 1898, which ran a college (the Regional Engineering College, Srinagar) and was held to be an authority within Article 12, and the six tests (share capital, financial assistance, monopoly status "which is State conferred or State protected", "deep and pervasive State control", functions "of public importance and closely related to governmental functions", transfer of a department of Government). "That an 'inclusive' definition is generally not exhaustive is a statement of the obvious". The restated test: "are not a rigid set of principles"; "financially, functionally and administratively dominated by or under the control of the Government"; "must be particular to the body in question and must be pervasive"; "when the control is merely regulatory whether under statute or otherwise, it would not serve to make the body a State"

S3 Supreme Court of India, Zee Telefilms Ltd. and Another v. Union of India and Others, Writ Petition (civil) 541 of 2004, judgment of 2 February 2005, the opinion of Santosh Hegde, J., text on Indian Kanoon. https://indiankanoon.org/doc/404603/

Date; the five judges named (N. Santosh Hegde, S.N. Variava, B.P. Singh, H.K. Sema and S.B. Sinha, JJ.); "Board is not created by a statute"; "No part of the share capital of the Board is held by the Government"; "Practically no financial assistance is given by the Government to meet the whole or entire expenditure of the Board"; "The Board does enjoy a monopoly status in the field of cricket but such status is not State conferred or State protected"; "There is no existence of a deep and pervasive State control"; "Such limited control is purely regulatory control and nothing more"; "The Board is not created by transfer of a Government owned corporation. It is an autonomous body"; "the second respondent-Board cannot be held to be a State for the purpose of Article 12"; "this writ petition filed under Article 32 of the Constitution is not maintainable and the same is dismissed"; selection of an Indian cricket team, "akin to public duties or State functions"; remedy under the ordinary course of law or by a writ petition under Article 226, "which is much wider than Article 32"; the ratio of the seven-Judge Bench in Pradeep Kumar Biswas "which is binding on this Bench"; disagreement with the opinion of Sinha, J.

S4 Supreme Court of India, Zee Telefilms Ltd. and Another v. Union of India and Others, judgment of 2 February 2005, the opinion of S.B. Sinha, J. (the page names S.N. Variava and S.B. Sinha, JJ.), text on Indian Kanoon. https://indiankanoon.org/doc/1404189/

The opposite view of Sinha, J.: the functions of the Board "would be public functions", and "A body discharging public functions and exercising monopoly power would also be an authority"; the passage quoted from Pradeep Kumar Biswas that a definition using "includes" is generally not exhaustive; the Board as a registered society

S5 Supreme Court of India, Rupa Ashok Hurra v. Ashok Hurra and Another, Writ Petition (civil) 509 of 1997 and connected petitions, judgment of 10 April 2002, the concurring opinion of Umesh C. Banerjee, J., text on Indian Kanoon. https://indiankanoon.org/doc/1201968/

Date; the issue (a petition under Article 32 against matters already concluded by decisions of the Supreme Court); Naresh Shridhar Mirajkar as a decision of a nine-Judge Bench, and "judicial orders passed by High Courts in or in relation to proceedings pending before them" not being open to correction under Article 32; A.R. Antulay as holding, in reliance on Mirajkar, that judicial proceedings in the Supreme Court are not subject to the writ jurisdiction under Article 32, and "the superior court can always correct its own error brought to its notice"; "curative petitions ought to be treated as a rarity rather than regular"

S6 Supreme Court of India, Kaushal Kishor v. State of Uttar Pradesh and Others, judgment of 3 January 2023, the Court's own file (its text was read up to paragraph 63). https://api.sci.gov.in/supremecourt/2016/27156/27156_2016_3_1501_40744_Judgement_03-Jan-2023.pdf

Date; paragraph 46, the question "whether a fundamental right under Article 19 or 21 can be claimed against anyone other than the State"; paragraph 47, "Wherever Constitutional rights impact even the relations between private individuals, they are said to have 'a horizontal effect'"

S7 Supreme Court of India, Kaushal Kishor v. State of Uttar Pradesh, judgment of 3 January 2023, text on Indian Kanoon, view of the passages of the judgment that contain the words "other than the State or its instrumentalities". https://indiankanoon.org/docfragment/103640961/?formInput=%22other%20than%20the%20State%20or%20its%20instrumentalities%22

The wording of the question: "Can a fundamental right under Article 19 or 21 of the Constitution of India be claimed other than against the 'State' or its instrumentalities?"; the answer: "A fundamental right under Article 19/21 can be enforced even against persons other than the State or its instrumentalities."

S8 Supreme Court of India, A.K. Gopalan v. The State of Madras, judgment of 19 May 1950, 1950 AIR 27, 1950 SCR 88, text on Indian Kanoon (headnote and the opinion of Kania, C.J.). https://indiankanoon.org/doc/1857950/

Date and citations; headnote: the Preventive Detention Act, 1950, "with the exception of Sec. 14 thereof", did not contravene the Constitution, and "as this section was severable from the remaining sections of the Act, the invalidity of Sec. 14 did not affect the validity of the Act as a whole"; Kania, C.J.: "The inclusion of article 13 (1) and (2) in the Constitution appears to be a matter of abundant caution. Even in their absence, if any of the fundamental rights was infringed by any legislative enactment, the Court has always the power to declare the enactment, to the extent it transgresses the limits, invalid"

S9 Supreme Court of India, Bhikaji Narain Dhakras and Others v. The State of Madhya Pradesh and Another, judgment of 29 September 1955, 1955 AIR 781, 1955 SCR (2) 589, text on Indian Kanoon. https://indiankanoon.org/doc/762155/

Date and citations; judgment delivered by Das, Acting C.J.; the C.P. and Berar Motor Vehicles (Amendment) Act, 1947, under which the Provincial Government could take up motor transport to the exclusion of private operators; inconsistency with Article 19(1)(g); the First Amendment, 1951 (Article 19(6)) and the Fourth Amendment, 1955 (Article 31); "The true position is that the impugned law became, as it were, eclipsed, for the time being, by the fundamental right"; the First Amendment's effect "was to remove the shadow and to make the impugned Act free from all blemish or infirmity"; "Such laws were not dead for all purposes"; "They existed for the purposes of pre-Constitution rights and liabilities and they remained operative, even after the Constitution, as against non-citizens"; "It is only as against the citizens that they remained in a dormant or moribund condition"

S10 Supreme Court of India, Basheshar Nath v. The Commissioner of Income-Tax, Delhi and Rajasthan and Another, judgment of 19 November 1958, 1959 AIR 149, 1959 SCR Supl. (1) 528, text on Indian Kanoon. https://indiankanoon.org/doc/761967/

Date and citations; Bench of five judges (S.R. Das, C.J., Bhagwati, S.K. Das, Kapur and Subba Rao, JJ.); the settlement of 1954 under section 8A of the Taxation on Income (Investigation Commission) Act, 1947; section 5(1) of that Act, which the Court had declared void in the earlier case of M. Ct. Muthiah for offending Article 14; the appeal allowed and the plea of waiver rejected; Das, C.J. (with Kapur, J.): "We, therefore, confine our attention to Art. 14" and "no person can, by any act or conduct, relieve the State of the solemn obligation imposed on it by the Constitution"; Bhagwati, J.: "it is not open to a citizen to waive the fundamental rights conferred by Part III of the Constitution"; S.K. Das, J. (headnote): "The true test must be whether the fundamental right is one primarily meant for the benefit of individuals"

S11 Supreme Court of India, Keshavan Madhava Menon v. The State of Bombay, judgment of 22 January 1951, 1951 AIR 128, 1951 SCR 228, text on Indian Kanoon. https://indiankanoon.org/doc/656658/

Date and citations; seven judges; majority judgment by Das, J., a separate concurring judgment by Mahajan, J., and the dissent of Fazl Ali, J. with Mukherjea, J. (five to two); the pamphlet of September 1949 and the prosecution under the Indian Press (Emergency Powers) Act, 1931, pending when the Constitution came into force; "can have no retrospective effect but is wholly prospective in its operation"; Article 13(1) "does not in terms make the existing laws which are inconsistent with the fundamental rights void ab initio"; "the exercise of fundamental rights on and after the date of the commencement of the Constitution"; "There is no fundamental right that a person shall not be prosecuted and punished for an offence"; the appeal dismissed

S12 Supreme Court of India, I.R. Coelho (Dead) by LRs v. State of Tamil Nadu and Others, Appeal (civil) 1344-45 of 1976, judgment of 11 January 2007 (nine judges, judgment by Y.K. Sabharwal, C.J.I.), text on Indian Kanoon. https://indiankanoon.org/doc/322504/

Its account of the earlier cases: Sri Sankari Prasad Singh Deo v. Union of India, (1952) SCR 89, the challenge to the First Amendment of 1951, “Article 13(2) does not affect amendments to the Constitution made under Article 368”, “such amendments are made in the exercise of constituent power”; Sajjan Singh, (1965) 1 SCR 933, “the law declared in Sankari Prasad was reiterated”; Golak Nath, (1967) 2 SCR 762, eleven judges, majority of six to five, “the constitutional amendment is ‘law’ within the meaning of Article 13 of the Constitution”, “the Parliament will have no power from the date of the decision (27th February, 1967)”, amendments already made left undisturbed; the Twenty-fourth Amendment Act, 1971, inserting Article 13(4), and words on the exercise of Parliament’s “constituent powers” in Article 368(1); Kesavananda Bharati, “rendered on 24th April, 1973 by a 13 Judges Bench”, “by majority of seven to six Golak Nath’s case was overruled”, “The Constitution (24th Amendment) Act, 1971 was held to be valid”, Article 368 not enabling Parliament to “alter the basic structure or framework of the Constitution”

S13 Earlier topics of this programme, read for consistency: Topic 42, “Salient features of the Constitution” (its sources include the official text in S1 and NCERT, https://ncert.nic.in/textbook/pdf/keps207.pdf); Topic 53, “The Preamble: key words and how the courts have read it” (its sources include Kesavananda Bharati v. State of Kerala, https://indiankanoon.org/doc/257876/)

Topic 42: Part III, Articles 12 to 35; the official text “as on 1st May, 2024”; a law that takes away or abridges a Fundamental Right is void to the extent of the contravention (Article 13); the High Courts under Article 226; the Panchayats (Part IX) and the Municipalities (Part IXA) as local bodies; the commencement of the Constitution on 26 January 1950. Topic 53: Kesavananda Bharati decided on 24 April 1973 by 13 judges; the basic structure as the limit on amendment

S14 Supreme Court of India, Rupa Ashok Hurra v. Ashok Hurra and Another, Writ Petition (civil) 509 of 1997 and connected petitions, judgment of 10 April 2002, the main judgment by Syed Shah Mohammed Quadri, J., text on Indian Kanoon. https://indiankanoon.org/doc/123456797/

Bench of five judges (S.P. Bharucha, C.J.I., S.S.M. Quadri, U.C. Banerjee, S.N. Variava and S.V. Patil, JJ.); the question, whether a person is entitled to any relief “against a final judgment/order of this Court, after dismissal of review petition”, under Article 32 or otherwise; “no judicial order passed by any superior court in judicial proceedings can be said to violate any of the fundamental rights enshrined in Part III”; “the superior courts of justice do not also fall within the ambit of State or other authorities under Article 12 of the Constitution”; Naresh Shridhar Mirajkar as a decision of nine judges, “Eight of the learned Judges took the view that a judicial order cannot be said to contravene fundamental rights of the petitioners”; A.R. Antulay as a decision of seven judges, by a majority of 5 : 2; a final judgment or order of the Supreme Court “cannot be assailed in an application under Article 32”; the curative petition and its conditions

S15 Government of India, India Code, The General Clauses Act, 1897, section 3(31). https://www.indiacode.nic.in/bitstream/123456789/2328/1/189710.pdf

The definition: “local authority” shall mean “a municipal committee, district board, body of port commissioners or other authority” legally entitled to, or entrusted by the Government with, “the control or management of a municipal or local fund”

S16 Supreme Court of India, Supreme Court Employees’ Welfare Association v. Union of India, 24 July 1989, particularly pp. 42–44. https://api.sci.gov.in/jonew/judis/7885.pdf

Court service rules under Article 146(2) remain subject to constitutional principles, including Articles 14 and 16

S17 Supreme Court of India, judgment of 6 May 2020, discussion of Prem Chand Garg and A.R. Antulay. https://api.sci.gov.in/supremecourt/2019/14882/14882_2019_32_1506_21962_Judgement_06-May-2020.pdf

Rule-making under Article 145 cannot infringe Fundamental Rights; distinction from a fresh Article 32 challenge to a judicial order

S18 Supreme Court of India, Gulshan Kumar v. Institute of Banking Personnel Selection, 3 February 2025, paragraph 18. https://api.sci.gov.in/supremecourt/2022/36255/36255_2022_13_1501_59064_Judgement_03-Feb-2025.pdf

Kaushal Kishor's 4:1 majority and enforcement of Articles 19 and 21 against private entities in the examination-accommodation context

S19 Supreme Court of India, R.M.D. Chamarbaugwalla v. Union of India, 9 April 1957. https://api.sci.gov.in/jonew/judis/653.pdf

Leading severability tests: legislative intention, separability and independent operation

Topic 63 Agricultural inputs: seeds, fertilisers and farm mechanisation

English

1. Concept in one line

Seeds, fertilisers and farm machinery are the inputs a farmer buys to get more from each hectare, and India is still short of quality seed, of balance in fertiliser use and of machines on small farms. The exam asks for the law, body or scheme behind each input with its year, and for the dated figures: the N:P:K ratio, the price of the urea bag, the import position and the level of mechanisation.

2. Revision notes

2.1 Why inputs matter

- Topic 55 showed small holdings (1.08 hectares on average in 2015-16) and low yields. A farmer with little land can raise output mainly by getting more from each hectare, and that depends on the inputs used.
- The Economic Survey 2025-26 counts “limited access to irrigation and quality inputs” and “low levels of mechanisation and investment” among the problems of the sector.

2.2 Seeds: quality seed, the law and the agencies

- **Quality seed is short.** The Economic Survey 2025-26 says: “A key factor limiting crop productivity is the limited availability of quality seeds.” Many farmers still depend on older varieties or on farm-saved seed (seed kept back from their own crop), and access to certified seed is limited.
- **Seed replacement rate (SRR):** the percentage of a crop’s area in a season that is sown with certified or quality seed instead of farm-saved seed.
- **Classes of seed:** the basic multiplication chain is nucleus → breeder → foundation → certified seed. The producer examples below are not exclusive monopolies; qualified public and private agencies can participate under the relevant standards.

Class of seed	What it is	Who produces it
Nucleus seed	The small quantity of seed that the plant breeder holds	The plant breeder
Breeder seed	Produced from nucleus seed under the supervision of a qualified plant breeder; a joint inspection team monitors it. Golden-yellow tag	A research institute or an agricultural university
Foundation seed	The progeny of breeder seed; the certification agency supervises and approves its production. White tag	Public and private producers, including the National and State Seeds Corporations and agricultural universities

Class of seed	What it is	Who produces it
Certified seed	The progeny of foundation seed, with the same supervision and approval. Azure-blue tag	The State and National Seeds Corporations and private seed companies, on the farms of progressive growers

- **Truthfully labelled (TL) seed:** seed marketed on the producer's own label and responsibility rather than with certification by the seed certification agency. The label must accurately state the prescribed particulars and the seed must meet applicable quality standards. Under the Seeds Act framework, certification is voluntary; prescribed labelling is compulsory for sale of seed of notified kinds and varieties. TL seed is not a later generation after certified seed.
- **The laws:** the Seeds Act, 1966; varieties are "notified" under it. The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001 provides a system to protect plant varieties and the rights of farmers and plant breeders, and to encourage the development of new varieties. Its Authority is under the Ministry of Agriculture and Farmers Welfare.
- **National Seeds Corporation (NSC):** established in March 1963 "to undertake production of foundation and certified seeds". It is a Schedule 'B' Miniratna Category-I company, wholly owned by the Government of India.
- **High yielding seed and two schemes:** the Survey calls "climate-resilient high-yielding variety seeds" imperative for better yields. The Sub-Mission on Seeds and Planting Materials (SMSP) was launched in 2014-15. The National Mission on High-Yielding Seeds was announced in the Union Budget 2025-26; one of its aims is the commercial availability of more than 100 new seed varieties.

2.3 The Draft Seeds Bill 2025

- The Ministry of Agriculture and Farmers Welfare released the draft in November 2025 and invited comments up to 11 December 2025. It is meant to replace the Seeds Act, 1966.

Feature	What the draft says
Registration of varieties	Registration is mandatory for the sale of seed of any variety. Farmers' varieties and varieties meant for export are exempt. Varieties notified under the 1966 Act are deemed to be registered
Traceability	Every seed container carries its details and a QR code generated through a Centralised Seed Traceability Portal

- **Where it stands:** a Lok Sabha reply of 10 March 2026 says that the draft remained under pre-legislative consultation and stakeholder suggestions were being examined. A Rajya Sabha reply of 6 February 2026 describes safeguards for farmers to grow, save, re-sow, use, exchange and sell farm-saved seed, and exemptions from penalties for seed produced on their own holdings. These are draft provisions, not proof of a new Act being in force. Enactment and commencement must be checked separately; an announced plan to table a Bill does not change the existing law.

2.4 Genetically modified (GM) seed

- A GM crop carries a gene put into it from another organism. Bt brinjal, for example, carries a gene from Bacillus thuringiensis.

- **Who appraises it:** the Genetic Engineering Appraisal Committee (GEAC). It is chaired by a senior officer of the Ministry of Environment, Forest and Climate Change. It is constituted under the Rules of 1989, which were notified under the Environment (Protection) Act, 1986. Until 2010 its name was the Genetic Engineering Approval Committee.

Crop	What it is	Position, with date
Bt cotton	Developed against the bollworm pest	GEAC approved it for commercial cultivation in 2002. It was still the only GM crop so approved on 6 August 2024 (reply in the Lok Sabha)
Bt brinjal	Developed by Mahyco and partner institutions to resist an insect pest	GEAC cleared it in 2009. On 9 February 2010, Environment Minister Jairam Ramesh announced a moratorium on its release, pending adequate independent safety evidence. A moratorium is a hold, not commercial approval; the Lok Sabha reply of 15 September 2020 reported no commercialisation
GM mustard (DMH-11)	A genetically engineered mustard hybrid from the Centre for Genetic Manipulation of Crop Plants, University of Delhi South Campus	GEAC recommended environmental release on 18 October 2022; the Union approved it conditionally on 25 October 2022 for seed production and testing before commercial release. On 23 July 2024, the Supreme Court delivered a split verdict on this approval and referred the disputed issue to an appropriate Bench

- **The 2024 split verdict:** Justice B.V. Nagarathna held the 2022 approval invalid; Justice Sanjay Karol upheld it. The joint order directed the Union to develop a national GM-crop policy after consultation, and to place the disagreement before the Chief Justice for an appropriate Bench. A split verdict is not a final majority judgment either cancelling or confirming the approval. The 2022 permission was not permission for unrestricted commercial cultivation. No later final resolution is asserted here; recheck a current court order before the exam.

2.5 Fertilisers: nutrients, ratio and supply

- **Three primary nutrients:** nitrogen (N), phosphorus (P) and potassium (K).
- **Main fertilisers:** urea is the main nitrogenous fertiliser. The phosphatic and potassic (P&K) fertilisers include di-ammonium phosphate (DAP), single super phosphate (SSP), muriate of potash (MOP) and the NPK complex fertilisers, which are sold by grade (for example 10-26-26, 12-32-16 and 14-28-14).
- **Nutrient content:** a grade is written in the order N, P_2O_5, K_2O, as percentages by weight: phosphorus is counted as phosphate (P_2O_5) and potassium as potash (K_2O). A

fourth figure, where one is given, is sulphur (S). So 10-26-26 has 10 per cent N, 26 per cent P2O5 and 26 per cent K2O.

Fertiliser: Urea

- **Nitrogen (N):** 46 per cent
- **Phosphate (P2O5):** None
- **Potash (K2O):** None
- **Remarks; grade as printed in the Department of Fertilizers' subsidy table for kharif 2026:** It carries nitrogen only

Fertiliser: DAP

- **Nitrogen (N):** 18 per cent
- **Phosphate (P2O5):** 46 per cent
- **Potash (K2O):** None
- **Remarks; grade as printed in the Department of Fertilizers' subsidy table for kharif 2026:** Grade 18-46-0-0

Fertiliser: SSP

- **Nitrogen (N):** None
- **Phosphate (P2O5):** 16 per cent
- **Potash (K2O):** None
- **Remarks; grade as printed in the Department of Fertilizers' subsidy table for kharif 2026:** The specified subsidised grade is 0-16-0-11, including 11 per cent sulphur. General agronomy tables may give a 16–18 per cent range; use the stated 16 per cent grade for this table and Q1

Fertiliser: MOP

- **Nitrogen (N):** None
- **Phosphate (P2O5):** None
- **Potash (K2O):** 60 per cent
- **Remarks; grade as printed in the Department of Fertilizers' subsidy table for kharif 2026:** Grade 0-0-60-0
- **The N:P:K ratio** compares the nitrogen, phosphorus and potassium used in a year. The Economic Survey 2025-26 says the agronomic benchmark for most crops and soils is "closer to 4:2:1".

Year	N:P:K ratio in use (Economic Survey 2025-26)
Benchmark	Closer to 4:2:1
2009-10	4:3.2:1
2019-20	7:2.8:1
2023-24	About 10.9:4.1:1

- The ratio has moved further from the benchmark: against each unit of potassium, nitrogen use has gone up from 4 units to about 10.9. The Survey blames price distortions that favour nitrogenous fertilisers; urea has become the dominant source of nutrients.

Fertiliser	Supply position (note of the Press Information Bureau, PIB, 3 August 2025)
Urea	Around 87 per cent of consumption is met from domestic production, so roughly 13 per cent is imported
DAP	Only about 40 per cent comes from local production; about 60 per cent is imported
MOP	100 per cent is imported
NPK complex fertilisers	About 90 per cent is produced within the country

2.6 Fertilisers: price, subsidy and measures

- **Urea:** it is sold at a "statutorily notified Maximum Retail Price" (MRP). The MRP of the 45 kg bag is Rs 242, exclusive of the charges for neem coating and of taxes (reply of the Department of Fertilizers, Ministry of Chemicals and Fertilizers, in the Lok Sabha, 2 February 2024). This price has not changed since March 2018.
- **Nutrient Based Subsidy (NBS):** in force from 1 April 2010 for P&K fertilisers. A fixed subsidy is set for each product according to its nutrient content, once or twice a year. The companies fix the MRP and the Government monitors it.

Measure	When	What it does
Neem coated urea	Neem coating was made mandatory in 2015 for all subsidised agricultural-grade urea	The coating slows the release of nitrogen, so about 10 per cent less urea is needed. It also reduced diversion and misuse
Soil Health Card	Launched in 2015. Over 25.55 crore cards had been issued as of 14 November 2025	A printed report for each holding of a farmer. It tests 12 parameters, among them N, P, K, pH and organic carbon, and guidance is given every 2 years
One Nation One Fertiliser	In force when the PIB note of 3 August 2025 was written	A single brand name, "Bharat", for all subsidised fertilisers: Bharat Urea, Bharat DAP and Bharat NPK
PM-PRANAM	Part of the package for farmers announced on 28 June 2023	Full form: PM Programme for Restoration, Awareness Generation, Nourishment and Amelioration of Mother Earth. It rewards States that cut the use of chemical fertilisers below their past levels, and promotes organic manure, biofertilisers and compost

Measure	When	What it does
Pradhan Mantri Kisan Samriddhi Kendras (PMKSKs)	About one lakh had come up by 28 June 2023	Fertiliser retail shops turned into one-stop centres: Bharat brand fertilisers, soil testing, hiring of equipment and advice. Nano urea and nano DAP are sold through them; a pilot project for nano urea was running in 100 districts in August 2025

- **Nano urea (liquid):** developed by IFFCO; its specification was notified under the Fertiliser (Control) Order, 1985 on 24 February 2021.
- **Nano DAP:** IFFCO and Coromandel International Limited (CIL) products were notified under the Fertiliser (Control) Order, 1985 on 2 March 2023; IFFCO's Nano DAP (Liquid) was launched on 26 April 2023. Notification and product launch are different dates.
- **Biofertilisers** contain living micro-organisms that make nutrients available, for example by fixing nitrogen. Integrated nutrient management means using chemical fertilisers together with organic manures and biofertilisers.
- **Organic farming:** the Paramparagat Krishi Vikas Yojana (PKVY) covers all States and Union Territories except the North East, which has the Mission Organic Value Chain Development for North Eastern Region (MOVCDNER).

2.7 Farm mechanisation

Measure	Figure	Source and date
Level of mechanisation	47 per cent of agricultural activities are mechanised	Parliament's Standing Committee on Agriculture, Animal Husbandry and Food Processing, report presented on 21 July 2023; the figure is as of August 2022
Farm power availability	2.5 kW per hectare on average; the Committee wants 4 kW per hectare by 2030	The same report

- **Why it is low:** small and marginal holdings are 86 per cent of all holdings (Topic 55), and a small farm can seldom pay for a costly machine of its own. So the schemes help farmers to hire machines.
- **Sub-Mission on Agricultural Mechanisation (SMAM):** launched in 2014-15 by the Ministry of Agriculture and Farmers Welfare. In September 2022 it was merged with the Rashtriya Krishi Vikas Yojana (RKVY, launched in 2007), and it now runs as a centrally sponsored scheme under RKVY. The Centre and most States share the cost 60:40; the ratio is 90:10 for the North-Eastern and Himalayan States.
- **What SMAM pays for:** 40 per cent of the cost of a machine for general beneficiaries and 50 per cent for Scheduled Caste, Scheduled Tribe, small and marginal farmers and for beneficiaries in the North-Eastern States; also training, demonstrations, testing of machines and drones.
- **Custom Hiring Centres (CHCs):** "units comprising a set of farm machinery, implements, and equipment meant for hiring by farmers". From 2014-15 to 2025-26

SMAM supported 27,554 CHCs and 25,608 Farm Machinery Banks, and helped individual farmers buy 21.61 lakh machines (PIB note of 9 July 2026).

- **Crop residue:** SMAM also promotes machines for crop residue management. A separate central sector scheme on crop residue management, implemented since 2018-19, subsidises such machines and custom hiring centres for Punjab, Haryana, Uttar Pradesh and the National Capital Territory of Delhi, against air pollution from stubble burning (reply in the Rajya Sabha, 16 March 2023).
- **Namo Drone Didi:** a central sector scheme approved by the Union Cabinet (PIB release of 29 November 2023), to provide drones to 15,000 selected women's self-help groups during 2023-24 to 2025-26. The outlay is Rs 1,261 crore for 2024-25 and 2025-26; central assistance is 80 per cent of the cost of a drone and its accessories, up to Rs 8 lakh. The Drone Didis are linked to the PMKSKs to deliver services (PIB note of 3 August 2025).

Covered on other days: irrigation (Topic 74), minimum support prices (Topic 84), the Green Revolution (Topic 185), agricultural credit (Topic 274), crop insurance (Topic 363), agricultural marketing (Topic 443) and the fertiliser subsidy in detail (Topic 864).

3. Extra section: a chronology of the policy on farm inputs, 1963 to 2026

Year	What happened
March 1963	The National Seeds Corporation was established
1966	The Seeds Act, the law that the Draft Seeds Bill 2025 is meant to replace
1989	Rules under which GEAC is constituted (notified under the Environment (Protection) Act, 1986)
2002	GEAC approved Bt cotton for commercial cultivation
2007	The Rashtriya Krishi Vikas Yojana was launched
2009	GEAC cleared Bt brinjal
9 February 2010	Environment Minister Jairam Ramesh announced the Bt brinjal moratorium
2010	GEAC was renamed the Genetic Engineering Appraisal Committee
1 April 2010	The Nutrient Based Subsidy began for P&K fertilisers
2014-15	The Sub-Mission on Seeds and Planting Materials and the Sub-Mission on Agricultural Mechanisation were launched
2015	Neem coating of urea was made mandatory; the Soil Health Card was launched
March 2018	The MRP of the 45 kg bag of urea has stood at Rs 242 since this month
September 2022	SMAM was merged with RKVY

Year	What happened
18 and 25 October 2022	GEAC recommended, and the Union conditionally approved, environmental release of GM mustard (DMH-11) for seed production and testing
2 March and 26 April 2023	Nano DAP notification; then launch of IFFCO Nano DAP
23 July 2024	Supreme Court split on the GM-mustard approval; disagreement referred for consideration by an appropriate Bench
2023	PM-PRANAM came in the package for farmers announced on 28 June; the Standing Committee's report on farm mechanisation was presented on 21 July
6 August 2024	The Government told the Lok Sabha that Bt cotton was the only GM crop approved for commercial cultivation
2025	The National Mission on High-Yielding Seeds was announced in the Union Budget 2025-26; the Draft Seeds Bill 2025 was released in November, with comments invited up to 11 December
10 March 2026	The Government told the Lok Sabha that suggestions on the draft Seeds Bill were being examined in pre-legislative consultation

4. Three common exam traps

1. **Putting urea under the Nutrient Based Subsidy.** The NBS is for the phosphatic and potassic fertilisers; there the company fixes the price and the Government only monitors it. Urea stands outside it: its maximum retail price is notified by statute, at Rs 242 for a 45 kg bag, and that figure leaves out the charges for neem coating and taxes. Note also who answers for fertilisers: the Department of Fertilizers is in the Ministry of Chemicals and Fertilizers, not in the Ministry of Agriculture.
2. **Reading "environmental release" as "commercial cultivation".** The conditional GM-mustard permission of 2022 concerned seed production and testing, and the Supreme Court split on its validity in July 2024. Bt brinjal faced the 2010 moratorium. Neither event can be described as unrestricted commercial approval. The Government identified Bt cotton as the only commercially approved GM crop in its Lok Sabha reply of 6 August 2024. GEAC means Genetic Engineering Appraisal Committee and is in the Environment Ministry.
3. **Mixing up the mechanisation figures, and taking a draft for a law.** 47 per cent is the share of agricultural activities that are mechanised (as of August 2022). 2.5 is the farm power available, in kW per hectare. 4 kW per hectare is only a target for 2030. In the same way, the Draft Seeds Bill 2025 is a draft: a draft or even passage of a Bill is not the same as an Act having received assent and commenced.

7. Sources

7.1 Sources

S1 Government of India, *Economic Survey 2025-26*, Chapter 6, "Agriculture and Food Management: Raising Productivity, Securing Incomes and Ensuring Food Security" (paras 6.2, 6.13, 6.19, 6.20, 6.22, 6.26, 6.47, 6.48 and Box VI.4). https://www.indiabudget.gov.in/economicsurvey/doc/eschapter/echap06.pdf

"Limited access to irrigation and quality inputs" and "low levels of mechanisation and investment"; limited availability of quality seeds; reliance on older varieties and farm-saved seed, limited access to certified seed; climate-resilient high-yielding variety seeds; Sub-Mission on Seeds and Planting Materials (launched in 2014-15); National Mission on High-Yielding Seeds (Union Budget 2025-26, more than 100 new varieties); N:P:K ratio in 2009-10, 2019-20 and 2023-24 and the benchmark closer to 4:2:1; price distortions favouring nitrogenous fertilisers, urea as the dominant nutrient source; neem coated urea reduced diversion and misuse; 25.55 crore Soil Health Cards as of 14 November 2025; integrated nutrient management; PKVY and MOVCDNER

S2 Press Information Bureau, backgrounder "Amrit Kaal: Empowering India's Farmers Through Strategic Fertilizer Policy", 3 August 2025. https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/aug/doc202583598601.pdf

Urea at Rs 242 for a 45 kg bag, unchanged since March 2018; around 87 per cent of urea consumption met domestically; about 40 per cent of DAP from local production; MOP 100 per cent imported; 90 per cent of NPK produced within the country; Nutrient Based Subsidy from 1 April 2010 for P&K fertilisers including DAP and NPKS grades; neem coated urea slowing the release of nitrogen, about ten per cent less needed; nano urea and nano DAP sold at PMKSKs, pilot project for nano urea in 100 districts; One Nation One Fertiliser and the "Bharat" brand; purpose of PM-PRANAM; Soil Health Card as a printed report for each holding, 12 parameters, guidance every 2 years; the Namo Drone Didi programme, and Drone Didis linked to PMKSKs

S3 Lok Sabha, Unstarred Question No. 27, "Import of Fertilizers", answered on 2 February 2024 by the Ministry of Chemicals and Fertilizers (Department of Fertilizers).
https://eparlib.nic.in/bitstream/123456789/2974019/1/AU27.pdf

Urea provided at a statutorily notified MRP; Rs 242 for the 45 kg bag, exclusive of charges for neem coating and taxes; Nutrient Based Subsidy with effect from 1 April 2010 for P&K fertilisers, fixed subsidy by nutrient content on an annual or semi-annual basis, MRP fixed by companies and monitored by the Government; NPK grades 10-26-26, 12-32-16 and 14-28-14

S4 IAS Gyan, "Fertilizer sector: challenges and way forward" (undated; a coaching website's summary that links PIB notes). A secondary source. https://www.iasgyan.in/daily-current-affairs/fertilizer-sector-challenges-and-way-forward

Nitrogen, phosphorus and potassium as the primary nutrients; neem coating mandatory in 2015 for all subsidised agricultural-grade urea; Soil Health Card launched in 2015; PMKSKs as one-stop centres (Bharat brand fertilisers, soil testing, hiring of equipment, advice); DAP import dependence of 60 per cent; biofertilisers as living micro-organisms that fix nitrogen

S5 PRS Legislative Research, *Monthly Policy Review*, November 2025, item on the Draft Seeds Bill, 2025.
https://prsindia.org/policy/monthly-policy-review/november-2025

Draft released by the Ministry of Agriculture and Farmers Welfare; comments up to 11 December 2025; intended to replace the Seeds Act, 1966; mandatory registration of varieties, exemptions, varieties notified under the 1966 Act deemed registered; QR code and Centralised Seed Traceability Portal

S6 Business Standard, topic page "Seeds" (list of dated news reports; page dated 9 October 2026).
https://www.business-standard.com/topic/seeds

Draft Seeds Bill 2025 released (report of 13 November 2025); Agriculture Secretary on bringing the Bill in the Budget session (report of 7 January 2026); Agriculture Minister Chouhan on the seed law being likely to be tabled in the next session of Parliament (report of 24 April 2026)

S7 Tamil Nadu Agricultural University, TNAU Agritech Portal, "Seed: concepts".
https://agritech.tnau.ac.in/seed/seedconcepts.html

Definition of seed replacement rate; State Seed Corporations (with the National Seeds Corporation) as public sector producers of quality seed

S8 National Seeds Corporation Limited, official website, home page (seen on 10 October 2026). https://www.indiaseeds.com/

Established in March 1963 to undertake production of foundation and certified seeds; Schedule ‘B’ Miniratna Category-I company wholly owned by the Government of India

S9 IAS Gyan, “SC verdict on GM mustard” (undated; a coaching website’s summary of a report in The Hindu, thehindu.com article 68438360). A secondary source. https://iasgyan.in/daily-current-affairs/sc-verdict-on-gm-mustard

Bt brinjal carries a gene from Bacillus thuringiensis; GEAC: chaired by an officer of the Ministry of Environment, Forest and Climate Change, constituted under the Rules of 1989 under the Environment (Protection) Act, 1986, renamed in 2010

S10 Press Information Bureau, “Cultivation of Genetically Modified crops”, reply of the Ministry of Agriculture and Farmers Welfare in the Lok Sabha, 6 August 2024. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2042234

Bt cotton approved in 2002 by GEAC, of the Ministry of Environment, Forest and Climate Change, for commercial cultivation; the only GM crop so approved

S11 Press Information Bureau, backgrounder “Sub-Mission on Agricultural Mechanization: Enhancing Productivity through Farm Mechanization”, 9 July 2026. https://static.pib.gov.in/WriteReadData/specificdocs/documents/2026/jul/doc202679916301.pdf

SMAM launched in 2014-15; a centrally sponsored scheme under RKVY; cost sharing of 60:40 and 90:10; 40 per cent of machine cost for general beneficiaries and 50 per cent for SC, ST, small and marginal farmers and beneficiaries in the North-Eastern States; training, demonstrations, testing and drones; definition of custom hiring centres; 27,554 CHCs, 25,608 Farm Machinery Banks and 21.61 lakh machines from 2014-15 to 2025-26; crop residue management through mechanisation; RKVY launched in 2007

S12 PRS Legislative Research, summary of the report “Research and Development in Farm Mechanisation for Small and Marginal Farmers in the Country” of the Standing Committee on Agriculture, Animal Husbandry and Food Processing, presented on 21 July 2023. https://prsindia.org/policy/report-summaries/farm-mechanisation-for-small-and-marginal-farmers

47 per cent of agricultural activities mechanised as of August 2022; farm power availability of 2.5 kW per hectare, 4 kW per hectare by 2030; SMAM since 2014-15 and its merger with RKVY in September 2022; small and marginal holdings 86 per cent of all holdings

S13 Food and Agriculture Organization of the United Nations (FAO), Plant Production and Protection Division, “Fertilizer Specifications”. https://fao.org/agriculture/crops/thematic-sitemap/theme/spi/plantnutrition/fertspecs/en

NPK content written in the sequence N, P2O5, K2O; urea: nitrogen minimum 46 per cent; DAP: nitrogen minimum 18 per cent and phosphate (as P2O5) minimum 46 per cent; MOP: potash (as K2O) minimum 60 per cent; SSP: phosphate (as P2O5) and 11 per cent sulphur, no nitrogen or potash

S14 Tamil Nadu Agricultural University, TNAU Agritech Portal, “Nutrient Management: Price of Fertilizers”, which reproduces the Nutrient Based Subsidy table of the Department of Fertilizers for kharif 2026 (1 April to 30 September 2026; updated as on 29 September 2026). https://agritech.tnau.ac.in/agriculture/agri_nutrientmgt_priceoffertilizers.html

Grades in the order N-P-K-S: DAP 18-46-0-0, MOP 0-0-60-0, SSP 0-16-0-11, NPK 10-26-26-0; urea 46.0

S15 Kerala Agricultural University, *Package of Practices Recommendations: Crops*, 14th edition, 2011, Appendix 2, “Average nutrient content of common manures and fertilizers”. https://pop.kau.in/appendices_2-9.htm

Urea 46.0 per cent N; single superphosphate printed there as 18.0 per cent P2O5

S16 Tamil Nadu Agricultural University, TNAU Agritech Portal, “Seed Technology”, page on seed multiplication. https://agritech.tnau.ac.in/seed_certification/seed%20tech%20agri%20index/seedmultiplication.html

Nucleus, breeder, foundation and certified seed: what each is, who produces it, who supervises it and the colour of its tag; truthful labelling compulsory for notified kinds and varieties

S17 Protection of Plant Varieties and Farmers' Rights Authority, Ministry of Agriculture and Farmers Welfare, official website, home page. https://plantauthority.gov.in/

Purpose of the PPV&FR Act, 2001: protection of plant varieties, the rights of farmers and plant breeders, development of new varieties; the Authority under the Ministry of Agriculture and Farmers Welfare

S18 PRS Legislative Research, Session Track, "Monsoon Session 2026: Bills and legislation". https://prsindia.org/sessiontrack/monsoon-session-2026/bill-legislation

Bills introduced in the Monsoon Session of 2026 (20 July to 13 August 2026); no Seeds Bill among them

S19 Press Information Bureau, "Unique package for farmers announced" (decision of the Cabinet Committee on Economic Affairs), 28 June 2023. https://pib.gov.in/PressReleasePage.aspx?PRID=1935893

PM-PRANAM in the package for farmers, and its full form; MRP of urea Rs 242 for the 45 kg bag; about one lakh PMKSKs already set up

S20 Press Information Bureau, "Study on Cultivation of GM Crops", reply of the Ministry of Agriculture and Farmers Welfare in the Lok Sabha, 15 September 2020. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1654492

Bt cotton: commercial release approved in 2002, resistant to the cotton bollworm; Bt brinjal: developed by Mahyco in collaboration with two agricultural universities and an institute of the Indian Council of Agricultural Research, cleared by GEAC in 2009, a moratorium, no further action on commercialisation; GM mustard DMH-11 developed by Delhi University

S21 Press Information Bureau, "Approval for Genetically Modified Mustard", reply of the Ministry of Agriculture and Farmers Welfare in the Lok Sabha, 7 February 2023. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1897008

Environmental release of GM mustard hybrid DMH-11 at the 147th meeting of GEAC on 18 October 2022, for seed production and testing before commercial release; the matter under adjudication before the Supreme Court

S22 Press Information Bureau, "Genetic Engineering Appraisal Committee (GEAC) invites comments for the proposal on authorisation of Environmental release of Genetically Engineered Mustard", Ministry of Environment, Forest and Climate Change, 6 September 2016. https://www.pib.gov.in/newsite/PrintRelease.aspx?relid=149569

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S23 Press Information Bureau, "Government making efforts to enhance the production of nano urea", reply of the Ministry of Chemicals and Fertilizers in the Lok Sabha, 20 July 2021. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1737239

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S24 Press Information Bureau, "Government of India notifies Nano DAP under Fertilizer Control Order (FCO)", reply of the Ministry of Chemicals and Fertilizers in the Rajya Sabha, 6 August 2024. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2042536

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S25 Press Information Bureau, "Union Home Minister and Minister of Cooperation, Shri Amit Shah launches IFFCO Nano DAP (Liquid) in New Delhi today", Ministry of Cooperation, 26 April 2023. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1919980

Launch of IFFCO's Nano DAP (Liquid) on 26 April 2023

S26 Press Information Bureau, “Cabinet approves Central Sector Scheme for providing Drones to the Women Self Help Groups”, 29 November 2023. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1980683

Drones for 15,000 selected women’s self-help groups during 2023-24 to 2025-26; outlay of Rs 1,261 crore for 2024-25 to 2025-26; central assistance of 80 per cent of the cost of the drone and accessories, up to Rs 8 lakh

S27 Press Information Bureau, “Financial assistance provided to farmers for purchase of crop residue management machinery”, reply of the Ministry of Environment, Forest and Climate Change in the Rajya Sabha, 16 March 2023. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1907681

Central sector scheme on crop residue management, implemented from 2018-19 for Punjab, Haryana, Uttar Pradesh and the NCT of Delhi; subsidy for crop residue management machinery and for custom hiring centres

S28 Supreme Court, Gene Campaign v. Union of India, joint operative order and separate judgments, 23 July 2024. https://api.sci.gov.in/supremecourt/2004/661/661_2004_11_1501_54013_Order_23-Jul-2024.pdf ; https://api.sci.gov.in/supremecourt/2004/661/661_2004_11_1501_54013_Judgement_23-Jul-2024.pdf

Split verdict, conditional environmental-release dates, referral and national-policy directions; not unrestricted commercial release

S29 Ministry of Environment and Forests, PIB, Decision on Commercialisation of Bt Brinjal, 9 February 2010; contemporaneous minister’s consultations release. https://www.pib.gov.in/newsite/erelcontent.aspx?lang=2&reg=48&relid=57727 ; https://www.pib.gov.in/newsite/erelcontent.aspx?lang=2&reg=48&relid=57451

Date, minister and precautionary moratorium

S30 Lok Sabha Unstarred Question 2979, 10 March 2026; Rajya Sabha Unstarred Question 822, 6 February 2026. https://sansad.in/getFile/loksabhaquestions/annex/187/AU2979_dc5M1N.pdf?source=pqals ; https://sansad.in/getFile/annex/270/AU822_5AYAQh.pdf?source=pqars

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S31 Ministry of Agriculture, PIB, Government invites public comments on Draft Seeds Bill 2025, 13 November 2025. https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=2189600&lang=2&reg=48

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S32 National Institute of Agricultural Extension Management (MANAGE), Revised DAESI Study Material, 2nd edition 2026, seed-production and certification sections; TNAU Seed Centre production page. https://www.manage.gov.in/publications/eBooks/Revised%20DAESI%20Study%20Material.pdf ; https://www.agritech.tnau.ac.in/seed_certification/seed%20Centre_Seed%20Productions.html

Voluntary certification, compulsory labelling, producer inspection for TL seed, golden-yellow/white/azure-blue tags, agricultural university foundation-seed production; general SSP range

S33 Ministry of Chemicals and Fertilizers, PIB Parliament reply, August 2025. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2154208&lang=2&reg=48

Nano DAP notifications of 2 March 2023 for IFFCO and CIL

Topic 64 Indian tax system: direct and indirect taxes

English

1. Concept in one line

A tax is a compulsory payment charged by the government under a law, and India's taxes fall into two groups: direct taxes, charged mainly on income and profits, and indirect taxes, charged on goods, services and transactions. The exam asks which tax belongs to which group, which level of government levies it, the law and the board behind it, and the Budget figures for 2025-26 and 2026-27.

2. Revision notes

2.1 Tax, fee, cess and surcharge

- **Tax:** a mandatory financial charge or levy that a government imposes on a person or a legal entity. The payer gets no particular service in return for it.
- **Article 265 of the Constitution:** "No tax shall be levied or collected except by authority of law."
- **Fee:** a payment for a direct benefit or service received from the government. NCERT counts fees for services rendered by the government under non-tax revenue.
- **Cess:** a tax levied for a specific purpose under a law made by Parliament. Example: the Health and Education Cess, which is 4 per cent of income tax including surcharge and has been levied from the financial year 2018-19.
- **Surcharge:** an addition to an existing tax. Article 271 permits Parliament to surcharge the duties and taxes referred to in Articles 269 and 270, **except GST under Article 246A**. The whole proceeds go to the Consolidated Fund of India and are outside the divisible pool shared with States.
- **Not shared with the States:** under Article 270, the taxes of the Union List are levied and collected by the Union and distributed between the Union and the States. Among the things that the same Article keeps out of this sharing are a cess levied for a specific purpose and the surcharge of Article 271.

2.2 Direct and indirect taxes

Point	Direct tax	Indirect tax
Charged on	The income, profits or wealth of a person or a firm	Goods, services and transactions
Who pays it to the government	The person or firm on whom it is charged	The producer, seller or importer
Who bears the burden	Usually the same person who pays it	Usually the buyer, because the tax is passed on in the price
Impact and incidence	Usually on the same person	Usually on different persons

Point	Direct tax	Indirect tax
Link with the payer’s income	It can be fitted to the taxpayer’s own circumstances, so it can be made progressive	A rich buyer and a poor buyer pay the same tax on the same article, so the tax takes a larger part of the poor buyer’s income. NCERT calls it regressive in nature
Examples of Union taxes	Income tax, corporation tax	GST, customs duty, central excise duty
Examples of State taxes	Tax on agricultural income	State GST (SGST); VAT on petrol, diesel and liquor; State excise duty; stamp duty
Board of the Union	Central Board of Direct Taxes (CBDT)	Central Board of Indirect Taxes and Customs (CBIC)

- **Impact** is where a tax first falls: on the person who pays it to the government. **Incidence** is where it finally rests: on the person who really bears the burden. Passing a tax on to someone else is called **shifting**.

2.3 Progressive, proportional and regressive taxes

Type	Meaning	Example
Progressive tax	The effective tax rate rises as the amount taxed rises	Personal income tax: the higher the income, the higher the tax rate (NCERT)
Proportional tax	The effective tax rate stays fixed as the amount taxed rises	NCERT: firms are taxed on a proportional basis, the tax being a fixed proportion of profits
Regressive tax	The effective tax rate falls as the amount taxed rises	NCERT calls indirect taxes regressive in nature

2.4 The main direct taxes of the Union

- **Income tax:** a tax on the income of individuals, firms and others, other than companies. **Corporation tax:** a tax on the income of companies.
- **The law:** for more than six decades both were levied under the Income-tax Act, 1961. The **Income-tax Act, 2025** has replaced it. Parliament passed the Bill on 12 August 2025, the President gave assent on 21 August 2025, and the Act came into force on 1 April 2026.
- **Transition on 1 April 2026:** the Income-tax Act, 2025 applies to tax years beginning on or after that date. The 1961 Act continues to govern income of earlier years and the related returns, assessments and proceedings under the saving provisions. Thus, a return for income earned in FY 2025-26 is still filed for **AY 2026-27 under the 1961 Act**; **Tax Year 2026-27 under the 2025 Act** covers income earned from 1 April 2026 to 31 March 2027. Section 3 defines the tax year by reference to the financial year beginning on 1 April; for a newly started business or source, it may be a shorter period ending on 31 March.
- **Heads of income:** income is placed under five heads: salary, house property, business and profession, capital gains, and other sources. So “capital gains” is a head of income under the income-tax law, not a separate tax law.

- **Minimum alternate tax (MAT):** where applicable to a company, tax is generally the higher of its normal income-tax liability and **14 per cent of book profit**, plus applicable surcharge and cess, under section 206 of the Income-tax Act, 2025. The Finance Act, 2026 received assent on **30 March 2026**; the change applies from **1 April 2026**. No fresh MAT credit accrues under the new Act. Earlier accumulated credit is not simply wiped out: specified carry-forward and set-off rules apply. MAT does not apply to every company without exception; concessional-regime companies and other statutory exclusions must be distinguished. An eligible IFSC company earning solely in convertible foreign exchange has the special 9 per cent rate.
- **Securities transaction tax (STT):** a tax on transactions in listed securities. The Budget counts it under "taxes on income".

2.5 Taxes that have been abolished

Tax	What it was	When it ended
Estate duty	A duty on property passing on death	On agricultural land it was discontinued in 1984. On other property it was abolished for deaths on or after 16 March 1985
Gift tax	A tax on gifts above a fixed value	It is not levied on gifts made on or after 1 October 1998
Wealth tax	A tax on net wealth, under the Wealth-tax Act, 1957	The tax was abolished in 2015, and the Budget papers show it as abolished since 2016-17
Dividend distribution tax (DDT)	A tax on dividends that was collected from the company paying them	Abolition was announced in the Budget on 1 February 2020. DDT ceased for dividends declared, distributed or paid after 31 March 2020; taxation moved to recipients under the applicable rules. The Budget announcement date is not the effective date
"Angel tax"	The popular name of the tax under section 56(2)(viib) of the Income-tax Act, 1961	The Union Budget 2024-25 (July 2024) abolished it for all classes of investors
Equalisation levy	A levy brought in by the Finance Act, 2016 on online advertisement services, at 6 per cent. The Finance Act, 2020 extended it to e-commerce supply and services, at 2 per cent, from 1 April 2020	The 2 per cent levy does not apply to supplies made on or after 1 August 2024. From 1 April 2025 the provisions on the equalisation levy do not apply at all

- NCERT's remark: wealth tax, gift tax and estate duty never brought in a large amount of revenue, and were therefore called "paper taxes".

2.6 The main indirect taxes

- **Goods and Services Tax (GST):** in force from 1 July 2017. The Constitution (101st Amendment) Act, which received the President's assent on 8 September 2016, brought in Article 246A.

- **Taxes that GST took in:** among Union taxes, central excise duty, service tax, central sales tax and cesses such as the Krishi Kalyan Cess and the Swachh Bharat Cess. Among State taxes, VAT or sales tax, entry tax, luxury tax and octroi.

Tax	Levied by	What it covers as on 10 October 2026
Customs duty	Union	Goods imported into India or exported out of it. It was not merged into GST
Central excise duty	Union	Goods manufactured or produced in India. After GST it remains on petroleum crude, high speed diesel, petrol, natural gas and aviation turbine fuel, and on tobacco and tobacco products
VAT or sales tax of the States	States	The sale of the same five petroleum products and of alcoholic liquor for human consumption
State excise duty	States	Alcoholic liquor for human consumption made in the State; also opium, Indian hemp and other narcotics
Stamp duty	Union/States under the constitutional allocation	Union List entry 91 specifies rates for certain documents; State List entry 63 covers rates for other documents. Concurrent List entry 44 concerns stamp duties other than duties or fees collected by judicial stamps, excluding rates. Under Article 268, Union-levied stamp duties are collected and assigned as provided there, including to States within which they are leviable

- NCERT says the five petroleum products have been kept out of GST “for the time being”. Alcoholic liquor for human consumption and electricity are not taxed under GST. Tobacco bears both GST and central excise duty.
- **How GST works:** it is destination-based and generally taxes supply. On an intra-State supply, CGST and SGST (or UTGST where applicable) operate together; inter-State supplies and imports attract IGST under the relevant law. Input tax credit allows eligible tax paid on business inputs to be offset against output tax, reducing cascading. Article 269A governs levy, collection and apportionment of inter-State GST.

2.7 The constitutional scheme in brief

- Article 246 divides the power to make laws, including tax laws, between Parliament and the State Legislatures through the three lists of the Seventh Schedule.

Level	What it taxes (entry number in its list)
Union (Union List)	Income other than agricultural income (82); customs duties, including export duties (83); excise duty on the five petroleum products and on tobacco (84); corporation tax (85)
States (State List)	Land revenue (45); agricultural income (46); lands and buildings (49); excise duty on alcoholic liquor for human consumption (51); sale of the five petroleum products and of alcoholic liquor (54); professions, trades, callings and employments (60); rates of stamp duty on documents other than those in Union List entry 91 (63)
Both the Union and the States	Article 246A gives special GST legislative powers. Parliament alone legislates on GST for inter-State supplies under clause (2); the shared power for other supplies is under clause (1). GST power is not a tax entry in the Concurrent List

- **Ceiling on profession tax (Article 276):** the total that any one person pays to a State, or to any one local authority in it, as tax on professions, trades, callings and employments cannot exceed Rs 2,500 a year. The 60th Amendment (1988) raised this ceiling from Rs 250. (Topic 5 called this tax “professional tax”.)

2.8 Who administers the Union’s taxes

- The Department of Revenue of the Ministry of Finance works under the Secretary (Revenue). It controls all direct and indirect Union taxes through two statutory boards.
- **CBDT:** the levy and collection of all direct taxes. **CBIC:** the levy and collection of GST, customs duty, central excise duties and other indirect taxes.
- Both boards derive their statutory basis from the **Central Boards of Revenue Act, 1963**, which commenced on **1 January 1964**. The indirect-tax board was originally the **Central Board of Excise and Customs (CBEC)**; the Finance Act, 2018 renamed it **CBIC with effect from 29 March 2018**.

2.9 Figures from the Union Budget 2026-27 (presented on 1 February 2026)

Head	Revised estimates 2025-26 (Rs crore)	Budget estimates 2026-27 (Rs crore)
Gross tax revenue	40,77,772	44,04,086
Income tax (taxes on income other than corporation tax; STT is counted here)	13,12,000	14,66,000
Corporation tax	11,09,000	12,31,000
GST receipts shown in the Union Budget	10,46,480	10,19,020
Union excise duties (the Budget’s name for central excise duty)	3,36,550	3,88,910
Customs	2,58,290	2,71,200

Head	Revised estimates 2025-26 (Rs crore)	Budget estimates 2026-27 (Rs crore)
Direct taxes (income tax + corporation tax)	24,21,000	26,97,000

Ratio	Revised estimates 2025-26	Budget estimates 2026-27
Share of direct taxes in gross tax revenue	59.4 per cent	61.2 per cent
Share of all the other taxes (indirect taxes)	40.6 per cent	38.8 per cent
Gross tax revenue as a share of GDP (tax-to-GDP ratio)	11.4 per cent	11.2 per cent
Direct taxes as a share of GDP	6.8 per cent	6.9 per cent
Indirect taxes as a share of GDP	4.6 per cent	4.3 per cent

- The five heads stand in the same order of size in both years: income tax, corporation tax, GST, Union excise duties, customs.
- Shares in gross tax revenue in the budget estimates for 2026-27: income tax 33.3 per cent, corporation tax 28.0, GST 23.1, Union excise duties 8.8 and customs 6.2.
- The GST figure falls in 2026-27 because the GST compensation cess has no entry for that year.
- The ratios are worked out on the GDP printed in the Budget: Rs 357,13,886 crore for 2025-26 and Rs 393,00,393 crore for 2026-27.
- “Rupee comes from” in the Budget for 2026-27: out of every rupee that the Union receives, income tax brings 21 paise, corporation tax 18, GST and other taxes 15, Union excise duties 6 and customs 4. Borrowings and other liabilities bring 24 paise.

2.10 Terms to know

Term	Meaning
Tax base	The amount on which the tax rate is applied
Tax expenditure	The revenue impact of tax incentives such as special tax rates, exemptions, deductions, rebates, deferrals and credits. The Receipt Budget carries a statement of it, and says that such incentives may be seen as an indirect subsidy to the taxpayers who get them
Tax buoyancy	How tax revenue responds to a change in national income: the percentage change in tax revenue for a one per cent change in GDP. It takes in the effect of changes in tax rates and tax laws as well. When it is above one, tax revenue grows faster than GDP
Tax elasticity	The same response with the tax law held unchanged: only the built-in growth of revenue as income grows, without the effect of new tax measures

Term	Meaning
Pigovian tax	A tax on a good that harms others (a negative externality). It is named after the economist Arthur Pigou, who wrote “The Economics of Welfare” (1920)
Laffer curve	The idea that raising tax rates beyond a certain point becomes counterproductive: tax revenue rises up to that point and falls when the rate is raised beyond it
General Anti-Avoidance Rule (GAAR)	A rule in the income-tax law, in effect from 1 April 2017. It is aimed at arrangements whose main purpose is to obtain a tax benefit
Tax avoidance and tax evasion	Tax avoidance is reducing the tax payable by lawful use of the tax rules. Tax evasion is illegal. GAAR (the row above) is aimed, as its name says, at avoidance

3. Extra section: a timeline of the tax system, 1944 to 2026

Date	What happened
1944	Central Excise Act: the law on excise duty on goods manufactured or produced in India
1957	Wealth-tax Act
1961	Income-tax Act, 1961, the law that lasted more than six decades
1963; 1 January 1964	Central Boards of Revenue Act enacted; it commenced on 1 January 1964, providing the statutory basis for CBDT and CBEC
1984	Estate duty on agricultural land discontinued
16 March 1985	Estate duty on other property abolished for deaths on or after this date
1988	60th Amendment: ceiling on profession tax raised from Rs 250 to Rs 2,500 a year
1 October 1998	Gift tax not levied on gifts made on or after this date
2015	Wealth tax abolished (the Budget papers show it as abolished since 2016-17)
2016	Finance Act, 2016 brings in the equalisation levy on online advertisement services
8 September 2016	President’s assent to the Constitution (101st Amendment) Act, which brought in Article 246A
1 April 2017	GAAR takes effect
1 July 2017	GST comes into force
29 March 2018	CBEC renamed CBIC through the Finance Act, 2018
2018-19	Health and Education Cess of 4 per cent begins

Date	What happened
1 February; 1 April 2020	Budget announces DDT abolition; dividends declared, distributed or paid from 1 April 2020 fall outside DDT
July 2024	Union Budget 2024-25 abolishes the “angel tax” for all classes of investors
1 April 2025	The provisions on the equalisation levy stop applying
12 August 2025	Parliament passes the Income-tax Bill
21 August 2025	President’s assent: it becomes the Income-tax Act, 2025
1 February; 30 March 2026	Budget proposes MAT reform; Finance Act, 2026 receives assent, with the relevant changes effective 1 April 2026
20 March 2026	CBDT notifies the Income-tax Rules, 2026
1 April 2026	Income-tax Act, 2025 comes into force and replaces the Act of 1961

How to use the timeline:

- The older direct taxes went one by one: estate duty first, then gift tax, then wealth tax, then the dividend distribution tax, then the “angel tax”.
- Each of the two big reforms has two dates, the date of assent and the date of coming into force. Learn them as pairs.

4. Three common exam traps

1. **“A direct tax is a tax of the Centre and an indirect tax is a tax of the States.”** The grouping has nothing to do with who levies the tax. It depends on what is taxed and on who bears the burden. The Union levies both kinds: corporation tax is direct and customs duty is indirect. The States also levy both kinds. Keep the two words apart: impact is where the tax first falls, incidence is where it finally rests, and in an indirect tax the two usually fall on different persons.
2. **“GST replaced every indirect tax.”** It did not. Customs duty was not merged into GST. Petroleum crude, high speed diesel, petrol, natural gas and aviation turbine fuel still bear central excise duty and the States’ VAT. Alcoholic liquor for human consumption bears State excise duty and the States’ VAT. Tobacco bears both GST and central excise duty.
3. **Mixing up the date of assent and the date of coming into force.** The 101st Amendment received assent on 8 September 2016, but GST began on 1 July 2017. The Income-tax Act, 2025 received assent on 21 August 2025, but it came into force on 1 April 2026. Note also that the 2025 Act replaced the Act of 1961; it is not an amendment of it. And “capital gains” is a head of income, not a separate tax law.

7. Sources

7.1 Sources

S1 NCERT, *Introductory Macroeconomics* (Class XII), Chapter 5 “Government Budget and the Economy”, Sections 5.1.1, 5.1.2 and 5.2.1, Box 5.1 and Box 5.3, reprint 2026-27. https://ncert.nic.in/textbook/pdf/leec105.pdf

Direct taxes (personal income tax, corporation tax) and indirect taxes (excise, customs, service tax) with NCERT’s descriptions of excise and customs duties; wealth tax, gift tax and estate duty “now abolished” and called “paper taxes”; progressive income taxation; firms taxed on a proportional basis; indirect taxes “regressive in nature”; fees for services rendered as non-tax revenue; GST box: operational from 1 July 2017, assent to the 101st Amendment on 8 September 2016, Article 246A, destination-based tax with input tax credit, taxes subsumed, five petroleum products kept out for the time being, States’ VAT on alcoholic liquor for human consumption, tobacco under both GST and central excise, CGST, UTGST and SGST Acts

S2 Government of India, Ministry of Finance, Union Budget 2026-27, “Budget at a Glance” (February 2026). https://www.indiabudget.gov.in/doc/Budget_at_Glance/budget_at_a_glance.pdf

Gross tax revenue, corporation tax, taxes on income, customs, Union excise duties, GST, CGST and GST compensation cess for the revised estimates 2025-26 and the budget estimates 2026-27; GDP of Rs 357,13,886 crore (2025-26, advance estimates) and Rs 393,00,393 crore (2026-27, 10 per cent higher); chart “Trend in Tax Receipts (% of GDP)” with direct tax, indirect tax and gross tax revenue; “Rupee comes from” shares for 2026-27

S3 Government of India, Ministry of Finance, Receipt Budget 2026-27, “Tax Revenue”. https://www.indiabudget.gov.in/doc/rec/tr.pdf

The same heads in full figures; securities transaction tax (Rs 63,670 crore and Rs 73,700 crore) shown under taxes on income and described as levied on transactions in listed securities; corporation tax as a tax on the income of companies and taxes on income as a tax on the income of individuals, firms and others; wealth tax “abolished since 2016-17”; GST in force from 1 July 2017; Health and Education Cess at 4 per cent of income tax including surcharge from 2018-19; other taxes and taxes of Union territories

S4 Budget 2026-2027, Speech of the Minister of Finance, 1 February 2026 (paragraphs 99, 138, 140, 142 and 143 and the Annexure to Part B). https://www.indiabudget.gov.in/doc/budget_speech.pdf

“The Income Tax Act, 2025 will come into effect from 1st April, 2026”; MAT proposed as a final tax, rate reduced to 14 per cent from 15 per cent, no further credit accumulation from 1 April 2026; the words “future tax years”; buyback proceeds chargeable under the head “Capital Gains”

S5 Central Board of Direct Taxes, press release on the Income-tax Act, 2025 coming into force from 1 April 2026 (Income Tax Department website). https://www.incometaxindia.gov.in/documents/d/guest/press-release-income-tax-act-2025-comes-into-force-from-01-april-2026-pdf

Income-tax Act, 2025 in force from 1 April 2026, replacing the six-decade-old Income-tax Act, 1961; Bill passed by Parliament on 12 August 2025; President’s assent on 21 August 2025; Income-tax Rules, 2026 notified by the CBDT on 20 March 2026

S6 The Constitution of India, Legislative Department, Ministry of Law and Justice, edition “As on May, 2022” (contents pages). https://cdnbbsr.s3waas.gov.in/s380537a945c7aaa788ccfcdf1b99b5d8f/uploads/2023/05/2023050195.pdf

The heading of Article 246A: “Special provision with respect to goods and services tax”

S7 The Constitution of India, Part XII “Finance, Property, Contracts and Suits” (Articles 264 to 300A), copy hosted by the Ministry of External Affairs. https://www.mea.gov.in/Images/pdf1/Part12.pdf

Article 265 (text); Article 266 (Consolidated Fund of India); Article 268 (stamp duties levied by the Union, collected and kept by the States); Article 270 (taxes of the Union List distributed between the Union and the States, except the surcharge of Article 271 and cesses levied for specific purposes); Article 271 (surcharge, whole proceeds to the Consolidated Fund of India); Article 276 (ceiling of Rs 2,500 a year, raised from Rs 250 by the 60th Amendment Act, 1988)

S8 Government of India, Ministry of Finance, Receipts Budget 1999-2000, “Tax Revenue”. https://www.indiabudget.gov.in/budget_archive/ub1999-2000/rb/taxrev.pdf

Estate duty on agricultural land discontinued under the Estate Duty (Amendment) Act, 1984 and on other property abolished for deaths on or after 16 March 1985 under the Estate Duty (Amendment) Act, 1985; gift tax levied on gifts above a fixed value and not levied on gifts made on or after 1 October 1998; Wealth-tax Act, 1957 as a tax on net wealth; Union excise duties levied under the Central Excises Act, 1944; earmarked cesses and the surcharge on income tax not shareable with the States

S9 Budget 2020-2021, Speech of the Minister of Finance, 1 February 2020 (paragraph 116). https://www.indiabudget.gov.in/budget2020-21/doc/Budget_Speech.pdf

Removal of the dividend distribution tax; the classical system, with dividend taxed only in the hands of the recipients at their applicable rate

S10 Ministry of Finance, “Union Budget 2024-25: Key Tax Reforms and Relief Measures”, 25 July 2024 (Press Information Bureau document). https://static.pib.gov.in/WriteReadData/specificdocs/documents/2024/jul/doc2024726355001.pdf

Abolition of the “angel tax” for all classes of investors in the Union Budget 2024-25; section 56(2)(viib) of the Income-tax Act, 1961

S11 Wikipedia, “Tax” (citing Charles E. McLure Jr., “Taxation”, Encyclopaedia Britannica; A. B. Atkinson, 1977; Michael Parkin, *Principles of Microeconomics*; Arthur Pigou, *The Economics of Welfare*, 1920; Fullerton, *The New Palgrave Dictionary of Economics*). https://en.wikipedia.org/wiki/Tax

Definition of a tax; fees as payment for a direct benefit; direct taxes fitted to the taxpayer’s circumstances and indirect taxes levied on transactions; incidence and shifting, and the burden falling on the most inelastic side; definitions of progressive, proportional and regressive taxes; Pigovian tax; Laffer curve

S12 Wikipedia, “Taxation in India” (citing the Constitution of India, Seventh Schedule). https://en.wikipedia.org/wiki/Taxation_in_India

Article 246 and the three lists; Union List entries 82, 83, 84 and 85; State List entries 45, 46, 49, 51, 54, 60 and 63; the five heads of income; the Wealth-tax Act repealed in 2015; customs duty on imports and exports; Central Excise Act, 1944; petroleum products, alcoholic drinks and electricity not taxed under GST; GAAR in effect from 1 April 2017 and its purpose; the tax base of property tax; the full names of the Krishi Kalyan Cess and the Swachh Bharat Cess

S13 Wikipedia, “Ministry of Finance (India)”, section on the Department of Revenue (text taken from the Department’s own description). https://en.wikipedia.org/wiki/Ministry_of_Finance_(India)

Department of Revenue under the Secretary (Revenue); control of direct and indirect Union taxes through two statutory boards; CBDT for direct taxes; CBIC for GST, customs duty, central excise duties and other indirect taxes; the Act of 1963 under which the boards were constituted

S14 Income Tax Department, Government of India, text of the Income-tax Act, 2025, section 3 “Definition of tax year”. https://www.incometaxindia.gov.in/w/section-3-1

“Tax year” as the twelve months period of the financial year commencing on the 1st April

S15 Income Tax Department, Government of India, “Equalisation levy”. https://www.incometaxindia.gov.in/equalisation-levy3

Equalisation levy introduced by the Finance Act, 2016 on online advertisement services, at 6 per cent; extended by the Finance Act, 2020 to e-commerce supply and services at 2 per cent, for supplies made on or after 1 April 2020 but before 1 August 2024; the provisions not applicable with effect from 1 April 2025

S16 Government of India, Ministry of Finance, Receipt Budget 2026-27, Annexure 7, “Statement of Revenue Impact of Tax Incentives under the Central Tax System: Financial Years 2023-24 and 2024-25”. https://www.indiabudget.gov.in/doc/rec/annex7.pdf

Tax incentives or tax preferences (special tax rates, exemptions, deductions, rebates, deferrals and credits), seen as an indirect subsidy to preferred taxpayers and therefore called “tax expenditures”

S17 Department of Revenue, Ministry of Finance, Government of India, home page (text about the Department). https://dor.gov.in/

Department led by the Secretary (Revenue); the two statutory boards, the CBDT and the CBIC; the CBDT for the levy and collection of all direct taxes; GST, customs duty, central excise duties and other indirect taxes under the CBIC; the boards constituted under the Act of 1963

S18 Orbitax, “India Enacts Finance Act 2026”, 1 April 2026 (a tax news summary of the Act). https://orbitax.com/news/country/article/India-Enacts-Finance-Act-2026–61610

Finance Act, 2026 enacted in March 2026; MAT made a final tax, its rate reduced from 15 to 14 per cent, no new credit accumulation from 1 April 2026

S19 Wikipedia, “State List” (the entries of List II of the Seventh Schedule, with the changes made by the 101st Amendment). https://en.wikipedia.org/wiki/State_List

State List entries 45, 46, 49, 51, 54, 60 and 63 in their present wording; entry 53 (taxes on the consumption or sale of electricity)

S20 International Monetary Fund, Paolo Dudine and Joao Tovar Jalles, “How Buoyant is the Tax System? New Evidence from a Large Heterogeneous Panel”, IMF Working Paper WP/17/4, 2017. https://www.imf.org/-/media/Files/Publications/WP/wp1704.ashx

Tax buoyancy as the measure of how tax revenues vary with changes in output, read as the percentage change in revenue for a one per cent change in income; a buoyancy above one means tax revenue increases more than GDP; elasticity is measured keeping tax legislation constant

S21 World Bank, Glossary of Finance and Debt, entry “tax buoyancy” (as reproduced in the UN ESCWA glossary). https://www.unescwa.org/sd-glossary/tax-buoyancy

Tax buoyancy as the total elasticity of the tax system: built-in elasticity plus the elasticity due to discretionary changes in the tax system

S22 Wikipedia, “Tax avoidance” (secondary source). https://en.wikipedia.org/wiki/Tax_avoidance

Tax avoidance as the legal use of the tax regime to reduce the tax payable; not to be confused with tax evasion, which is illegal

S23 Wikipedia, “Laffer curve” (secondary source). https://en.wikipedia.org/wiki/Laffer_curve

The shape of the Laffer curve: tax revenue rises to a maximum at an intermediate rate of taxation and then falls

S24 Legislative Department, Constitution of India, official edition as on 1 May 2024, Articles 246A, 268–271 and Seventh Schedule. https://cdnbbsr.s3waas.gov.in/s380537a945c7aaa788ccfcdf1b99b5d8f/uploads/2024/07/20240716890312078.pdf

Primary verification of Union entries 82–85, State entries, stamp-duty allocation, inter-State GST power and GST exception in Article 271

S25 Gazette of India, Finance Act, 2026, No. 4 of 2026, assent 30 March 2026; Income Tax Department, MAT and AMT, updated for that Act. https://egazette.gov.in/WriteReadData/2026/271439.pdf ; https://www.incometaxindia.gov.in/hi/w/mat-and-amt

Act identity, assent and commencement from Gazette index; section 206 MAT rate, exclusions, IFSC rate and credit transition from Department’s updated explanatory text

S26 Income Tax Department, Objective and scope of the New Act; Income Tax Returns FAQs. https://www.incometax.gov.in/iec/foportal/help/all-topics/e-filing-services/objective-and-scope-new-act ; https://www.incometax.gov.in/iec/foportal/node/11724

Old years continue under the 1961 Act; AY 2026-27 is distinct from Tax Year 2026-27

S27 India Code, Central Boards of Revenue Act, 1963, sections 1–3 and amendment footnotes. https://www.indiacode.nic.in/bitstream/123456789/1500/2/A1963-54.pdf

Commencement on 1 January 1964; CBEC name changed to CBIC by Finance Act 2018, section 160, effective 29 March 2018

S28 Income Tax Department, Income-tax Act 1961, section 115-O. https://www.incometaxindia.gov.in/w/section-115-o-17

DDT applies to dividends declared, distributed or paid up to 31 March 2020, rather than ending on the Budget announcement date

Topic 65 Jet streams

English

1. Concept in one line

A jet stream is a narrow stream of very fast wind, found in most cases near the top of the troposphere. The examination asks for its cause, its types with their latitudes, heights and seasons, and its part in the weather of India.

2. Revision notes

2.1 What a jet stream is

- **NOAA** (the National Oceanic and Atmospheric Administration of the United States): jet streams are “relatively narrow bands of strong wind in the upper levels of the atmosphere”.
- **AMS** (the American Meteorological Society, in its *Glossary of Meteorology*): “relatively strong winds concentrated within a narrow stream in the atmosphere”. The term now usually means a nearly horizontal stream of maximum winds embedded in the westerlies of the middle latitudes, in the high troposphere.
- **Britannica:** a region of long, narrow, high-speed winds in the middle and upper troposphere or the lower stratosphere.
- **NCERT:** the Class 11 chapter on the climate of India (2026-27 printing) speaks of a westerly jet stream and an easterly jet stream, but it does not define the term (see 2.6).

Measure	Figure
Height	Typically around 9,100 m (30,000 feet); it varies from about four to eight miles, that is, from about 6 to 13 km (NOAA). Between 6 and 14 km (Britannica)
Speed	Up to 90 metres per second (324 km per hour) at the centre (Britannica). It can reach more than 442 km per hour (NOAA). On upper-level charts a jet stream is marked where the wind speed equals or exceeds 50 knots, about 93 km per hour (AMS)
Width and depth	Hundreds of miles wide and thousands of feet deep (NOAA): typically a few hundred kilometres wide and often less than 5 km deep (PBS NOVA)

- The winds strengthen towards a central core (NOAA). Their strongest winds are generally near the tropopause, the boundary between the troposphere and the stratosphere (Day 2, Topic 15).
- **Discovery:** Wasaburo Oishi documented strong upper-air currents over Japan with pilot balloons in the 1920s. Aviation during World War II brought much wider awareness of the jet stream. Do not confuse wartime recognition with its first scientific documentation (NOAA Climate.gov).

2.2 Why a jet stream forms

- **Temperature contrast.** A jet stream results from horizontal differences in temperature: the greater the difference, the stronger the jet (Britannica). Jet streams follow the boundaries between hot and cold air (NOAA), that is, between air masses (Day 12, Topic 115).
- **Pressure gradient aloft.** These differences of temperature create a horizontal pressure gradient at that height, and the pressure gradient sets the air moving (Britannica).
- **Coriolis force.** The moving air is turned to the right in the northern hemisphere and to the left in the southern hemisphere (Day 5, Topic 44). NOAA explains the west-to-east flow from the rotation of the earth: air moving towards the pole keeps the eastward momentum it had nearer the equator.
- **Geostrophic wind.** In the free atmosphere, surface friction becomes small. For approximately straight, steady flow, the pressure-gradient and Coriolis forces balance and wind runs parallel to the isobars. This is an idealised balance, not a claim that every part of a curved, changing jet is perfectly geostrophic (NCERT; Day 5).

2.3 The upper-air westerlies and Rossby waves

- In the middle latitudes the westerlies blow in the high troposphere too, and the jet stream is the stream of maximum winds embedded in these upper-air westerlies (AMS).
- In the idealised three-cell diagram, the polar front jet lies near the Polar–Ferrel cell boundary; the subtropical jet lies near the Hadley–Ferrel boundary. The Met Office explains the polar-front contrast and NOAA places the subtropical jet at the edge of the Hadley cell (the cells are those of Day 5).
- Jet streams encircle the earth in meandering paths, so the wind in a jet may blow north-eastward, eastward or south-eastward (Britannica).
- **Rossby waves:** each large meander, or wave, within the jet stream is known as a Rossby wave or planetary wave. Rossby waves are caused by changes in the Coriolis effect with latitude (Rhines, University of Washington; NOAA).
- A jet is not one unbroken ring: the polar front jet is discontinuous and varies greatly from day to day (AMS).
- **Link with the three-cell model:** its arrows describe a simplified north–south overturning circulation. They are not a complete picture of the observed wind. In the middle latitudes, the actual upper-level flow is predominantly westerly; weather-system eddies help maintain the circulation and the jets (NOAA).

2.4 The types of jet streams

IMD below is the India Meteorological Department.

Jet: Polar front jet

- **Latitude:** Usually around 50° to 60° in each hemisphere in NOAA’s introductory account; its actual position varies
- **Height:** About 9 km above sea level. It is generally lower than the subtropical jet; their strengths vary with place and season
- **Season:** Strongest in winter
- **Direction:** From the west

- **What it does:** It is associated with the polar front; a front is the boundary zone between two different air masses (NCERT). The contrast between air masses there promotes the formation of squalls, storms and cyclones (Britannica)

Jet: Subtropical westerly jet

- **Latitude:** Around 30° (NOAA). At some longitudes it lies between 20° and 30°, and it is strongest off the coast of Asia (AMS)
- **Height:** Somewhat higher than the polar front jet
- **Season:** Strongest in winter. Over north India it stays from October or November to early June
- **Direction:** From the west
- **What it does:** It lies above the subtropical high pressure belt and usually goes with fair weather (Britannica). Over north India, however, the winter depressions from the west travel underneath it (see 2.6)

Jet: Tropical easterly jet

- **Latitude:** Near the latitude of Chennai in July (IMD). NCERT says it sets in along 15° N
- **Height:** The 150 hPa level, that is, 150 mb. This is higher than 10 km, where the standard pressure is 265 mb (Day 5)
- **Season:** Summer
- **Direction:** From the east. It runs from the east coast of Vietnam to the west coast of Africa (IMD)
- **What it does:** NCERT holds it responsible for the burst of the monsoon in India

Jet: Polar night jet

- **Latitude:** Near the boundary of the polar night (AMS); the polar night is the long darkness of the polar winter. It lies at around 60° latitude
- **Height:** The upper stratosphere and the mesosphere (AMS)
- **Season:** Autumn and winter
- **Direction:** From the west
- **What it does:** It circles the polar vortex
- **Low-level jets** blow far below all these. The best known is the **Somali jet** (IMD): a low-level current, 1 to 1.5 km above sea level, that crosses the equator and attains jet speed along the east coast of Africa. It originates near Mauritius and the northern part of Madagascar and attains its maximum strength in July. Its strengthening gives rise to a strong monsoon over peninsular India.

2.5 Why the westerly jets are stronger in winter, and how they shift

- The boundaries between hot and cold air are most pronounced in winter. So the principal tropospheric westerly jets are generally strongest in the winter of each hemisphere (NOAA); this does not make the summer tropical easterly jet a winter phenomenon.
- In winter the positions of the jet streams are nearer the equator and their speeds are higher than in summer (Britannica).

- NOAA says that jet streams “follow the sun”: in spring the average latitude of the jet shifts towards the pole, and in autumn it shifts back towards the equator.
- The pressure belts of Day 5 keep the same rhythm: in the northern hemisphere they move southwards in winter and northwards in summer (NCERT).

2.6 Jet streams and the weather of India

NCERT’s Class 11 chapter on the climate of India ties the jet streams to the burst of the monsoon. The detail below is from Glenn Trewartha’s study of the jet stream in Asia (the journal *Erdkunde*, 1958) and from the IMD.

Winter: the westerly jet over north India

- In winter a westerly jet stream lies over the north Indian plain, south of the Himalayas. NCERT speaks of its withdrawal from this position before the monsoon.
- **Two branches (Trewartha):** the Tibetan highland bifurcates the fast westerly air stream in winter. The southern branch wraps itself around the southern flanks of the Himalayas. It is relatively fixed in position and has very high velocities, and Trewartha calls it the subtropical jet. The northern branch flows around the north side of the highland and is weaker than the southern branch. The two branches tend to converge again east of the highland.

Western disturbances

- NCERT (Class 11): shallow cyclonic depressions originate over the east Mediterranean Sea and travel eastwards across West Asia, Iran, Afghanistan and Pakistan to north-western India, where they give rain and snow in winter. NCERT’s Class 9 book calls them western cyclonic disturbances; they are commonly called western disturbances.
- Their tracks lie underneath the jet, to the south of the Himalayas (Trewartha). NCERT itself asks the student what role the westerly jet streams play in steering these depressions.

The withdrawal of the westerly jet and the burst of the monsoon

- NCERT: the shift in the position of the Inter-Tropical Convergence Zone (ITCZ) is related to the withdrawal of the westerly jet stream from the north Indian plain.
- NCERT has two sentences. The first: “The easterly jet stream sets in along 15°N latitude only after the western jet stream has withdrawn itself from the region.” The second: “This easterly jet stream is held responsible for the burst of the monsoon in India.” The “western jet stream” of the first sentence is the westerly jet.
- Trewartha gives the time: in late May and early June the jet disappears completely from south of the highland and flows as a single jet to the north of the mountains. In October and November it reappears rather suddenly south of the Himalayas.

Summer: the tropical easterly jet (IMD)

- The easterly flow concentrates into a jet stream centred near the latitude of Chennai at 150 hPa in July. Its speed over the peninsula is 60 to 80 knots (about 110 to 150 km per hour).
- The winds that flow out of the Tibetan High feed this jet. The Tibetan High is a warm anticyclone that lies over the Tibetan Plateau, in the middle and upper troposphere.
- The mechanism of the monsoon comes on Day 9 (Topic 86).

2.7 Jet streams, flying and the cyclones of the middle latitudes

- **Flying:** airlines try to fly with the jet stream to save fuel and time. A tailwind increases an aircraft's speed over the ground; a headwind reduces it, so flight planning takes the jet's position into account (NOAA).
- **Clear-air turbulence:** the wind motions of a jet stream generate strong vertical shearing action, which is thought to be largely responsible for clear-air turbulence (Britannica).
- **Cyclones of the middle latitudes:** extra tropical cyclones form along the polar front and move from west to east (NCERT), and the polar front jet is associated with the same front (AMS). The path of the jet affects the cyclonic storm systems of the lower levels, so knowing its course is an important part of weather forecasting.
- Air masses and fronts come on Day 12 (Topic 115), cyclones on Day 13 (Topic 125) and El Nino on Day 37 (Topic 365).

3. Extra section: the jets over India through the year (a calendar)

Time of year	What the jets do	What goes with it
Winter	The southern branch of the westerly jet is fixed on the southern flanks of the Himalayas, over the north Indian plain. The northern branch flows north of the Tibetan highland	Shallow cyclonic depressions from the east Mediterranean Sea travel underneath the southern branch and give rain and snow in north-western India
Late May and early June	The westerly jet disappears from south of the highland and flows as a single jet north of the mountains	The ITCZ shifts northwards. The southerly currents surge northwards
After the westerly jet has withdrawn	The easterly jet stream sets in along 15° N	The burst of the monsoon in India, for which NCERT holds this jet responsible
July to September	In July the tropical easterly jet is centred near the latitude of Chennai at 150 hPa, and the Somali jet, 1 to 1.5 km above sea level, is at its maximum strength. In September the easterly jet weakens to less than 50 knots over India	In July the ITCZ lies around 20° N to 25° N over the Gangetic plain. During a break in the monsoon the easterly jet moves northwards, up to 20° N (IMD)
October and November	The westerly jet reappears rather suddenly south of the Himalayas	The south-westerly currents and their disturbances are forced to retreat (Trewartha)

Two pairs to keep apart:

- **The two westerly jets of the troposphere.** The polar front jet is commonly shown around 50° to 60°, with a variable actual position; it is generally the lower of the two and goes with the storms and cyclones of the middle latitudes. The subtropical westerly jet

lies around 30°; it is the higher of the two, and it is the jet that sits south of the Himalayas in winter.

- **The two jets of the monsoon months.** The tropical easterly jet is an upper-level jet, at 150 hPa, and it runs from Vietnam to Africa. It affects the formation and duration of the Indian and African summer monsoons (Britannica), and its location seems to influence the pattern of monsoon rainfall (IMD). The Somali jet is a low-level jet, 1 to 1.5 km above sea level, and it crosses the equator along the east coast of Africa. Both belong to the monsoon months.

4. Three common exam traps

1. **“A jet stream is a broad, steady wind belt like the trade winds.”** It is a narrow core of fast wind inside the upper-air westerlies; it is not a belt of surface winds. It is not a fixed ring either: it meanders, it is broken in places, and it changes its place with the seasons.
2. **“Every jet stream blows from the west.”** A wind is named after the direction it comes from (Day 5). The tropical easterly jet blows from the east, and it is a jet of the summer. Remember also that “jet” does not always mean the upper troposphere: there are low-level jets, and there is a jet of the stratosphere and the mesosphere.
3. **“The westerly jet brings the monsoon to India.”** NCERT’s order is the reverse. The westerly jet first withdraws from the region, and only after that does the easterly jet set in. It is the easterly jet that NCERT holds responsible for the burst of the monsoon. Note NCERT’s wording as well: in one sentence it writes “western jet stream” for the westerly jet.

7. Sources

7.1 Sources

S1 NCERT, *Fundamentals of Physical Geography* (Class XI), Chapter 9, “Atmospheric Circulation and Weather Systems”, reprint 2026-27. https://ncert.nic.in/textbook/pdf/kegy209.pdf

Geostrophic wind: winds 2 to 3 km above the surface free from friction, the pressure gradient force balanced by the Coriolis force, the wind parallel to the isobars; the pressure belts moving southwards in winter and northwards in summer in the northern hemisphere; a front as the boundary zone between two different air masses; extra tropical cyclones forming along the polar front and moving from west to east; the chapter does not use the word “jet”

S2 NCERT, *India: Physical Environment* (Class XI), Chapter 4, “Climate”, 2026-27 printing. https://ncert.nic.in/textbook/pdf/kegy104.pdf

The shift in the position of the ITCZ related to “the withdrawal of the westerly jet stream from its position over the north Indian plain” (under “Onset of the Monsoon”); “The easterly jet stream sets in along 15°N latitude only after the western jet stream has withdrawn itself from the region.”; “This easterly jet stream is held responsible for the burst of the monsoon in India.”; the ITCZ in July around 20°N to 25°N over the Gangetic plain; shallow cyclonic depressions originating over the east Mediterranean Sea and travelling eastwards across West Asia, Iran, Afghanistan and Pakistan to north-western India, with winter rain and snow; the question “What is the role of Westerly Jet Streams in steering these depressions in India?”; the chapter names the jet streams without defining the term

S3 NCERT, *Contemporary India-I* (Class IX), Chapter 4, “Climate”. https://ncert.nic.in/textbook/pdf/iess104.pdf

The name “western cyclonic disturbances” for the winter low-pressure systems that originate over the Mediterranean Sea and western Asia and move into India

S4 NOAA, JetStream, “The Jet Stream” (page updated 9 December 2024). https://www.noaa.gov/jetstream/global/jet-stream

Definition (“relatively narrow bands of strong wind in the upper levels of the atmosphere”); typical height of 30,000 feet (9,100 m) and the range of four to eight miles; jets following the boundaries between hot and cold air, and strongest in winter in both hemispheres; the west-to-east flow explained from the rotation of the earth (air moving towards the pole keeping its eastward momentum) and the Coriolis effect; the polar jet between 50° and 60° and the subtropical jet around 30°; speeds of more than 275 miles per hour (442 km per hour); width of hundreds of miles and height of thousands of feet; winds strengthening towards a central core; jets “following the sun” in spring and autumn

S5 American Meteorological Society, *Glossary of Meteorology*, “jet stream”. https://glossary.ametsoc.org/wiki/Jet_stream

Definition (“Relatively strong winds concentrated within a narrow stream in the atmosphere”); the quasi-horizontal jet of maximum winds embedded in the midlatitude westerlies, in the high troposphere; the polar-front jet stream associated with the polar front, discontinuous and varying greatly from day to day; the subtropical jet stream at some longitudes between 20° and 30° latitude, strongest off the Asian coast; a jet stream marked on upper-level charts where the wind speed equals or exceeds 50 knots

S6 Encyclopaedia Britannica, “jet stream” (introductory article). https://www.britannica.com/science/jet-stream

Definition (long, narrow, high-speed winds flowing north-eastward, eastward and south-eastward in the middle and upper troposphere or lower stratosphere); heights between 6 and 14 km; speeds of up to 90 metres per second at the centre; vertical shearing action thought to be largely responsible for clear-air turbulence; “first discovered by airmen during World War II”; the jet stream resulting from horizontal differences in temperature, stronger with a greater difference; the horizontal pressure gradient; meandering paths around the earth; positions nearer the equator and speeds higher in winter; the polar front jet and the formation of squalls, storms and cyclones; the subtropical jet above the subtropical high pressure belt and fair weather; the tropical easterly jet in summer, affecting the formation and duration of the Indian and African summer monsoons

S7 NOAA Climate.gov and Met Office primary meteorological explanations, with direct sources S11–S14 below; NOAA jet-stream material in S4.

Upper-air structure, cell-boundary relationship, Rossby waves, first documentation and aviation. These supersede the draft’s Wikipedia-based support. The unverified November 1952 flight-time anecdote has been removed; it is not needed for the concept

S8 India Meteorological Department (website), “Frequently asked Questions (FAQs) on Monsoon”. https://mausam.imd.gov.in/imd_latest/monsoonfaq.pdf

The tropical easterly jet: centred near the latitude of Chennai at 150 hPa in July, running from the east coast of Vietnam to the west coast of Africa, 60 to 80 knots over the peninsula, weakening to less than 50 knots over India in September, moving northwards up to 20° N in break monsoon conditions, its location influencing the pattern of monsoon rainfall; the Somali jet: a low-level (1 to 1.5 km above sea level) cross-equatorial flow attaining jet speed along the east coast of Africa, originating near Mauritius and the northern part of Madagascar, maximum strength in July, its strengthening giving a strong monsoon over peninsular India; the Tibetan High as a warm anticyclone over the Tibetan Plateau in the middle and upper troposphere, its outflow concentrating into the easterly jet stream

S9 Glenn T. Trewartha, “Climate as Related to the Jet Stream in the Orient”, *Erdkunde*, volume 12, number 3, 1958, pages 205 to 214. https://www.erdkunde.uni-bonn.de/article/view/1241 ; full text: https://www.erdkunde.uni-bonn.de/article/download/1241/1230/1244

The Tibetan highland bifurcating the high-velocity westerly air stream in winter; the southern branch wrapped around the southern flanks of the Himalayas, relatively fixed in position and with very high velocities; the weaker northern branch; the two converging again east of the highlands; the name “subtropical jet” for the branch south of the Himalayas; winter disturbances following the course of the jet across northern India and Pakistan, with their tracks underneath the jet; the changes of late May and early June, the jet disappearing completely from south of the highlands and flowing as a single jet to the north; the northward surge of the southerly currents; the rather sudden reappearance of the jet south of the Himalaya in October and November; the south-westerlies and their perturbations forced to retreat

S10 American Meteorological Society, *Glossary of Meteorology*, “polar night jet stream”. https://glossary.ametsoc.org/wiki/polar-night-jet-stream/

The polar night jet stream as a core of strong westerly winds that develop during autumn and winter in the upper stratosphere and mesosphere, near the boundary of the polar night

S11 NOAA Climate.gov, Tim Woollings, “What is the jet stream?”, 27 January 2022. https://content-drupal.climate.gov/news-features/blogs/enso/what-jet-stream

Oishi’s 1920s observations; wartime recognition; actual upper westerlies, subtropical jets at the Hadley-cell edge, eddy-driven jets and aviation

S12 UK Met Office, “Global circulation patterns”. https://weather.metoffice.gov.uk/learn-about/weather/atmosphere/global-circulation-patterns

Polar-front jet at the meeting of contrasting air from the Ferrel and Polar cells; replaces the Wikipedia-only basis for Q1 statement 4

S13 P. B. Rhines, “Mesoscale Eddies”, author’s University of Washington copy, discussion of Rossby waves and potential vorticity. https://www.ocean.washington.edu/research/gfd/ap-eddies-gall.pdf ; NOAA, “What is a Rossby wave?” https://oceanservice.noaa.gov/facts/rossby-wave.html

Change of Coriolis effect with latitude; planetary waves and the jet’s large meanders; replaces the Wikipedia-only basis for Q1 statement 3

S14 NOAA, C. Wang, “Atlantic Climate Variability and Its Associated Atmospheric Circulation Cells”, Journal of Climate (2002). https://www.aoml.noaa.gov/phod/docs/wang_jc02_2.pdf

Separates meridional overturning from observed zonal westerly wind maxima near the tropopause; supports the three-cell clarification

Topic 66 Soils of India and Andhra Pradesh

English

1. Concept in one line

Soil is the mixture of rock debris and organic materials that develops on the earth's surface, and NCERT groups the soils of India into eight kinds by their genesis, colour, composition and location. The examination asks you to match each soil with its region, with what it is rich or poor in and with its crops, and to know which soils cover Andhra Pradesh.

2. Revision notes

2.1 How soil forms and how the soils of India are classified

- **Soil-forming factors (NCERT):** relief, parent material (the bed rock), climate, vegetation and other life forms, and time. Human activities also influence soil. A few centimetres of soil take millions of years to form.
- **Eight groups:** the Class XI NCERT book *India: Physical Environment*, in the editions that carried a chapter on soils, classifies the soils of India on the basis of genesis, colour, composition and location into alluvial, black, red and yellow, laterite, arid, saline, peaty and forest soils.
- **Six in Class X:** the 2026-27 reprint of the Class XI book does not carry that chapter. The Class X book, *Contemporary India II*, describes six of the eight groups and leaves out saline and peaty soils.
- **ICAR and the USDA orders:** the same Class XI chapter says the Indian Council of Agricultural Research (ICAR) has classified Indian soils by the orders of the Soil Taxonomy of the United States Department of Agriculture (USDA). Its table, taken from the National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), reads: Inceptisols 39.74 per cent, Entisols 28.08, Alfisols 13.55, Vertisols 8.52, Aridisols 4.28, Ultisols 2.51, Mollisols 0.40 and others 2.92. The chapter does not say which order matches which of the eight groups.
- Note the wording: the chapter names ICAR for the table of orders. It gives the eight groups without saying who made the list.

2.2 The eight soil groups of India (NCERT)

Soil: Alluvial

- **Where it is found:** The northern plains and the river valleys; a narrow corridor through Rajasthan into Gujarat; the deltas of the east coast (Mahanadi, Godavari, Krishna and Kaveri)
- **How it forms:** Deposited by rivers; in the north by the Indus, the Ganga and the Brahmaputra systems
- **Colour, texture and nature:** Light grey to ash grey; sandy loam to clay

- **Rich in and poor in:** Rich in potash; poor in phosphorus (Class XI). The Class X book says these soils mostly contain an adequate proportion of potash, phosphoric acid and lime
- **Crops NCERT names:** Sugarcane, paddy, wheat and pulses

Soil: Black (regur, black cotton soil)

- **Where it is found:** Most of the Deccan Plateau: parts of Maharashtra, Madhya Pradesh, Gujarat, Andhra Pradesh and Tamil Nadu; it extends along the Godavari and Krishna valleys
- **How it forms:** From the lava flows (basalt) of the Deccan Trap
- **Colour, texture and nature:** Deep black to grey; clayey, deep and impermeable
- **Rich in and poor in:** Rich in lime, iron, magnesia, alumina and potash; poor in phosphorus, nitrogen and organic matter
- **Crops NCERT names:** Cotton

Soil: Red and yellow

- **Where it is found:** The eastern and southern parts of the Deccan Plateau; parts of Odisha and Chhattisgarh; the piedmont zone of the Western Ghats
- **How it forms:** On crystalline igneous rocks, in areas of low rainfall
- **Colour, texture and nature:** Red because of iron diffused in crystalline and metamorphic rocks; it looks yellow when hydrated
- **Rich in and poor in:** Poor in nitrogen, phosphorus and humus
- **Crops NCERT names:** None named

Soil: Laterite

- **Where it is found:** Karnataka, Kerala, Tamil Nadu, Madhya Pradesh and the hilly areas of Odisha and Assam
- **How it forms:** Under high temperature and heavy rain. Leaching washes away lime and silica; iron oxide and aluminium compounds are left behind
- **Colour, texture and nature:** Acidic; widely cut as bricks. The name is from the Latin “later”, a brick
- **Rich in and poor in:** Poor in organic matter, nitrogen, phosphate and calcium; iron oxide and potash in excess
- **Crops NCERT names:** Tea and coffee in the hills of Karnataka, Kerala and Tamil Nadu; cashew nut on the red laterite soils of Tamil Nadu, Andhra Pradesh and Kerala

Soil: Arid

- **Where it is found:** Western Rajasthan
- **How it forms:** Under a dry climate with high temperature and fast evaporation
- **Colour, texture and nature:** Red to brown; sandy and generally saline. Layers of kankar in the lower horizons restrict the infiltration of water
- **Rich in and poor in:** Lacks humus and moisture; nitrogen is insufficient, phosphate is normal

- **Crops NCERT names:** Can be cultivated when irrigated

Soil: Saline (usara)

- **Where it is found:** Western Gujarat, the deltas of the east coast and the Sundarbans of West Bengal
- **How it forms:** A dry climate and poor drainage; sea water entering the deltas; over-irrigation
- **Colour, texture and nature:** Sandy to loamy
- **Rich in and poor in:** A larger proportion of sodium, potassium and magnesium; lacks nitrogen and calcium
- **Crops NCERT names:** Infertile; supports no vegetation

Soil: Peaty

- **Where it is found:** Northern Bihar, southern Uttarakhand and the coastal areas of West Bengal, Odisha and Tamil Nadu
- **How it forms:** In areas of heavy rainfall and high humidity, where vegetation grows well
- **Colour, texture and nature:** Heavy and black; alkaline in many places
- **Rich in and poor in:** Organic matter may reach 40 to 50 per cent
- **Crops NCERT names:** None named

Soil: Forest

- **Where it is found:** Hilly and mountainous areas with enough rain for forests
- **How it forms:** In forest areas where rainfall is sufficient
- **Colour, texture and nature:** Loamy and silty on the valley sides; coarse-grained on the upper slopes
- **Rich in and poor in:** In the snow-bound Himalaya, acidic with low humus; fertile in the lower valleys
- **Crops NCERT names:** None named
- **Share of the country's area:** NCERT gives a share for one group only: alluvial soils cover about 40 per cent of the total area of the country.
- **Khadar and bhangar:** both are alluvial. Khadar is the new alluvium that floods deposit every year; it is finer and more fertile. Bhangar is the older alluvium, lying away from the flood plains. Both contain kankar, which are lumps of calcium carbonate; bhangar has more of them.
- **Black soil in the dry season:** it swells and turns sticky when wet, and shrinks and cracks wide open when dry. NCERT calls this "self ploughing". It holds moisture for a very long time, which helps rain-fed crops through the dry season.

2.3 Soil problems in a line each

- **Soil erosion:** the destruction of the soil cover by running water and wind. Deforestation, overgrazing and faulty ploughing speed it up.
- **Salinity and alkalinity:** salts collect in the soil where the climate is dry and the drainage is poor. Over-irrigation in a dry climate sets off capillary action, which leaves

salt on the top layer of the soil. In the deltas, sea water entering the land makes the soil saline.

- **Waterlogging:** over-irrigation has waterlogged land in Punjab, Haryana and western Uttar Pradesh; this in turn increases salinity and alkalinity (NCERT).

2.4 Andhra Pradesh: the soil groups and their shares

- **The State's own count:** the Socio Economic Survey 2018-19 of the Government of Andhra Pradesh counts 22 categories of soil over the total geographical area of the State; six of them are predominant and together cover over 88 per cent. It describes the present State, which then had 13 districts.
- **ICAR's soil atlas:** the Indian Institute of Soil Science of ICAR gives the same count (22 types, six of them covering 88 per cent of the geographical area) and says that red, black and alluvial soils predominate. It speaks of "residual" Andhra Pradesh and carries figures of 2016-17, so it too describes the State as it has been since 2014.
- **Shares in the atlas:** among the types it names are deep reddish-brown soils, loamy to clayey, 20.4 per cent; shallow gravelly red soils, 10.4 per cent; moderately deep calcareous black soils, 9.57 per cent; and deep black clayey soils, 7.7 per cent. These two red types add up to 30.8 per cent and these two black types to 17.27 per cent. They are shares of single types, not totals for all red or all black soils.
- **An older ICAR study:** a study of 1998 by NBSS&LUP, of the State before 2014, calls the soils dominantly gravelly red, black and deltaic alluvial.
- **Broad-group shares, with a date:** NABARD's Andhra Pradesh *State Focus Paper 2025-26* gives red soils about 65 per cent, black 25 per cent, alluvial 5 per cent, coastal sands 3 per cent and laterite 2 per cent. Its *State Focus Paper 2022-23* gives the same five-part breakdown. Thus red soils occupy the largest share. These broad groups differ from the atlas's detailed soil types. Do not use the unsupported shortcut "alluvial 10 per cent", add district percentages together, or present these dated estimates as a new 2026 soil survey.
- **Fertility (atlas):** the pH of the State's soils ranges from 4.2 to 10.2. They are low in available nitrogen and medium to high in phosphorus and potassium.

2.5 Andhra Pradesh: where each soil is found and what grows there

Soil group	Where it is found	Figures and examples	Crops
Red soils	In Rayalaseema and in the coastal districts alike	YSR Kadapa legacy district description: its undated website gives red soils as 53 per cent of the cultivated area, with a low nutrient status. Sri Potti Sriramulu Nellore district (website, undated): red soil is predominant, with 40 per cent of the area. Old Krishna district: red loams 19.4 per cent	Rain-fed groundnut is the predominant crop of YSR Kadapa district, with 52 per cent of the annual cropped area

Soil group	Where it is found	Figures and examples	Crops
Black cotton soils	In the coastal districts and in Rayalaseema; NCERT places black soil along the Godavari and Krishna valleys	Old Krishna district: 57.6 per cent, the largest group there. Nellore district: 23 per cent. YSR Kadapa district: around Muddanur, Jammalamadugu, Proddatur, Mydukur, Pulivendla and Kamalapuram	Cotton, for which NCERT calls black soil ideal
Alluvial soils	The deltas of the Godavari and the Krishna	West Godavari district (website, with data up to 2023-24): deltaic alluvial soils 80.4 per cent	Paddy: the major crop of West Godavari district and the main food crop of Krishna district. Sugarcane is grown in both
Coastal sands	Along the coast	Nellore district: a belt of sand runs along the sea coast	None named
Laterite soils	ICAR's State page describes the soils of the State as "red lateritic and black"; it names no district	No share is given	Cashew nut, on the red laterite soils that NCERT names
Saline and alkali soils	In the deltas of the east coast, where sea water enters (NCERT)	The atlas gives 2.71 lakh hectares in 10 districts	None named; NCERT calls saline soils infertile

- **Main crops of the State (atlas):** paddy, cotton, pulses, groundnut, chickpea, red gram and sugarcane.
- **Delta districts:** Topic 45 (Day 5) gave West Godavari and Dr B.R. Ambedkar Konaseema as the delta districts of the Godavari, and NTR, Guntur, Krishna and Bapatla as the districts along the Krishna from Vijayawada to the sea.
- **Old Krishna district:** the district as it was before 2022, when it was divided into Krishna and NTR districts. The figures are corroborated by NABARD's Krishna PLP 2022-23 and ICRISAT's Rythu Kosam Annual Report 2016-17, which also gives sandy clay loams 22.3 per cent and sandy soils 0.7 per cent. The list has no class called alluvial: it names soils by colour and texture, while "alluvial" says how a soil was laid down.
- **The YSR Kadapa figures do not agree with each other:** a second list on the same website gives red soil as 25 per cent, not 53. The page carries no date.
- **Salt-affected area, a second figure:** ICAR's State page gives 0.81 million hectares (8.1 lakh hectares). That page counts 10.1 million hectares (101 lakh hectares) of cultivated area, far more than the net sown area of the present State, which the atlas puts at about 62.08 lakh hectares. So its figures belong to the State before 2014. For post-2014 Andhra Pradesh, the atlas's dated estimate is 2.71 lakh hectares; it is not a freshly measured 2026 total.

- **District boundaries:** Andhra Pradesh has 28 districts as checked on 10 October 2026 against official State sources. The atlas and the old Krishna figures use earlier boundaries. Do not apply an undated district website's soil or crop percentages automatically to the present district; the Kadapa page, for example, still includes Rayachoty and Rajampet in its description of red-soil areas.
- The physical divisions of the State are Topic 295; world soils are Topic 925.

3. Extra section: soil erosion and salt-affected land, with the remedies NCERT names

Problem	What happens	Where NCERT places it
Sheet erosion	After a heavy shower, water flows as a sheet and carries away the fine, fertile topsoil. It is hard to notice	Level lands
Gully erosion	Running water cuts deep channels, called gullies, and breaks farmland into pieces. Land full of gullies or ravines is called badland	Steep slopes. Ravines are widespread in the Chambal basin, and are also found in Tamil Nadu and West Bengal
Wind erosion	Wind blows loose soil away	Arid and semi-arid regions
Salinity and alkalinity	Salts rise with the water and collect on the surface; fertile alluvial soil turns saline	The over-irrigated Green Revolution areas, the Rann of Kachchh and the deltas
Waterlogging	Over-irrigation leaves water standing in the soil	Punjab, Haryana and western Uttar Pradesh

- The older NCERT chapter gives about 8,000 hectares a year lost to ravines and says about half of India's land is degraded to some degree. These are textbook-era estimates, not a current 2026 land-degradation assessment.

Remedies NCERT names:

- **On slopes:** contour ploughing, which is ploughing along the contour lines, and terrace farming, which is well developed in the western and central Himalayas.
- **For gullies:** terracing removes finger gullies. Check dams slow the water in bigger gullies. Gully plugging stops a gully from growing headward.
- **Against wind:** strip cropping, in which strips of grass are left between the crops, and shelter belts, which are rows of trees. The Central Arid Zone Research Institute (CAZRI) has tried to stabilise sand dunes in western Rajasthan.
- **For salt-affected soils:** NCERT mentions gypsum in Punjab and Haryana. More precisely, ICAR-CSSRI distinguishes gypsum-based reclamation of sodic/alkali soil from drainage and leaching for saline soil. Gypsum is not a universal remedy for every salt-affected field.
- **In general:** contour bunding, regulated forestry, controlled grazing, cover cropping, mixed farming and crop rotation.

In Andhra Pradesh, ICAR's atlas gives 48.40 lakh hectares where water erosion removes more than 10 tonnes of soil per hectare each year, and 58.70 lakh hectares of degraded land and wasteland.

4. Three common exam traps

1. **Khadar and bhangar the wrong way round.** Khadar is the new alluvium, renewed by the floods every year. Bhangar is the old alluvium, away from the flood plains. Both are alluvial soils and both carry kankar. “Bhangar is more fertile because it is older” is wrong: khadar is the finer and the more fertile of the two.
2. **“Black soil is black, so it must be rich in humus.”** NCERT says black soil lacks organic matter, nitrogen and phosphorus. What it has plenty of is lime, iron, magnesia, alumina and potash. Peaty soil is the one with 40 to 50 per cent organic matter. Forest soil is not always rich in humus either: in the snow-bound Himalaya it is acidic with low humus.
3. **Two lists and two classifications.** The older Class XI NCERT book has eight groups; the Class X book has six, without saline and peaty soils. The USDA orders are a different classification altogether. “Inceptisols, 39.74 per cent” and “alluvial soils, about 40 per cent” are two separate facts; do not treat the one as the other.

7. Sources

7.1 Sources

S1 NCERT, *Contemporary India II* (Class X), Chapter 1, “Resources and Development”, reprint 2026-27. https://ncert.nic.in/textbook/pdf/jess101.pdf

A few centimetres of soil take millions of years; the soil-forming factors; six soil groups (alluvial, black, red and yellow, laterite, arid, forest); alluvial soil of the Indus, Ganga and Brahmaputra systems, the corridor through Rajasthan and Gujarat and the deltas of the Mahanadi, the Godavari, the Krishna and the Kaveri on the eastern coast; bangar with more kankar, khadar finer and more fertile; an adequate proportion of potash, phosphoric acid and lime in alluvial soils; sugarcane, paddy, wheat and pulses; black soil as regur, ideal for cotton, from the Deccan Trap lava flows, along the Godavari and Krishna valleys; red colour from iron diffused in crystalline and metamorphic rocks, yellow when hydrated; laterite from the Latin “later”, leaching, acidic, tea and coffee, cashew nut on the red laterite soils of Tamil Nadu, Andhra Pradesh and Kerala; arid soil, dry climate and evaporation, kankar layers and infiltration, cultivable with irrigation; forest soil; deforestation, overgrazing and faulty ploughing; gullies, bad land, ravines of the Chambal basin, sheet erosion, wind erosion, contour ploughing, terrace farming in the western and central Himalayas, strip cropping, shelter belts; over-irrigation, waterlogging, salinity and alkalinity in Punjab, Haryana and western Uttar Pradesh

S2 NCERT, *India: Physical Environment* (Class XI), reprint 2026-27: the contents page and Chapter 6, “Natural Hazards and Disasters”. https://ncert.nic.in/textbook/pdf/kegy1ps.pdf and https://ncert.nic.in/textbook/pdf/kegy106.pdf

The 2026-27 reprint has six chapters and none on soils; its Chapter 6 is “Natural Hazards and Disasters”

S3 NCERT, *India: Physical Environment* (Class XI), the chapter “Soils” of the earlier printings (first edition 2006), which the 2026-27 reprint no longer carries; read in the file that NCERT still keeps at its older address. https://ncert.nic.in/ncerts/l/kegy106.pdf

Definition of soil; the soil-forming factors; the eight groups on the basis of genesis, colour, composition and location, with no author named for the list; the ICAR table of USDA Soil Taxonomy orders with its percentages, from NBSS&LUP; alluvial soils about 40 per cent, sandy loam to clay, rich in potash and poor in phosphorus, khadar and bhangar, kankar, light grey to ash grey; black soil over the Deccan Plateau and its States, clayey, deep and impermeable, self ploughing, moisture, rich in lime, iron, magnesia, alumina and potash, poor in phosphorus, nitrogen and organic matter, deep black to grey; red and yellow soils, their places, the diffusion of iron, poor in nitrogen, phosphorus and humus; laterite, lime and silica leached, iron oxide and aluminium compounds, nutrients, States, bricks, cashew nut; arid soils, kankar layers, nitrogen and phosphate, western Rajasthan; saline (usara) soils, their salts, texture, places and causes, capillary action, gypsum; peaty soils; forest soils; sheet and gully erosion, badland, ravines in the Chambal basin, Tamil Nadu and West Bengal, 8,000 hectares, half the land degraded; terracing, check dams, gully plugging, the general conservation measures and CAZRI

S4 ICAR-Indian Institute of Soil Science, e-Atlas, page 34 (Andhra Pradesh). https://iiss.icar.gov.in/e-Atlas/files/basic-html/page34.html

Red, black and alluvial soils predominant; 22 soil types, six covering 88 per cent of the geographical area; shares of the named red and black types; “residual” Andhra Pradesh; pH 4.2 to 10.2; low available nitrogen, medium to high phosphorus and potassium; 58.70 lakh hectares of degraded land and wasteland; 48.40 lakh hectares of water erosion above 10 tonnes per hectare per year; 2.71 lakh hectares of saline and alkali soils in 10 districts; net sown area of about 62.08 lakh hectares; major crops; foodgrain figures of 2016-17 on the same page

S5 Indian Council of Agricultural Research, State page “Andhra Pradesh”. https://icar.org.in/en/node/17257

Soils “red lateritic and black with low fertility and salinity problem”; 0.81 million hectares of salt-affected soils; cultivated area of 10.1 million hectares, given as 37 per cent of the geographical area

S6 Government of Andhra Pradesh, *Socio Economic Survey 2018-19*, Chapter 5, “Agriculture and Allied Activities” (soil types). https://apfinance.gov.in/uploads/index-docs/SocioEconomicalSurvey2018-19.pdf

22 categories of soils adding up to the total geographical area of the State; six predominant types together covering over 88 per cent; a State of 13 districts

S7 Government of Andhra Pradesh, YSR Kadapa district website, “Natural Crops”. https://kadapa.ap.gov.in/district-produce/produce-in-ysr-district/

Red soils 53 per cent of the cultivated area of the district, with a low nutrient status; the second list, with red soil at 25 per cent; black soils around Muddanur, Jammalamadugu, Proddatur, Mydukur, Pulivendla and Kamalapuram; rain-fed groundnut on 52 per cent of the annual cropped area

S8 NABARD, *Krishna PLP 2022-23*, chapter 2.1.1, and ICRISAT, *Rythu Kosam Annual Report 2016-17*, p. 30 (direct links in S14). Krishna official district history: https://krishna.ap.gov.in/

Soil shares for the pre-2022 district; sandy-soil share; 2022 district split. These primary institutional sources replace the draft’s Wikipedia citation

S9 Government of Andhra Pradesh, West Godavari district website, “Agriculture”. https://westgodavari.ap.gov.in/departments/agriculture/

Deltaic alluvial soils 80.4 per cent in the soil table of the district; paddy the major crop in both seasons and sugarcane the second crop of kharif; land-use data up to 2023-24

S10 Government of Andhra Pradesh, Sri Potti Sriramulu Nellore district website, “District Profile”. https://spsnellore.ap.gov.in/nellore-district-profile/

Red soil predominant with 40 per cent of the area of the district; black cotton soil 23 per cent; a belt of sand along the sea coast

S11 L. G. K. Naidu and others (ICAR-National Bureau of Soil Survey and Land Use Planning), “Mapping of agro-ecological zones of Andhra Pradesh through soil-resource data”, *The Indian Journal of Agricultural Sciences*, volume 68, number 10, 1998 (abstract). https://epubs.icar.org.in/index.php/IJAgS/article/view/27745

Soils dominantly gravelly red, black and deltaic alluvial

S12 Government of Andhra Pradesh, YSR Kadapa official district site. https://kadapa.ap.gov.in/about-district/ ; soil/crop page in S7.

Official district context; legacy place names on the soil page must not be treated as a current district-boundary inventory

S13 NABARD, *Andhra Pradesh State Focus Paper 2025-26*, printed p. 18, “Soil”. https://www.nabard.org/auth/writereaddata/tender/pub_2208250520151800.pdf ; *State Focus Paper 2022-23*, State Profile and section 1.4. https://www.nabard.org/auth/writereaddata/tender/1603224529SFP_Andhra_Pradesh.pdf

Broad soil shares: red 65%, black 25%, alluvial 5%, coastal sands 3%, laterite 2%; dated post-2014 State context

S14 NABARD, *Krishna Potential Linked Credit Plan 2022-23*, chapter 2.1.1. https://www.nabard.org/auth/writereaddata/tender/0312215843ap-krishna.pdf ; ICRISAT, *Rythu Kosam Annual Report 2016-17*, p. 30. https://idc.icrisat.org/idc/wp-content/uploads/2017/10/2017-May-18-RK-Annual-Report-2016-17-.pdf

Independent primary institutional confirmation of the old Krishna district's soil proportions; replaces the Wikipedia-only factual basis for Q2 statement 2

S15 Andhra Pradesh State Disaster Management Authority, TRINETRA heat-wave analysis, 2026. https://apsdmagis.ap.gov.in/heatwave/analysis.html ; YSR Kadapa official "About District". https://kadapa.ap.gov.in/about-district/

Current 28-district administrative configuration, independently checked for this topic

S16 ICAR-Central Soil Salinity Research Institute, "About Institute" and "Technology". https://cssri.res.in/about-institute/ ; https://cssri.res.in/technology-new/

Distinction between gypsum treatment of sodic/alkali soil and drainage-based reclamation of saline soil

Topic 67 Cybersecurity: threat types, CERT-In, named policies and cybercrime-response mechanisms

English

1. Concept in one line

Cyber security means protecting information, devices and computer resources from unauthorised access, use, disclosure, disruption, modification or destruction. The examination asks you to tell the kinds of malware and attack apart, and to match each Indian institution, portal, policy and section of law with its job.

2. Revision notes

2.1 What cyber security means

- **In law:** section 2(1)(nb) of the Information Technology Act, 2000 defines cyber security as protecting information, equipment, devices, computers, computer resources and communication devices from “unauthorised access, use, disclosure, disruption, modification or destruction” (as in Topic 27).
- **Confidentiality:** to ensure that information “is not disclosed to unauthorized individuals, entities, or processes” (glossary of the National Institute of Standards and Technology, NIST, of the United States).
- **Integrity:** to ensure that information is not modified or destroyed without authority.
- **Availability:** to ensure “timely and reliable access to and use of information” (NIST).
- These are the three goals of cyber security. The Digital Personal Data Protection Act, 2023 uses the same three words when it defines a personal data breach (Topic 30).
- **Cyber crime (NCERT):** “Criminal activities or offences carried out in a digital environment”. Cyber crimes and the Information Technology Act come in detail on a later day.

2.2 Malware and its kinds

Malware is short for “MALicious softWARE” (NCERT): software made to damage hardware, steal data or cause other trouble.

Kind	What it does (NCERT)	Remember
Virus	Malicious code that inserts itself into a host program and replicates through infected hosts	It becomes active when the infected host runs; a fresh manual click is not essential in every case (NIST). Fred Cohen's own account dates his experiment to November 1983 and credits Leonard Adleman with suggesting the name; NCERT's "1985" should not be used as the historical date
Worm	A standalone program. It needs no host program. It replicates on its own and can spread to other computers through the network	NCERT's examples: Code Red, Nimda, Morris Worm
Trojan	It looks like legitimate software and tricks the user into installing it	It does not self-replicate or infect other files. Some Trojans create backdoors
Ransomware	It blocks the user from accessing their own data, usually by encrypting the data, or threatens to publish the personal data online. It then demands a ransom	WannaCry, in May 2017, "infected almost 200,000 computers across 150 countries"
Spyware	It spies on a person or an organisation by gathering information about them	Remember what it does: it spies and gathers information
Adware	It is created to generate revenue for its developer	"Adware is usually annoying, but harmless", but unsafe advertisement links can let in other malware
Keylogger	It records the keys pressed on the keyboard	It "can either be malware or hardware". On an unknown computer, NCERT advises a virtual keyboard
Bot	Malicious software that an attacker installs on compromised computers, which are called zombies	A network of zombies is a botnet (NCERT writes Bot-Net). It is used for the DDoS attack of section 2.3

- **How malware spreads (NCERT):** downloads from the Internet, spam email, removable storage devices and propagation over a network.

2.3 Other attacks and frauds

Term	Meaning in one line	Remember
Phishing	Fake websites or emails that look original or authentic are presented to the user, to lure the user into revealing sensitive information	The most common method is email spoofing, with a fake or forged email address (NCERT). Phone calls and text messages are also used

Term	Meaning in one line	Remember
Spear phishing	Phishing that targets a specific individual within an organisation (NIST)	When it targets senior executives or leaders, it is called whaling
Vishing	Phishing that uses voice, as in a phone call (NIST)	The channel is voice, not email
Smishing	Phishing that arrives by text message (NIST)	The channel is a text message, not email
Social engineering	Deceiving a person in order to get sensitive information, gain unauthorised access or commit fraud (NIST)	The one who is tricked is a person, not a machine. NIST's example of what is given away: a password
Identity theft	Identity thieves use personal information stolen from computers or computer networks	NCERT's three kinds: financial, criminal and medical. Section 66C of the Information Technology Act is headed "Punishment for identity theft"
Hacking	"the act of unauthorised access to a computer, computer network or any digital system" (NCERT)	White hat hackers are ethical hackers. Black hat hackers are also called crackers. Grey hats hack for the challenge or for fun
Denial of Service (DoS)	Prevents authorised access to a resource or delays its operation (NIST); flooding it with traffic is one common method	It is an attack on availability
Distributed Denial of Service (DDoS)	A denial-of-service attack using numerous hosts (NIST)	NCERT's example is a botnet flooding a target; the hosts need not literally be spread across the globe
Man-in-the-middle (MitM) attack	The attacker is positioned between two communicating parties, to intercept or alter the data travelling between them (NIST)	Compare eavesdropping in the next row, which only intercepts or monitors; here the data can also be altered
Snooping and eavesdropping	Snooping (also called sniffing) is secretly listening to a conversation; the traffic can be stored for later analysis. Eavesdropping is "an unauthorised real-time interception or monitoring of private communication"	Snooping is "not always an attack": network administrators use it for troubleshooting (NCERT)
SQL injection	An attack that makes an application's database execute unintended SQL commands by mishandling input (US-CERT/CISA)	SQL means Structured Query Language; the target is the application–database interaction, not the user's trust

Term	Meaning in one line	Remember
Zero-day attack	An attack that exploits a previously unknown vulnerability in hardware, firmware or software (NIST)	The key words are “previously unknown”
‘Digital arrest’	Cyber criminals impersonate the State or Union Territory Police, the Narcotics Control Bureau (NCB), the Central Bureau of Investigation (CBI), the Reserve Bank of India (RBI) and other law enforcement agencies, and blackmail the victim (the Central Government’s alert)	The Prime Minister spoke about it in “Mann Ki Baat” on 27 October 2024

- A Government backgrounder of 8 October 2025 also names spoofing (criminals posing as trusted sources), deepfakes made with artificial intelligence, and frauds on the Unified Payments Interface (UPI).

2.4 Defences, a line each

Defence	What it does
Firewall	“a network security system designed to protect a trusted private network from unauthorised access” (NCERT). A network firewall sits between two or more networks; a host-based firewall sits on a single computer
Antivirus	Software “also known as anti-malware” (NCERT). Its methods include signature-based detection, sandbox detection, heuristics and real-time protection
Encryption and HTTPS	HTTPS (HyperText Transfer Protocol Secure) “encrypts the data before transmission”, while HTTP “sends information over the network as it is” (Topic 57). NCERT names encryption and authentication as ways to keep sensitive data private
Backup	“A copy of files and programs made to facilitate recovery, if necessary” (NIST). NCERT’s advice: take a regular backup of important data
Multi-factor authentication (MFA)	Authentication that uses two or more different factors (NIST). The three kinds of factor are something you know (a password or PIN), something you have (a token) and something you are (a biometric). NIST’s glossary lists the abbreviation 2FA (two-factor authentication) alongside MFA

2.5 The law in a line (Information Technology Act, 2000)

NCERT notes that the Act of 2000 was amended in 2008.

Section	Heading	Point
43	Penalty and compensation for damage to computer, computer system, etc.	Acts done without the permission of the owner, such as access, downloading, introducing a virus, damage and disruption. The liability is to pay compensation
66	Computer related offences	The acts of section 43, when done dishonestly or fraudulently: imprisonment up to three years, or fine up to Rs 5 lakh, or both
66C	Punishment for identity theft	Fraudulent or dishonest use of another person’s electronic signature, password or other unique identification feature: up to three years and fine up to Rs 1 lakh
66D	Punishment for cheating by personation by using computer resource	Cheating by impersonation through a communication device or computer resource: up to three years and fine up to Rs 1 lakh
66F	Punishment for cyber terrorism	Imprisonment which may extend to imprisonment for life
70	Protected system	The appropriate Government may notify a protected system. Critical Information Infrastructure is a computer resource whose incapacitation or destruction would have a debilitating impact on national security, economy, public health or safety. A contravention: imprisonment up to ten years and fine
70A	National nodal agency	The Central Government may designate an organisation of the Government as the national nodal agency for protecting Critical Information Infrastructure. Inserted with effect from 27 October 2009
70B	Indian Computer Emergency Response Team to serve as national agency for incident response	See section 2.6

2.6 Institutions for cyber security

Body	Parent or legal basis	What it does
Indian Computer Emergency Response Team (CERT-In)	It works under the Ministry of Electronics and Information Technology (MeitY). Under section 70B the Central Government appoints it by notification	The national agency for responding to cyber security incidents. It collects and disseminates information on cyber incidents, gives forecasts and alerts, takes emergency measures, coordinates the response and issues advisories. It handled over 29.44 lakh incidents in 2025
National Critical Information Infrastructure Protection Centre (NCIIPC)	A unit of the National Technical Research Organisation (NTRO). It was created under section 70A by a gazette notification of 16 January 2014	The national nodal agency for the protection of Critical Information Infrastructure, in sectors such as banking, telecom, power and transportation
National Cyber Security Coordinator (NCSC)	Under the National Security Council Secretariat (NSCS)	Ensures coordination among the different agencies
National Cyber Coordination Centre (NCCC)	Implemented by CERT-In	A control room that scans the cyberspace and detects cyber security threats. It shares metadata with the agencies concerned
Cyber Swachhta Kendra (CSK)	A citizen-centric service of CERT-In	The Botnet Cleaning and Malware Analysis Centre. It detects malicious programs and gives free tools to remove them (csk.gov.in)

The directions of 28 April 2022. Section 70B(6) empowers CERT-In to seek information and issue directions. Direction (ii) requires service providers, intermediaries, data centres, bodies corporate and Government organisations to report the cyber incidents listed in Annexure I within **6 hours of noticing them or being informed of them**. It is not a blanket deadline for every citizen complaint. The directions were to take effect after 60 days. They also require clock synchronisation, a designated contact, ICT logs for a rolling 180 days within India, specified customer records for data-centre/VPS/cloud/VPN providers, and KYC/record-keeping for virtual-asset service providers. CERT-In's FAQ permits an initial report using available information, followed by further details within a reasonable time. Under section 70B(7), non-compliance can attract imprisonment up to 1 year, or a fine up to Rs 1 crore, or both; the Jan Vishwas amendment increased the earlier Rs 1 lakh ceiling with effect from 30 November 2023.

2.7 Mechanisms against cyber crime

"Police" and "Public Order" are State subjects under the Seventh Schedule to the Constitution. So the States and Union Territories are primarily responsible for dealing with cyber crime, and the Centre supplements their efforts.

Mechanism	Run by	What it does
Indian Cyber Crime Coordination Centre (I4C)	An attached office of the Ministry of Home Affairs (MHA)	Deals with all types of cyber crime in a coordinated manner
National Cyber Crime Reporting Portal (NCRP), cybercrime.gov.in	A part of I4C	The public reports all types of cyber crime on it, with special focus on crimes against women and children. The State or Union Territory police convert the reports into First Information Reports (FIRs) and take them forward
Helpline 1930	I4C promotes it along with the portal	A toll-free number for help in lodging online complaints of financial fraud
Citizen Financial Cyber Fraud Reporting and Management System	Under I4C; launched in 2021	Immediate reporting of financial frauds, to stop the money from being siphoned off. The Government's backgrounder of 8 October 2025: more than Rs 5,489 crore saved, in over 17.82 lakh complaints
Sanchar Saathi, with its Chakshu facility	Department of Telecommunications (DoT); the mobile app was launched on 17 January 2025	A portal and a mobile app. On Chakshu a user reports suspected fraud communications received by call, SMS or WhatsApp. Users can also block a lost or stolen phone and check the mobile connections in their name

2.8 Named policies and programmes

Policy or programme	Whose	Point
National Cyber Security Policy, 2013	Department of Electronics and Information Technology (DeitY); unveiled on 2 July 2013 (the policy document is dated 1 July 2013)	Aim: to build a secure and resilient cyberspace for citizens, businesses and the Government. Its objectives and strategies include an original target of 500,000 skilled professionals in five years (a target, not proof of achievement), 24x7 mechanisms at the national and sectoral levels, and public-private partnerships

Policy or programme	Whose	Point
Cyber Surakshit Bharat	MeitY	A public-private partnership programme to educate and enable the Chief Information Security Officers (CISOs) and the wider information technology community of the Central and State Governments, banks and public sector undertakings (PSUs)
Cyber Crisis Management Plan	Formulated by CERT-In	For countering cyber attacks and cyber terrorism. It is meant for the Central and State Ministries and Departments and for the critical sectors

- **Policy is not a statute:** the 2013 Policy is a framework of objectives and strategies; the IT Act is legislation and CERT-In's directions have a statutory basis. MeitY's Annual Report 2024-25 says the separate National Cyber Security Strategy was formulated and was under approval. Do not treat that dated statement as proof that a new strategy has since been formally adopted.

2.9 Two international treaties

- **Budapest Convention:** the Council of Europe's Convention on Cybercrime, opened for signature on 23 November 2001 and in force since 1 July 2004. The Council reported 83 parties when Seychelles acceded on 17 September 2026; it enters into force for Seychelles on 1 January 2027. India is not listed as a party in the official list checked on 10 October 2026. This is a separate treaty from the UN Convention.
- **United Nations Convention against Cybercrime:** the United Nations General Assembly adopted it on 24 December 2024. It was opened for signature at Hanoi, Viet Nam, on 25 October 2025, and stays open for signature at the United Nations Headquarters in New York until 31 December 2026. Under Article 65, it enters into force on the 90th day after deposit of the 40th instrument of ratification, acceptance, approval or accession. A regional organisation's instrument is not counted in addition to those of its member States. It had not entered into force in the UN status record checked on 10 October 2026. It aims to strengthen international cooperation, including the sharing of electronic evidence for serious crimes, and gives the States Parties a 24x7 network for cooperation.
- **India's position:** The United Nations Treaty Collection records India's signature on **25 September 2026**. No Indian ratification is recorded in the official table checked on 10 October 2026. Signature, ratification and entry into force are different stages: signature alone does not make the Convention binding as a treaty in force for that country.

3. Extra section: which door for which problem

Situation	Where it goes	Remember
Money lost in an online fraud	Call 1930 at once, or report on cybercrime.gov.in	The complaint enters the Citizen Financial Cyber Fraud Reporting and Management System under I4C, so that the money can be stopped before it is siphoned off
Any other cyber crime	National Cyber Crime Reporting Portal	The State or Union Territory police register the FIR and investigate, because Police is a State subject
A call that threatens a ‘digital arrest’	1930 and the portal	The Government’s alert: the callers impersonate the police, NCB, CBI, RBI and other law enforcement agencies
A suspected fraud call, SMS or WhatsApp message	Chakshu on Sanchar Saathi	Run by the Department of Telecommunications
A device infected by a bot or other malware	Cyber Swachhta Kendra	Free removal tools from CERT-In
A listed cyber incident in an organisation covered by the CERT-In directions	Report it to CERT-In	The 6-hour clock starts on noticing the incident or being informed of it; report available details promptly
A threat to Critical Information Infrastructure, such as banking, telecom, power or transportation	NCIIPC	Section 70A provides for the nodal agency; section 70 covers protected systems
Coordination among the agencies at the national level	National Cyber Security Coordinator	Under the National Security Council Secretariat

- **Dates in this topic:** 23 November 2001 (Budapest Convention opened for signature); 27 October 2009 (section 70A inserted); 2 July 2013 (National Cyber Security Policy unveiled); 16 January 2014 (NCIIPC created); 2021 (Citizen Financial Cyber Fraud Reporting and Management System); 28 April 2022 (CERT-In directions); 24 December 2024 (United Nations Convention against Cybercrime adopted); 17 January 2025 (Sanchar Saathi mobile app); 25 October 2025 (the Convention opened for signature at Hanoi); 25 September 2026 (India signed the Convention, as recorded by the UN depositary).

4. Three common exam traps

1. **Cyber security bodies and cyber crime bodies are two families.** CERT-In and NCIIPC look after the security of systems, and they take their powers from two neighbouring sections: 70B for incident response and 70A for Critical Information Infrastructure. I4C, the portal cybercrime.gov.in and the number 1930 belong to the Ministry of Home Affairs and deal with crime. Even there, the FIR and the investigation stay with the State or Union Territory police.
2. **Look-alike threats.** DoS disrupts availability; DDoS does so through numerous hosts. A botnet flood is one common example, not the only possible method. Snooping can store traffic for later analysis, while eavesdropping is interception in real time. Spyware gathers

information, adware earns revenue for its developer, and ransomware locks the data and asks for money. A black hat hacker is a cracker; a white hat hacker is an ethical hacker.

3. **Compensation is not punishment, and one defence does not do another's work.** Section 43 makes a person pay compensation; the same acts attract imprisonment under section 66 only when they are done dishonestly or fraudulently. Life imprisonment is in section 66F, for cyber terrorism. A firewall guards a network against unauthorised access; an antivirus detects malware; HTTPS encrypts data on its way; a backup helps recovery after the damage is done.

7. Sources

7.1 Sources

S1 NCERT, *Computer Science*, Class XII, chapter 12 "Security Aspects" (reprint 2026-27), sections 12.2 to 12.9. https://ncert.nic.in/textbook/pdf/lecs112.pdf

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S2 NCERT, *Computer Science*, Class XI, chapter 11 "Societal Impact" (reprint 2026-27), sections 11.3 to 11.6. https://ncert.nic.in/textbook/pdf/kecs111.pdf

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S3 The Information Technology Act, 2000 (Act No. 21 of 2000), text on India Code. https://www.indiacode.nic.in/bitstream/123456789/13116/1/it_act_2000_updated.pdf

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S4 National Institute of Standards and Technology, NISTIR 7298 Revision 2, "Glossary of Key Information Security Terms" (May 2013). https://nvlpubs.nist.gov/nistpubs/ir/2013/NIST.IR.7298r2.pdf

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S6 Press Information Bureau (Ministry of Electronics and IT), "Government Taking Measures to Strengthen National Preparedness Against Cybersecurity Threats", 26 March 2025, Release ID 2115416 (reply in the Lok Sabha). https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115416

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S7 Press Information Bureau (Ministry of Home Affairs), “Incidents of Digital Arrest”, 25 March 2025, Release ID 2114750 (reply in the Lok Sabha). https://www.pib.gov.in/PressReleasePage.aspx?PRID=2114750

Police and Public Order as State subjects; I4C as an attached office of the Ministry of Home Affairs; the Government’s alert on ‘Blackmail’ and ‘Digital Arrest’; “Mann Ki Baat” of 27 October 2024; National Cyber Crime Reporting Portal as a part of I4C; Citizen Financial Cyber Fraud Reporting and Management System launched in 2021 under I4C; toll-free helpline 1930

S8 Press Information Bureau, backgrounder “Curbing Cyber Frauds in Digital India”, 8 October 2025, Release ID 2176146. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2176146

Spoofing, deepfakes, phishing and UPI fraud; helpline 1930; amount saved and number of complaints in the Citizen Financial Cyber Fraud Reporting and Management System; NCIIPC and its sectors

S9 Press Information Bureau, backgrounder “CERT-In: India’s Frontline Defender against Cyber Threats”, 23 January 2026. https://static.pib.gov.in/WriteReadData/specificdocs/documents/2026/jan/doc2026123764501.pdf

CERT-In under the Ministry of Electronics and Information Technology; over 29.44 lakh incidents handled in 2025; Cyber Swachhta Kendra as the Botnet Cleaning and Malware Analysis Centre

S10 Press Information Bureau (Ministry of Electronics and IT), “Government Highlights Digital India Initiatives for Strengthening Digital Infrastructure, Cyber Security and Data Protection”, 5 August 2026, Release ID 2294910 (reply in the Lok Sabha). https://www.pib.gov.in/PressReleasePage.aspx?PRID=2294910

Position in August 2026: National Cyber Security Coordinator under the National Security Council Secretariat; CERT-In under section 70B; National Cyber Coordination Centre implemented by CERT-In; Cyber Swachhta Kendra as a citizen-centric service of CERT-In; I4C; NCIIPC under section 70A

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NCIIPC created under section 70A through a gazette notification of 16 January 2014; a unit of the National Technical Research Organisation

S14 Press Information Bureau (Ministry of Communications), “Sanchar Saathi App: Telecom Empowerment at Citizens’ Fingertips”, 2 December 2025, Release ID 2197871. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2197871

Sanchar Saathi as an initiative of the Department of Telecommunications, with a portal and a mobile app; the app launched on 17 January 2025; Chakshu for reporting suspected fraud communications by call, SMS or WhatsApp; blocking of lost or stolen phones; checking the mobile connections in one’s name

S15 Council of Europe, list of the Parties and Observers to the Convention on Cybercrime (Budapest Convention), as on 9 October 2026. https://www.coe.int/en/web/cybercrime/parties-observers

The Budapest Convention as the Council of Europe’s Convention on Cybercrime; India not in the list of parties

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S17 United Nations Treaty Collection, official action/status table for the Convention. https://treaties-prod.un.org/Pages/showDetails.aspx?clang=_en&objid=0800000280670c50 ; certified treaty text, Articles 64–65. https://treaties.un.org/doc/Publication/CTC/Ch_XVIII_16.pdf

India signed on 25 September 2026, not 26 September; no Indian ratification recorded at the check; precise entry-into-force rule and separation of signature/ratification/entry into force

S18 National Institute of Standards and Technology, Computer Security Resource Center, Glossary, term pages "social engineering", "man-in-the-middle attack", "zero day attack" and "multi-factor authentication". https://csrc.nist.gov/glossary/term/social_engineering ; https://csrc.nist.gov/glossary/term/man_in_the_middle_attack ; https://csrc.nist.gov/glossary/term/zero_day_attack ; https://csrc.nist.gov/glossary/term/multi_factor_authentication

Meanings of social engineering (as in NIST SP 800-63-4; the password example as in NIST SP 800-82r3), the man-in-the-middle attack (as in NIST SP 1800-21B), the zero-day attack (as in CNSSI 4009-2022) and multi-factor authentication (as in CNSSI 4009-2022 and NIST SP 800-53 Rev. 5); the three kinds of authentication factor; the short forms MitM, MFA and 2FA

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S25 Council of Europe, "Seychelles becomes the 83rd Party", 17 September 2026. https://www.coe.int/en/web/cybercrime/-/seychelles-becomes-the-83rd-party-to-the-convention-on-cybercrime

Dated Budapest membership count and Seychelles' 1 January 2027 entry into force

S26 MeitY, *Annual Report 2024-25*, section 6.3.2. https://www.meity.gov.in/static/uploads/2024/12/10fcadec462c330211502fed3d24ea83.pdf

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S27 Fred Cohen, "Computer Viruses—Theory and Experiments", author's original account, "Experiments with Computer Viruses". https://www.all.net/books/virus/part5.html

November 1983 experiment and Leonard Adleman's naming contribution, correcting NCERT's historical date

S28 NIST CSRC glossary: virus; denial of service; distributed denial of service. https://csrc.nist.gov/glossary/term/virus ; https://csrc.nist.gov/glossary/term/denial_of_service ; https://csrc.nist.gov/glossary/term/distributed_denial_of_service

Host execution rather than mandatory new human click; DoS is broader than flooding; DDoS requires multiple hosts, not global spread

Topic 68 Emotional intelligence: meaning, dimensions and distinction from IQ

English

1. Concept in one line

Emotional intelligence is the ability to notice emotions in oneself and in others, to tell them apart and to use that information to guide thinking and action. The examination asks who defined it, what its dimensions are in the two best-known models, and how it differs from the intelligence that IQ expresses.

2. Revision notes

2.1 Intelligence and IQ in brief (NCERT)

- **Intelligence:** Alfred Binet defined it as the ability to judge well, understand well and reason well.
- **1905:** Alfred Binet and Theodore Simon made the first successful attempt to formally measure intelligence.
- **1908:** when they revised their scale, they gave the concept of **Mental Age (MA)**: a measure of a person's intellectual development relative to people of the same age group. **Chronological Age (CA)** is the biological age from birth. A bright child's MA is more than the CA.
- **1912:** William Stern, a German psychologist, devised the concept of **Intelligence Quotient (IQ)**: mental age divided by chronological age, and multiplied by 100.
- **Historical ratio-IQ formula used in NCERT:** IQ = (MA ÷ CA) × 100.
- **Modern scoring:** this age-ratio formula is not how all modern IQ tests are scored. Tests such as WISC-V compare performance with age-based norms and report a standard score with mean 100 and standard deviation 15. Use the ratio formula when a question supplies MA and CA.
- **NCERT's examples:** a 10-year-old child with a mental age of 12 has an IQ of 120 (12 ÷ 10 × 100). The same child with a mental age of 7 has an IQ of 70. When MA equals CA, the IQ is 100.
- The average IQ in the population is 100, irrespective of age. NCERT's text gives 90 to 110 as the range of normal intelligence.
- Keep the two apart: mental age is the idea of Binet and Simon; the quotient is Stern's.

2.2 Emotional intelligence: meaning and definitions

- **NCERT's description:** emotional intelligence is a set of skills that underlie accurate appraisal, expression and regulation of emotions. It is "the feeling side of intelligence". The notion broadens the concept of intelligence beyond the intellectual sphere.
- **Salovey and Mayer (1990):** Peter Salovey and John D. Mayer published the article "Emotional intelligence" in the journal *Imagination, Cognition and Personality* (volume 9,

pages 185 to 211). Their definition: “the subset of social intelligence that involves the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them, and to use this information to guide one’s thinking and actions.”

- **NCERT’s wording:** the concept was first introduced by Salovey and Mayer, who considered emotional intelligence as “the ability to monitor one’s own and other’s emotions, to discriminate among them, and to use the information to guide one’s thinking and actions”. NCERT gives no year and leaves out the opening words on social intelligence. In simple terms, NCERT adds, it is the ability to process emotional information accurately and efficiently.
- **Three verbs to remember:** monitor emotions, discriminate among them, use the information.
- **Goleman (1995):** Daniel Goleman’s book *Emotional Intelligence*, subtitled “Why It Can Matter More Than IQ”, made the term widely known. He popularised the term; he did not introduce the concept.
- **Earlier uses of the words:** the phrase “emotional intelligence” appears in print before 1990 (Wikipedia cites writings by Beldoch in 1964 and Leuner in 1966). In an examination that follows NCERT, the concept is credited to Salovey and Mayer.

2.3 Forerunners of the idea

- **Edward Thorndike (1920):** wrote on **social intelligence**. The 1990 definition places emotional intelligence inside this older idea.
- **Wechsler (1940):** described “non-intellective factors” in intelligent behaviour.
- **Howard Gardner (1983):** in the book *Frames of Mind* he set out the theory of multiple intelligences. NCERT lists eight intelligences in his theory. Two are forerunners of emotional intelligence: **interpersonal** intelligence (understanding the motives, feelings and behaviours of other people) and **intrapersonal** intelligence (understanding one’s own feelings, motives and desires).
- Do not mix them up: “social intelligence” is Thorndike’s term; “interpersonal” and “intrapersonal” are Gardner’s.

2.4 The dimensions: two lists side by side

Mayer and Salovey’s four-branch ability model was set out in 1997 and later refined, including by Mayer, Caruso and Salovey in their peer-reviewed 2016 article. Goleman’s article “What Makes a Leader?” (*Harvard Business Review*, 1998) gives five components of emotional intelligence at work. The examples are illustrations.

Model	Dimension	Meaning in one line	Example from public service
Mayer and Salovey (branch)	1. Perceiving emotions	Detecting emotions in faces, voices and pictures	At a grievance hearing, an officer notices from a petitioner’s shaking voice that he is afraid, not angry
Mayer and Salovey (branch)	2. Using emotions to facilitate thought	Using emotional information to support attention, judgment and problem-solving	After visiting a flooded village, an officer lets her concern sharpen her planning of relief

Model	Dimension	Meaning in one line	Example from public service
Mayer and Salovey (branch)	3. Understanding emotions	Knowing the language of emotions and how one emotion leads to another	A police officer knows that a crowd's grief can turn into anger if nobody gives it information
Mayer and Salovey (branch)	4. Managing emotions	Regulating emotions in oneself and in others	An officer stays calm before an agitated delegation and calms the group so that talks can begin
Goleman (component)	1. Self-awareness	Recognising and understanding one's own moods, emotions and drives, and their effect on others	An officer knows that interruptions irritate him, and watches for this in public hearings
Goleman (component)	2. Self-regulation	Controlling or redirecting disruptive impulses and moods	An officer who is insulted in a meeting does not hit back; she replies after checking the file
Goleman (component)	3. Motivation	A passion to work for reasons beyond money or status; pursuing goals with energy and persistence	A health worker keeps visiting a remote hamlet though no reward is offered for it
Goleman (component)	4. Empathy	Understanding the emotional make-up of other people	A hospital superintendent looks at a delay as the patient's waiting family sees it
Goleman (component)	5. Social skill	Managing relationships and building networks	A project officer brings engineers, the panchayat and villagers to one table and gets an agreement

- The four branches cover emotion-related problem-solving. Perceiving includes recognising one's own emotions as well as reading others. Managing emotions means thoughtful regulation, not suppressing every feeling or staying cheerful all the time.
- The four branches are all abilities that deal with emotions. Motivation, empathy and social skill are names from Goleman's list, not from the four branches.
- Mayer himself writes that emotional intelligence is not agreeableness, optimism, happiness, calmness or motivation.

2.5 Three kinds of models

Kind of model	Linked with	What it treats emotional intelligence as	How it is measured
Ability model	Mayer and Salovey	A mental ability: reasoning about emotions	An ability test with emotion-based problems to solve, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)
Mixed model	Goleman	A wide array of competencies and skills	Ratings by several people who know the person (multi-rater assessment)
Mixed model	Reuven Bar-On	Interrelated emotional and social competencies, skills and facilitators ("emotional-social intelligence")	The Emotional Quotient Inventory (EQ-i), a self-report measure of 133 items, published in 1997
Trait model	K. V. Petrides	A person's own perceptions of his or her emotions (self-perceptions), which form part of personality	Self-report questionnaires, notably the Trait Emotional Intelligence Questionnaire (TEIQue)

- A self-report measure is one in which the person answers questions about himself or herself.
- Bar-On's EQ-i is usually listed with the measures of the mixed models. Because it is a self-report measure, it also appears in lists of the measures of trait emotional intelligence. Bar-On's own name for his model is the model of "emotional-social intelligence".

2.6 EQ as a term

- NCERT: Emotional Quotient (EQ) is used to express emotional intelligence in the same way as IQ is used to express intelligence.
- Bar-On associates the term "EQ" with his doctoral work, cited as 1988 in his 2006 paper. An earlier printed use is Keith Beasley's "The Emotional Quotient" in *Mensa*, May 1987, p. 25, reproduced on Beasley's own site. This establishes an early use, not a settled claim that he invented the term. Scores on Bar-On's original inventory have a mean of 100.
- The established EI models here do not calculate EQ by dividing an "emotional age" by chronological age. Different EI instruments measure different constructs; their scores are not automatically interchangeable.

2.7 Characteristics of an emotionally intelligent person (NCERT)

NCERT lists five. Emotionally intelligent persons:

1. perceive and are sensitive to their own feelings and emotions;
2. perceive and are sensitive to emotions in others, by noting body language, voice and tone, and facial expressions;

3. relate their emotions to their thoughts, and so take them into account while solving problems and taking decisions;
4. understand the powerful influence of the nature and intensity of their emotions;
5. control and regulate their emotions and the expression of emotions, in dealing with themselves and with others, to achieve harmony and peace.

2.8 Emotional intelligence against IQ

Point	IQ (intelligence)	Emotional intelligence (EQ)
What it covers	General mental ability: judging, understanding and reasoning	Perceiving, using, understanding and managing emotions, one's own and other people's
Who gave the idea	Binet and Simon (test, mental age); Stern (IQ, 1912)	Salovey and Mayer (1990); made widely known by Goleman (1995)
How it is measured	Intelligence tests: individual or group; verbal, non-verbal or performance (NCERT)	Ability tests (MSCEIT), self-report inventories (EQ-i) and ratings by others. No one test is the standard
The score	Historical ratio IQ = (MA ÷ CA) × 100; modern tests generally use age-normed standard scores, commonly centred on 100	EQ is only a way of expressing it; there is no age formula
How far it can be developed	NCERT: a product of the complex interaction of heredity and environment; heredity sets a range and the environment works within it	Goleman: it has a genetic component, increases with age and can be learned. Bar-On: scores rise with age and after training. Evidence depends on the EI model and the training being tested
What it is said to predict	Goleman: most researchers conclude that IQ accounts for 10 to 20 per cent of career success; IQ is the better guide to what kind of job a person can hold	Goleman: among people already in such jobs, it marks out the effective employee and leader. Reviews of many studies find a modest link with job performance

2.9 Popular claims and what researchers say

- **The claim:** "EQ accounts for 80 per cent of success." This is a popular claim.
- **Goleman's own answer** (in *TIME*): those who say this "are dead wrong". Most researchers conclude that IQ accounts for 10 to 20 per cent of career success. People then jump to the conclusion that EQ alone fills the remaining gap. That gap holds many things: family and social background, luck, and emotional intelligence among them.
- **Goleman's own claim (1998):** in his analysis, emotional intelligence proved "twice as important" as technical skills and IQ for jobs at all levels. He calls IQ and technical skills "threshold capabilities", the entry-level requirements for executive positions.
- **Researchers dispute such claims.** Mayer writes that emotional intelligence "is certainly not the best predictor of success in life", and that such claims came from

journalistic accounts of 1995 to 1998. Antonakis (2009) writes that there is no strong evidence that it predicts leadership outcomes once personality and IQ are accounted for.

- **NCERT's balanced line:** a good IQ and scholastic record is not enough to be successful in life. It does not say that IQ is unimportant.

2.10 Why it matters in administration

- An administrator meets people under strain: petitioners, victims, protesters and tired staff. Reading their emotions correctly leads to better decisions.
- An officer who manages his or her own anger and fear stays fair under pressure.
- Work with teams, elected representatives and the public depends on empathy and social skill.
- Later topics take up each part in detail: recognising emotions in situations (Topic 128), Goleman's model (Topic 258) and the Mayer and Salovey model (Topic 778).

3. Extra section: a timeline of the idea, from IQ to EQ

Year	Who	What
1905	Alfred Binet and Theodore Simon	First successful attempt to formally measure intelligence
1908	Binet and Simon	Scale revised; concept of Mental Age
1912	William Stern	Concept of Intelligence Quotient
1920	Edward Thorndike	Work on social intelligence
1940	Wechsler	"Non-intellective factors" in intelligent behaviour
1983	Howard Gardner	*Frames of Mind*: multiple intelligences, among them interpersonal and intrapersonal
1990	Peter Salovey and John D. Mayer	Article "Emotional intelligence": the concept defined
1995	Daniel Goleman	Book *Emotional Intelligence*: the term becomes widely known
1997	Mayer and Salovey; Reuven Bar-On	Four-branch ability model set out; Bar-On's Emotional Quotient Inventory (EQ-i) published
1998	Daniel Goleman	Article "What Makes a Leader?": five components at work

How to read the timeline:

- The measuring of intelligence came first (1905 to 1912). Salovey and Mayer's formal 1990 paper came 78 years after Stern's IQ concept.
- The order inside emotional intelligence is: concept (1990), popular book (1995), four-branch model and inventory (1997), five components at work (1998).
- Thorndike and Gardner come before 1990. They are forerunners, not authors of the concept.

4. Three common exam traps

1. **“Goleman gave the concept of emotional intelligence.”** NCERT says the concept was first introduced by Salovey and Mayer. Goleman’s book came five years after their article and made the term widely known. A question may also ask which came first, the article or the book.
2. **“EQ is calculated like IQ.”** The historical ratio-IQ formula uses two ages; modern IQ tests often use age-normed scores. The EI measures discussed here have no corresponding age formula: NCERT says only that EQ is used to express emotional intelligence in the same way as IQ is used to express intelligence. Emotional intelligence is assessed with the kinds of measures in 2.5, and no single measure is the standard.
3. **“EQ decides 80 per cent of success, so IQ does not matter.”** This is a popular claim, not a finding. Goleman himself calls it wrong, and Mayer says emotional intelligence is certainly not the best predictor of success in life. NCERT’s line is only that a good IQ is “not enough”.

7. Sources

7.1 Sources

S1 NCERT, *Psychology* (Class XII), Chapter 1, “Variations in Psychological Attributes”, reprint 2026-27. https://ncert.nic.in/textbook/pdf/lepy101.pdf

Binet’s definition of intelligence; Binet and Simon, 1905, “first successful attempt to formally measure intelligence”; Mental Age (1908) and Chronological Age; bright child’s MA more than CA; William Stern, 1912, a German psychologist, and IQ as MA divided by CA multiplied by 100; the examples of IQ 120 and IQ 70; average IQ 100; 90 to 110 as normal intelligence; Gardner’s eight intelligences, interpersonal and intrapersonal; types of intelligence tests; heredity and environment; the whole NCERT account of emotional intelligence: “set of skills”, “feeling side of intelligence”, “first introduced by Salovey and Mayer”, NCERT’s wording of the definition, “process emotional information accurately and efficiently”, Emotional Quotient, “a good IQ and scholastic record is not enough”, and Box 1.2, the five characteristics of emotionally intelligent persons

S2 University of New Hampshire Scholars Repository, record of Peter Salovey and John D. Mayer, “Emotional intelligence”, *Imagination, Cognition and Personality*, volume 9, pages 185-211, dated 1 March 1990. https://scholars.unh.edu/psych_facpub/450

Authors, title, journal, volume, pages and year of the 1990 article; its abstract (“a set of skills”)

S3 The Pennsylvania State University, World Campus, course WFED 410, Lesson 3, “Emotional Intelligence and Leadership”. https://courses.worldcampus.psu.edu/welcome/wfed410/001/content/03_lesson/02_page.html

The 1990 definition of Salovey and Mayer quoted with its page (p. 189); Goleman’s 1995 book *Emotional Intelligence* popularised the term

S4 Wikipedia, “Emotional intelligence” (citing Mayer, Salovey and Caruso; Goleman, *Emotional Intelligence*, Bantam Books; Gardner, *Frames of Mind*, Basic Books, 1983; Beldoch, 1964; Leuner, 1966; Petrides; Antonakis, 2009; O’Boyle and others, 2011). https://en.wikipedia.org/wiki/Emotional_intelligence

Ability, mixed and trait models; the four branches and their meanings; the MSCEIT as an ability test of emotion-based problem-solving items; trait model of Petrides measured by self-report; subtitle of Goleman’s book; Gardner, 1983; earlier uses of the phrase in 1964 and 1966; the first published use of “EQ” in an article by Keith Beasley, 1987; “Tests measuring EI have not replaced IQ tests as a standard metric of intelligence”; some researchers hold that it can be learned and others that it is innate; modest correlations with job performance in meta-analyses; Antonakis on leadership outcomes

S5 John D. Mayer, “What Emotional Intelligence Is and Is Not”, *Psychology Today*, 21 September 2009. https://www.psychologytoday.com/us/blog/the-personality-analyst/200909/what-emotional-intelligence-is-and-is-not

Emotional intelligence as reasoning about emotions; it is not agreeableness, optimism, happiness, calmness or motivation; “certainly not the best predictor of success in life”; journalistic accounts of 1995 to 1998; the example of how one emotion follows another

S6 Reuven Bar-On, “The Bar-On model of emotional-social intelligence (ESI)”, *Psicothema*, volume 18, supplement, 2006, pages 13-25. https://www.psicothema.com/pdf/3271.pdf

Thorndike on social intelligence in 1920; Wechsler’s non-intellective factors, 1940; Gardner, 1983; the three major models and how each is measured (ability test, multi-rater assessment, self-report); the EQ-i as a self-report measure of 133 items, published in 1997; Bar-On’s statement that he coined “EQ” in 1988; scores with a mean of 100; scores rising with age and after training

S7 Daniel Goleman, “What Makes a Leader?”, *Harvard Business Review*, November-December 1998 (copy hosted by Wake Forest University); the publisher’s page for the January 2004 reprint. https://clc.business.wfu.edu/wp-content/uploads/2017/06/Goleman-1998-What-Makes-a-Leader.pdf ; https://hbr.org/2004/01/what-makes-a-leader

The five components of emotional intelligence at work and the meaning of each; “threshold capabilities” and “entry-level requirements”; “twice as important”; genetic component, increase with age, and that it can be learned

S8 *TIME* (Ideas), “They’ve Taken Emotional Intelligence Too Far”, by the author of *Emotional Intelligence* (Daniel Goleman). https://ideas.time.com/2011/11/01/theyve-taken-emotional-intelligence-too-far/ ; https://ideas.time.com/?p=987

The claim that EQ accounts for 80 per cent of success and the answer that this is “dead wrong”; IQ accounting for 10 to 20 per cent of career success; the remaining gap filled by many factors; IQ deciding the kind of job a person can hold; emotional intelligence marking out the effective employee and leader

S9 Encyclopaedia Britannica, “emotional intelligence” (updated 7 September 2026). https://www.britannica.com/science/emotional-intelligence

Emotional intelligence as a set of faculties for perceiving, understanding, expressing and controlling emotions; “EI” and “EQ” as its other names

S10 Encyclopaedia Britannica, “IQ” (updated 23 July 2026). https://www.britannica.com/science/IQ

IQ originally computed as the ratio of mental age to chronological age, multiplied by 100; a score of 100, where mental age equals chronological age, as the average

S11 Mayer, J. D., Caruso, D. R., and Salovey, P. (2016), “The Ability Model of Emotional Intelligence: Principles and Updates”, *Emotion Review* 8(4), 290–300, DOI 10.1177/1754073916639667. Author-deposited record: https://scholars.unh.edu/psych_facpub/320/ ; author-uploaded full text: https://www.researchgate.net/publication/306297587_The_Ability_Model_of_Emotional_Intelligence_Principles_and_Updates

Primary peer-reviewed source for the four branches, the 1997 model, ability-based assessment and the distinction between ability and behaviour; supersedes S4 for these claims

S12 Keith Beasley, “The Emotional Quotient”, *Mensa*, May 1987, p. 25; author’s reproduction: https://www.keithbeasley.co.uk/EQ/Original%20EQ%20article.pdf

An early printed use of EQ, without asserting absolute priority

S13 Pearson, *WISC-V Interpretive Report*, explanation of scores, p. 2. https://www.pearsonassessments.com/content/dam/school/global/clinical/us/assets/wisc-v/wisc-v-interpretive-report.pdf

Modern age-normed IQ scores, mean 100 and SD 15; distinction from historical ratio IQ

S14 Petrides and colleagues (2016), “Developments in Trait Emotional Intelligence Research”, *Emotion Review* 8(4), 335–341, DOI 10.1177/1754073916650493. https://discovery.ucl.ac.uk/id/eprint/1523261/

Author-deposited peer-reviewed source for trait EI as emotion-related self-perceptions and its measurement

S15 Salovey and Mayer (1990), original article, author-uploaded full text: https://www.researchgate.net/publication/267777418_Emotional_Intelligence

Original definition on printed p. 189; read alongside S2

Topic 69 Mean, median and mode

English

1. Concept in one line

The mean, the median and the mode are three ways of giving one value that stands for a whole set of data: the mean shares the total equally, the median marks the middle of the ordered data, and the mode is the value that occurs most often. The exam asks you to find them from a list or a simple frequency table, to find a missing value or correct a misread value when the mean is given, and to say how each measure changes when the data change.

2. Revision notes

2.1 The three measures at a glance

- Data are collected facts, most often numbers such as marks, runs, ages or wages. Each number in the data is a value; textbooks also call it an observation.
- A measure of central tendency is a single value that represents the whole data. The mean, the median and the mode are the three in common use.
- In everyday speech and in exam questions, “average” means the arithmetic mean. Topic 19 used the word in this sense.
- The range is not a measure of central tendency. It shows how far the data are spread.

Measure	What it is	For the data 2, 3, 3, 5, 6, 8, 15
Mean	The sum of the values divided by the number of values	42 ÷ 7 = 6
Median	The middle value when the values are arranged in order (for an even number of values, see 2.3)	The 4th of the 7 values: 5
Mode	The value that occurs most often	3 (it occurs twice)
Range	The highest value minus the lowest value	15 - 2 = 13

2.2 Arithmetic mean

- **Mean = sum of all the values ÷ number of values.** Its full name is the arithmetic mean; it is also called the average.
- Example: the marks 42, 35, 58, 61 and 54 add up to 250. Mean = 250 ÷ 5 = 50.
- Turn the formula round: **sum = mean × number of values**, and, when the mean is not zero, number of values = sum ÷ mean. If the mean of 12 values is 15, their sum is 12 × 15 = 180. Most exam problems on the mean start with this step.
- The mean is the equal share: if the sum were shared out equally, every value would be equal to the mean.
- The mean is never less than the smallest value and never more than the greatest value.

- The mean need not be one of the values of the data, and it need not be a whole number: the mean of 4 and 7 is 5.5.
- The order in which the values are written makes no difference to the mean.

2.3 Median

- First arrange the values in ascending order; descending order gives the same answer. Let n be the number of values.
- **If n is odd:** the median is the value in position (n + 1)/2.
- **If n is even:** there are two middle values, in positions n/2 and n/2 + 1. The median is the mean of these two.

Data	Arranged in ascending order	n	Position	Median
31, 12, 45, 27, 19, 38, 23	12, 19, 23, 27, 31, 38, 45	7	(7 + 1)/2 = 4th position	27
14, 9, 21, 17, 30, 12	9, 12, 14, 17, 21, 30	6	3rd and 4th positions	(14 + 17) ÷ 2 = 15.5

- (n + 1)/2 is a position, not the median itself. For 7 values it gives 4; the median is the 4th value, which is 27.
- A value that occurs more than once is written as many times as it occurs: 5, 3, 5, 8, 5 is arranged as 3, 5, 5, 5, 8, and the median is 5.
- The median is the centre by position. For odd n, the middle observation has equally many positions on either side; for even n, use the two middle observations. With repeated values, it is not necessary for exactly half the values to be strictly smaller and half strictly larger.
- When the number of values is even, the median need not be one of the values of the data (15.5 in the table above).

2.4 Mode and range

- The frequency of a value is the number of times it occurs. **The mode is the value that occurs most often**, that is, the value with the highest frequency.
- Data may have one mode, more than one mode, or no mode:

Data	Which value occurs most often	Mode
4, 6, 6, 7, 9, 6, 4	6 occurs three times	6 (one mode)
1, 4, 4, 6, 9, 9, 10	4 and 9 occur twice each	4 and 9 are both modes (bimodal data)
3, 8, 11, 15, 20	Every value occurs only once	There is no mode

- Data with more than one mode are called multimodal; data with exactly two modes are called bimodal.
- When the data have two or more different values and all of them occur equally often, no value stands out, and the data are said to have no mode.
- The mode is a value of the data, not its frequency: in the first row of the table the mode is 6, not 3. It is not the greatest value either: in 4, 7, 7, 12, 7, 20 the mode is 7, not 20.

- A mode can be found even for data that are not numbers, for example the colour that most people choose.
- **Range = highest value - lowest value.** For 4, 6, 6, 7, 9, 6, 4 the range is 9 - 4 = 5. It tells how far the data are spread, not where their middle is.

2.5 The three measures from a simple frequency table

A frequency table lists each value (x) once and writes its frequency (f) beside it. The marks of 25 students in a test of 10 marks are as follows:

Marks (x)	Number of students (f)	f × x	Cumulative frequency
5	2	10	2
6	5	30	7
7	8	56	15
8	6	48	21
9	4	36	25

- **Mean = (the sum of the f × x values) ÷ (the sum of the f values)** = 180 ÷ 25 = 7.2. Books write this as Σfx ÷ Σf, where Σ (the Greek letter sigma) means “the sum of”. Divide by the total frequency (25), not by the number of rows (5).
- **Mode:** the value with the highest frequency. Here the highest frequency is 8, so the mode is 7 marks.
- **Median:** the rows must stand in ascending order of x; if they do not, arrange them first. Then use the cumulative frequency, which is the running total of the frequencies from the top. It tells how many values there are up to the end of that row: here the values in positions 8 to 15 are all 7.
  - Take the total frequency N in place of n. N = 25 is odd, so the median is in position (25 + 1)/2 = 13.
  - Go down the cumulative frequency column and stop at the first row in which it is 13 or more. In that row the cumulative frequency is 15, so the median is 7 marks.
- If N is even, find the two middle values, that is, the values in positions N/2 and N/2 + 1, in the same way and take their mean. The two may lie in two different rows; Example 3 in Section 3 is such a case.

2.6 When every value is changed by the same number

Here k is positive when we say “rises” or “falls”. The mode rules apply to each existing mode; a one-to-one change does not create a unique mode when none exists.

Change made to every value	Mean	Median	Mode	Range
k is added	Rises by k	Rises by k	Rises by k	Does not change
k is subtracted	Falls by k	Falls by k	Falls by k	Does not change
Multiplied by k (k is positive)	Becomes k times	Becomes k times	Becomes k times	Becomes k times
Divided by k (k is positive)	Becomes 1/k of itself	Becomes 1/k of itself	Becomes 1/k of itself	Becomes 1/k of itself

- Check with 2, 3, 3, 5, 6, 8, 15 (mean 6, median 5, mode 3, range 13). If 10 is added to every value, the mean, the median and the mode become 16, 15 and 13; the range stays 13. If every value is multiplied by 3, the mean, the median and the mode become 18, 15 and 9; the range becomes 39.
- Reason: when a number is added, every value moves by the same distance, so the order of the values and the gaps between them stay as they were. When the values are multiplied by a positive number, every value and every gap between values changes in the same ratio.
- Two changes together: if every value is doubled and then 5 is added, each of the three measures is doubled and then rises by 5; the range is only doubled.
- For positive data, raising every value by 10% means multiplying it by 1.1 (Topic 29). The mean, median and any modes are multiplied by 1.1; the range is also multiplied by 1.1. A zero range remains zero.

2.7 An extreme value, and which measure suits which data

- An extreme value is a value that is much greater or much smaller than the other values.
- The monthly incomes of five families, in thousands of rupees, are 18, 20, 22, 25 and 30. The mean is 115 ÷ 5 = 23 and the median is 22. If the last income is 300 and not 30, the mean jumps to 385 ÷ 5 = 77, but the median is still 22.
- Every value enters the working of the mean, so a single extreme value pulls the mean towards itself. The median depends only on the values in the middle of the order, so it moves a little or not at all. The mode too usually does not change.

Measure	Effect of an extreme value	What it suits
Mean	It moves a long way towards the extreme value	It suits data that have no extreme values, and cases where the total matters: average marks, average runs
Median	The effect is small, or there is none	It suits data that have a few very high or very low values, where a “typical” value is wanted: incomes, wages
Mode	Usually there is none	It suits finding what is most common or most popular: the television programme that most people watch, the vehicle colour that most people choose. It also works for data that are not numbers

2.8 Deviations, a missing value and a misread value

- The deviation of a value from the mean is “value - mean”. **The sum of the deviations of all the values from their mean is zero.** For 42, 35, 58, 61 and 54 (mean 50) the deviations are -8, -15, 8, 11 and 4; their sum is 0. The values above the mean exactly balance the values below it.
- **A missing value.** Missing value = (mean × number of values) - (sum of the known values). The mean of 6 values is 23, and five of them are 18, 27, 21, 30 and 16. Sum = 6

× 23 = 138; the sum of the five known values is 112; the missing value is 138 - 112 = 26.

  - The same working with deviations: the deviations of the five known values from 23 are -5, 4, -2, 7 and -7; their sum is -3. So the last deviation must be +3, and that value is 23 + 3 = 26.

- **A misread value.** First correct the sum; then divide by the same number of values: correct sum = wrong sum - wrong value + right value. The mean of 20 values was worked out as 35, but one of them, 46, had been misread as 64. Wrong sum = 20 × 35 = 700. Correct sum = 700 - 64 + 46 = 682. Correct mean = 682 ÷ 20 = 34.1.
  - In one line: correct mean = wrong mean + (right value - wrong value) ÷ number of values = 35 + (-18) ÷ 20 = 35 - 0.9 = 34.1.

Other days cover these: shortcuts and the deviation method for the mean (Topic 229); the weighted mean (Topic 349); adding, removing and replacing values (Topic 519); the median for grouped data (Topic 679); the mode for grouped data and the empirical relation among the three measures (Topic 819); consecutive numbers and combined groups (Topic 939).

3. Extra section: worked examples

Example 1. All four from one list. The runs scored by a batter in 8 innings are 18, 30, 12, 24, 18, 42, 36 and 20. Sum = 200, so the mean is 200 ÷ 8 = 25. In ascending order: 12, 18, 18, 20, 24, 30, 36, 42. The 4th and 5th values are 20 and 24, so the median is (20 + 24) ÷ 2 = 22. The mode is 18 (it occurs twice). The range is 42 - 12 = 30.

Example 2. A missing value. The mean of 8, 11, x, 14, 17 and 22 is 15. What is x? Sum = 6 × 15 = 90. The sum of the five known values is 72. So x = 90 - 72 = 18.

Example 3. A table whose total frequency is even. The number of books read in a month by 50 students:

Books read (x)	Number of students (f)	f × x	Cumulative frequency
1	6	6	6
2	9	18	15
3	10	30	25
4	15	60	40
5	10	50	50

Mean = 164 ÷ 50 = 3.28 books. Mode = 4 books (the highest frequency is 15). Median: N = 50 is even, so the 25th and 26th values are needed. The cumulative frequency reaches 25 in the row for 3, so the 25th value is 3. That row ends there; the 26th value is in the next row, so it is 4. Median = (3 + 4) ÷ 2 = 3.5 books.

Example 4. When every value changes. For some values the mean is 40, the median is 38, the mode is 35 and the range is 22 (for example 30, 35, 35, 38, 41, 49, 52). Every value is doubled and then 5 is added. New mean = 2 × 40 + 5 = 85; new median = 2 × 38 + 5 = 81; new mode = 2 × 35 + 5 = 75; new range = 2 × 22 = 44. Check: the new values are 65, 75, 75, 81, 87, 103, 109; their sum is 595; 595 ÷ 7 = 85.

Example 5. An extreme value. The daily wages of 7 workers, in rupees, are 400, 420, 450, 450, 480, 500 and 2,200. Sum = 4,900, so the mean = 700. Median = the 4th value = 450.

Mode = 450. Six of the seven workers get less than the mean, so here the median (or the mode) shows the position of a typical worker better.

Example 6. Deviations. The deviations of five values from their mean are -6, -2, 0, 3 and d. As the sum of the deviations is zero, -6 - 2 + 0 + 3 + d = 0; hence d = 5. If the mean is 20, the values are 14, 18, 20, 23 and 25; their sum is 100; 100 ÷ 5 = 20.

Example 7. A misread value. The mean of 25 values was worked out as 52. One of them, 78, had been misread as 28. Wrong sum = 25 × 52 = 1,300. Correct sum = 1,300 - 28 + 78 = 1,350. Correct mean = 1,350 ÷ 25 = 54. In one line: 52 + (78 - 28) ÷ 25 = 52 + 2 = 54.

4. Three common exam traps

1. **The median of a list that is not arranged.** The middle value is the median only after the values are arranged in order. In 9, 2, 16, 4, 11 the value written in the middle is 16, but the median is 9 (2, 4, 9, 11, 16). If the number of values is even, there is no single middle value: for 2, 4, 9, 11 the median is (4 + 9) ÷ 2 = 6.5. Also, (n + 1)/2 tells where the median stands, not how much it is.
2. **The mode is a value: it is not a count and not the greatest number.** In 5, 8, 8, 8, 13, 21 the mode is 8; it is not 3 (3 is its frequency) and not 21 (21 is the greatest value). Data may have two modes, or no mode at all; do not force a single answer. In a frequency table, look for the row in which f is the highest and take the value in the x column as the mode.
3. **The mean is not “what lies in the middle”, and not every change acts alike.** The mean does not always show the typical position: if the wages are 300, 320, 340, 360 and 1,680, the mean is 600, but four of the five are less than it, and the median is 340. If the same number is added to every value, the mean, the median and the mode change by that number but the range does not change; if every value is multiplied by the same positive number, all four become that many times.

7. Sources

7.1 Sources

S1 NCERT, *Mathematics*, Class VII, Chapter 3 “Data Handling” (the textbook used before *Ganita Prakash*), read on the SATHEE portal of IIT Kanpur. Sections 3.1 “Representative Values”, 3.2 “Arithmetic Mean”, 3.2.1 “Range”, 3.3 “Mode”, 3.3.1 “Mode of Large Data”, 3.4 “Median” and “What have we discussed?”. https://sathee.iitk.ac.in/ncert-books/class-07/mathematics/chapter-3-data-handling

Average as a number that shows the central tendency of data; “average”, “arithmetic mean” and “mean” as names of one measure; mean = sum of all observations ÷ number of observations; the mean lies between the greatest and the smallest observations; range = highest observation minus lowest observation, as an idea of the spread; mode as the observation that occurs most often; data with two modes; mode read from a table of frequencies; median as the middle value of the arranged data, with half the observations above and half below; mean, median and mode each suiting different situations

S2 NCERT, *Exemplar Problems: Mathematics*, Class IX, Unit 14 “Statistics and Probability”, “Main Concepts and Results” and Exercises 14.1 to 14.4. https://ncert.nic.in/pdf/publication/exemplarproblem/classIX/mathematics/ieep214.pdf

Mean of raw data and of an ungrouped frequency distribution (the sum of f × x ÷ the sum of f); median as the (n + 1)/2 th observation for odd n and the mean of the n/2 th and (n/2 + 1)th observations for even n; mode as the observation with maximum frequency, not the observation with the highest value; the median needs the data arranged first; the mean rises by 5 when each observation is increased by 5 and doubles when each observation is multiplied by 2; the sum of the deviations from the mean is 0; a missing value found from a given mean; a mean corrected after one observation was misread; range

S3 NCERT, *Mathematics*, Class X, Chapter 13 “Statistics” (reprint 2026-27), Sections 13.2 “Mean of Grouped Data”, 13.3 “Mode of Grouped Data” and 13.4 “Median of Grouped Data”. https://ncert.nic.in/textbook/pdf/jemh113.pdf

Mean as the sum of the values of all the observations divided by the total number of observations; the form with f and x and the Greek letter sigma for summation; mode as the value with the maximum frequency; “multimodal” data; the median of ungrouped data from a frequency table by cumulative frequency, with the two middle observations in different rows; extreme values affect the mean; the median for a “typical” observation such as wages; the mode for the most frequent value or most popular item (television programme, colour of vehicle)

S4 National Institute of Open Schooling (NIOS), Secondary Course Mathematics (211), Lesson 25 “Measures of Central Tendency”, Sections 25.1 to 25.3. https://digital.nios.ac.in/content/211en/Chapter-25.pdf

An average is called a measure of central tendency; mean of raw data and of ungrouped data; median as the middlemost observation, with the rules for odd and even n; the median of ungrouped data by cumulative frequency; mode as the observation that occurs most frequently; data in which every observation has the same frequency have no mode; the deviations from the mean add up to zero; a missing value found from a given mean; the mean is affected by extreme values

S5 Wikipedia, “Arithmetic mean” (citing Jacobs 1994, *Mathematics: A Human Endeavor*, 3rd edition, p. 547; Weisstein, “Arithmetic Mean”, MathWorld). https://en.wikipedia.org/wiki/Arithmetic_mean

The arithmetic mean as the sum of a collection of numbers divided by the count of numbers; the deviations from the mean sum to zero; the mean is not a robust statistic and is greatly influenced by outliers; skewed data such as incomes

S6 Wikipedia, “Mode (statistics)” (citing Gujarati 2006, *Essentials of Econometrics*, 3rd edition, p. 110, for the definition). https://en.wikipedia.org/wiki/Mode_(statistics)

The mode as the value that appears most often; bimodal and multimodal data; when every value is replaced by a times the value plus b, the mean, the median and the mode change in the same way; the median is robust in the presence of outliers while the mean is sensitive; the mode also makes sense for data that are not numbers

Topic 70 Current affairs: G20 and the Johannesburg Summit of 2025

English

1. Concept in one line

The G20 (Group of 20) is a forum of 19 countries, the European Union and the African Union for international economic cooperation, led each year by a rotating presidency; South Africa held the presidency for 2025 and hosted the Leaders' Summit at Johannesburg on 22 and 23 November 2025, the first on African soil. The examination asks about the members, the way the G20 works, the themes and summit cities of recent presidencies, the Johannesburg Leaders' Declaration and India's proposals at the summit.

2. Revision notes

2.1 What the G20 is and how it works

- **What it is:** a forum of developed and developing countries that seeks solutions to global economic and financial issues. In 2009 it was designated the "premier forum for international economic cooperation".
- **1999:** The G20 was created in 1999, in response to the economic crises of the late 1990s. The member countries were represented by their finance ministers and central bank governors. The first meeting was held on 15 and 16 December 1999.
- **2008:** The G20 was raised to the level of Heads of State or Government in the wake of the global economic and financial crisis of 2007 (as the website of India's G20 presidency dates it). The leaders met at Washington, D.C. on 14 and 15 November 2008, at an emergency summit. It is the first in the list of Leaders' Summits on the website of India's G20 presidency.
- **Weight (figures on the G20 website):** the members represent about 85% of global GDP (gross domestic product), over 75% of international trade and about two-thirds of the world's population.
- **No permanent secretariat:** the G20 has no permanent secretariat or staff. The member holding the presidency runs the work.
- **Presidency:** it rotates every year among the members. The member holding it steers the agenda for one year and hosts the Leaders' Summit. In recent years the presidency has changed hands on 1 December: India held it from 1 December 2022 to 30 November 2023, Brazil took over on 1 December 2023 and South Africa on 1 December 2024.
- **Troika:** the troika is a group of three members: the previous presidency, the current presidency and the incoming presidency. The current presidency is thus one of the three, not a fourth. The troika supports the work of the presidency.

Year	Previous presidency	Current presidency	Incoming presidency
2023	Indonesia	India	Brazil
2024	India	Brazil	South Africa

Year	Previous presidency	Current presidency	Incoming presidency
2025	Brazil	South Africa	United States

- **Two tracks:** the Finance Track is led by the finance ministers and central bank governors. The Sherpa Track is led by the Sherpas, who are the personal emissaries of the leaders.
- **Engagement groups:** these bring together civil society, parliamentarians, think tanks, women, youth, labour, businesses and researchers of the G20 countries.

2.2 Members

- At the Johannesburg summit in November 2025, the G20 comprised 21 members: 19 countries and 2 regional organisations.
- **The 19 countries:** Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Türkiye, the United Kingdom and the United States.
- **The 2 regional organisations:** the European Union (EU) and the African Union (AU).
- **African Union:** it was accepted as a permanent member at the New Delhi summit of September 2023, during India's presidency. The Johannesburg Declaration says that the leaders "embrace the African Union as a full member of the G20" (it had joined in 2023, not at Johannesburg).
- **South Africa:** it is the one African country among the 19, and in 2025 it became the first African country to hold the G20 presidency.
- **Guests are not members:** each presidency invites some countries as guests. Spain and Singapore were among the countries invited in 2025.

2.3 Presidencies and Leaders' Summits, 2021 to 2026

Year	Presidency	Leaders' Summit: city and dates	Theme or motto, and points to remember
2021	Italy	Rome, 30 and 31 October 2021	Motto: "People, Planet, Prosperity"
2022	Indonesia	Bali, 15 and 16 November 2022	The 17th Leaders' Summit. Theme: "Recover Together, Recover Stronger". India took over the presidency from Indonesia on 1 December 2022
2023	India	New Delhi, 9 and 10 September 2023	The 18th summit, and the first held in India. Theme: "Vasudhaiva Kutumbakam", given in English as "One Earth, One Family, One Future"

Year	Presidency	Leaders' Summit: city and dates	Theme or motto, and points to remember
2024	Brazil	Rio de Janeiro, 18 and 19 November 2024	The 19th summit. Motto: "Building a Just World and a Sustainable Planet". The first full summit with the African Union as a member
2025	South Africa	Johannesburg, 22 and 23 November 2025	The 20th summit. Theme: "Solidarity, Equality, Sustainability". The first Leaders' Summit on the African continent
2026	United States	Trump National Doral, Miami, Florida, 14–15 December 2026 (scheduled; US Treasury, 19 February 2026)	Three priorities named in the same statement (see 2.9)

2.4 South Africa's presidency of 2025

- **Theme:** "Solidarity, Equality, Sustainability".
- **Four priorities:** disaster resilience; debt sustainability; finance for the energy transition; critical minerals.
- **Other work streams:** inclusive economic growth, industrialisation, employment and reduced inequality; food security; artificial intelligence (AI) and innovation for sustainable development.
- **The summit:** the 20th Leaders' Summit was held at the Johannesburg Expo Centre on 22 and 23 November 2025, with President Cyril Ramaphosa in the chair.
- **Ubuntu:** the Declaration recalls the African idea of Ubuntu, which it renders as "I am because we are".
- **Handover:** the United States did not attend the Johannesburg summit. South Africa's official statement of 27 November 2025 confirms that the presidency instruments were subsequently handed to a US Embassy official at the Department of International Relations and Cooperation headquarters. The absence of an on-stage handover did not prevent the presidency from passing to the United States.

2.5 Who stayed away from Johannesburg

Several countries sent a representative in place of the leader listed below; China was represented by its Premier, who is its head of government. Government statements confirm the delegations. The United States did not send a delegation to the summit.

Member	Leader who did not come	Representation at the summit
United States	President Donald Trump	No official delegation at the Leaders' Summit
Argentina	President Javier Milei	Foreign Minister Pablo Quirno

Member	Leader who did not come	Representation at the summit
China	President Xi Jinping	Premier Li Qiang, head of government
Russia	President Vladimir Putin	Maxim Oreshkin, Deputy Chief of Staff of the Presidential Executive Office
Mexico	President Claudia Sheinbaum	Finance Minister Édgar Amador Zamora
Saudi Arabia	Crown Prince and Prime Minister Mohammed bin Salman	Foreign Minister Prince Faisal bin Farhan
Indonesia	President Prabowo Subianto	Vice President Gibran Rakabuming Raka

A leader's absence is not the same as a country's absence. Argentina participated but did not join the final declaration; the United States did not participate in the summit.

2.6 The Johannesburg Leaders' Declaration

- **Title and size:** "G20 South Africa Summit: Leaders' Declaration", in 122 paragraphs and 30 pages.
- **When it was adopted:** South Africa placed it before the leaders at the beginning of the summit, on 22 November 2025, and it was adopted then. The usual practice is to adopt the declaration at the close.
- **Who did not join:** the United States was absent. Argentina's Foreign Ministry stated on 22 November 2025 that it did not join the declaration, citing both disagreement over the consensus procedure and substantive objections to its geopolitical wording, including the Middle East. Therefore "every G20 member endorsed the declaration" is incorrect.

Subject	What the Declaration says
Peace and security	It seeks "a just, comprehensive, and lasting peace" in Sudan, the Democratic Republic of the Congo, the Occupied Palestinian Territory and Ukraine. It condemns terrorism in all its forms and manifestations
Disaster resilience	It calls for financing arranged in advance and for action before a disaster strikes. It supports the UN Early Warnings for All Initiative, to be implemented by 2027
Debt	Interest payments on the external public debt of low-income countries have more than doubled over the past decade. The leaders endorse the G20 Ministerial Declaration on Debt Sustainability
Energy	Over 600 million Africans have no electricity. The leaders support efforts to triple renewable energy capacity globally and to double the global average annual rate of energy efficiency improvements by 2030. Mission 300, led by the World Bank Group and the African Development Bank, aims to connect 300 million Africans to electricity by 2030

Subject	What the Declaration says
Critical minerals	The G20 Critical Minerals Framework is described as a voluntary, non-binding blueprint
Climate finance	Finance is to be scaled up “from billions to trillions”. Developing countries need USD 5.8 to 5.9 trillion before 2030 for their nationally determined contributions (their climate plans)
Food security	Up to 720 million people faced hunger in 2024. The leaders welcome the Ubuntu Approaches on Food Security and Nutrition
Artificial intelligence and Africa	The AI for Africa Initiative is launched as a voluntary platform for cooperation between the G20 and the African Union. The Compact with Africa enters its second phase, 2025 to 2033
UN reform	The leaders call for an enlarged Security Council, with better representation for Africa, Asia-Pacific, and Latin America and the Caribbean
What comes next	The members commit to working together under the presidency of the United States in 2026, and to meeting again in the United Kingdom in 2027 and in the Republic of Korea in 2028

2.7 India at Johannesburg

- Prime Minister Narendra Modi addressed both sessions of the opening day, 22 November 2025. One was on inclusive and sustainable economic growth. The other was on a resilient world: disaster risk reduction, climate change, just energy transition and food systems.
- He proposed six initiatives, as listed by the Press Information Bureau (PIB).

Proposal	What it is for
G20 Global Traditional Knowledge Repository	To draw on the collective wisdom of humanity
G20 Africa Skills Multiplier	To create one million certified trainers who will skill the youth of Africa
G20 Global Healthcare Response Team	Healthcare experts of the G20 countries who can be sent wherever a global health challenge arises
G20 Open Satellite Data Partnership	To give developing countries the satellite data of the space agencies of the G20, for agriculture, fisheries and disaster management
G20 Critical Minerals Circularity Initiative	To promote recycling, urban mining and second-life batteries, and to strengthen supply chains
G20 Initiative on Countering the Drug Terror Nexus	To act against drug trafficking and the money it gives to terrorism

- **Other points he made:** disaster resilience needs an approach centred on development, not only on response. Developed countries should meet their commitments on climate finance and technology in time. He said that the Deccan Principles on Food Security, adopted during India’s presidency, should be the basis of a G20 roadmap on food security, and called the entry of the African Union at the New Delhi summit a major step.

- **IBSA Leaders' Meeting:** IBSA is the forum of India, Brazil and South Africa. Its leaders met at Johannesburg, as reported by the PIB on 23 November 2025. President Ramaphosa was the host, and President Luiz Inácio Lula da Silva of Brazil attended. The Prime Minister proposed an IBSA Digital Innovation Alliance, to share digital public infrastructure such as UPI and CoWIN, and an IBSA Fund for Climate Resilient Agriculture. He said that reform of global institutions, including the UN Security Council, is "now not an option, but an imperative". The existing IBSA Fund has supported projects in 40 countries; this is not the newly proposed fund.
- **A new three-country partnership:** in a joint statement issued at Johannesburg on 22 November 2025, Australia, Canada and India agreed to the Australia-Canada-India Technology and Innovation (ACITI) Partnership. It covers critical and emerging technologies, resilient supply chains including critical minerals, green energy innovation and artificial intelligence.

2.8 India's own presidency of 2023

- **Term:** 1 December 2022 to 30 November 2023.
- **Theme:** "Vasudhaiva Kutumbakam", given in English as "One Earth, One Family, One Future".
- **Summit:** the 18th Leaders' Summit, at Bharat Mandapam in New Delhi, on 9 and 10 September 2023.
- **New Delhi Leaders' Declaration:** adopted by consensus at the summit.
- **African Union:** accepted as a permanent member of the G20.
- **Global Biofuels Alliance:** launched at the summit, to promote the use of sustainable biofuels and to work on standards and certification.
- **India-Middle East-Europe Economic Corridor:** announced on 9 September 2023 on the sidelines of the summit: a rail and shipping corridor to link India with the Middle East and Europe.

2.9 The United States presidency of 2026: dated official announcements

- **Participation dispute:** the US State Department announced on 3 December 2025 that South Africa's government would not be invited during the US presidency. South Africa's official response of 27 November asserted that it remained a full G20 member. An invitation dispute should not be described as an agreed removal of membership.
- **Statement of 3 December 2025:** the US State Department published "America Welcomes a New G20" by Secretary of State Marco Rubio. It says the following.
  - The United States is hosting the G20 for the first time since 2009.
  - Three priorities: removing regulatory burdens; unlocking affordable and secure energy supply chains; leading in new technologies and innovation.
  - The Leaders' Summit: Miami, Florida, in December 2026.
  - Poland is invited to take part.
  - The Government of South Africa will not be invited to take part during the US presidency. The statement accuses it of tolerating racism and violence against Afrikaners and of running a divisive G20 presidency. These are the allegations of the United States.

- **Official summit schedule:** the US Treasury announcement of 19 February 2026 specifies **14–15 December 2026, Trump National Doral, Miami, Florida**. These are scheduled dates, not a completed summit or an announced outcome. Check for any later official change before the examination.
- **After 2026:** the Johannesburg Declaration names the United Kingdom for 2027 and the Republic of Korea for 2028.

3. Extra section: timeline of the G20, and the Johannesburg summit in figures

Date	Event
1999	The G20 is created; first meeting on 15 and 16 December 1999
14 and 15 November 2008	The leaders meet at Washington, D.C.
2009	The G20 is designated the “premier forum for international economic cooperation”
1 December 2022	India’s presidency begins
9 and 10 September 2023	New Delhi summit; the African Union is accepted as a permanent member
1 December 2023	Brazil’s presidency begins
18 and 19 November 2024	Rio de Janeiro summit
1 December 2024	South Africa’s presidency begins
22 November 2025	The Johannesburg summit opens and the Leaders’ Declaration is adopted. India’s Prime Minister addresses both sessions of the day and makes six proposals
23 November 2025	The summit ends. The PIB reports the IBSA Leaders’ Meeting at Johannesburg
27 November 2025	South Africa confirms the handover at DIRCO headquarters and reaffirms its G20 membership
3 December 2025	The US State Department publishes “America Welcomes a New G20”
14–15 December 2026	Scheduled Leaders’ Summit at Trump National Doral, Miami, Florida (US Treasury, 19 February 2026)
2027 and 2028	Summits in the United Kingdom and the Republic of Korea, as recorded in the Johannesburg Declaration

Figure	What it stands for
21	Members of the G20: 19 countries, the European Union and the African Union
20th	Number of the Johannesburg Leaders’ Summit
122 paragraphs, 30 pages	Size of the Johannesburg Leaders’ Declaration
4	Priorities of South Africa’s presidency

Figure	What it stands for
6	Initiatives proposed by India’s Prime Minister
One million	Certified trainers under the proposed G20 Africa Skills Multiplier
Over 600 million	Africans without electricity, as the Declaration notes
300 million	Africans to be connected to electricity by 2030 under Mission 300
Up to 720 million	People who faced hunger in 2024, as the Declaration notes
40	Countries in which the existing IBSA Fund has supported projects; this is not the newly proposed fund

4. Three common exam traps

1. **“G20” is a name, not a count.** There are 19 countries and two regional organisations, 21 members in all. The African Union came in at the New Delhi summit of 2023, not at Johannesburg. What was new at Johannesburg was the place: the first Leaders’ Summit on African soil, under the first African presidency. Rio de Janeiro in 2024 was the first full summit with the African Union as a member. Guest countries such as Spain are invited by the presidency; they are not members.
2. **1999, 2008 and 2009 mark three different things.** In 1999 the G20 was created, at the level of finance ministers and central bank governors. In 2008 it was raised to the level of leaders, who met at Washington, D.C. in November of that year. In 2009 the G20 was designated the premier forum for international economic cooperation. The G20 still has no permanent secretariat; the presidency runs the work for a year.
3. **The Johannesburg Declaration was not adopted at the close, and not by every member.** It was adopted at the beginning of the summit on 22 November 2025. The United States was absent, and Argentina, though present, did not subscribe to it. The US State Department’s statement of 3 December 2025 says that the Government of South Africa will not be invited during the United States presidency. Do not mix this up with Johannesburg: that statement is about the United States presidency of 2026 and its summit, not about the Johannesburg summit of 2025.

7. Sources

7.1 Sources

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What the G20 is; the list of 19 countries, the European Union and the African Union; the shares of global GDP, international trade and world population; no permanent secretariat or staff; the rotating presidency and the troika; the theme of South Africa’s presidency

S2 Website of India’s G20 presidency (Government of India), “About G20”. https://www.g20.in/en/about-g20/about-g20.html

Upgrade to the level of Heads of State or Government after the crisis of 2007; “premier forum” in 2009; members; shares of GDP, trade and population; no permanent secretariat; presidency and troika (Indonesia, India and Brazil in 2023; India, Brazil and South Africa in 2024); Finance Track and Sherpa Track; engagement groups; the Washington, D.C. summit of 14 and 15 November 2008; the Rome summit of 2021 and its motto;

the Bali summit (17th); the New Delhi summit (18th, Bharat Mandapam); the African Union as a permanent member; India's presidency from 1 December 2022 to 30 November 2023

S3 Encyclopaedia Britannica, "Group of 20 (G20)", as updated on 25 June 2026. https://www.britannica.com/topic/Group-of-20

Creation in 1999 in response to the economic crises of the late 1990s; finance ministers and central bank governors; first meeting on 15 and 16 December 1999; emergency summit of November 2008; 21 members (19 countries and 2 regional organisations)

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S6 Press Information Bureau (Prime Minister's Office), "Prime Minister participates in India-Brazil-South Africa (IBSA) Leaders' Meeting in Johannesburg", 23 November 2025, Release ID 2193135. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2193135

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S7 United States Department of State, "America Welcomes a New G20" by Secretary of State Marco Rubio, 3 December 2025: English original, https://statedept.substack.com/p/america-welcomes-a-new-g20 ; the Department's Chinese translation, which carries the date, https://www.state.gov/translations/chinese/20251203-america-welcomes-a-new-g20/

The United States as host in 2026, the first time since 2009; the three priorities; the Leaders' Summit at Miami, Florida in December 2026; Poland invited; the Government of South Africa not to be invited, and the reasons the statement gives

S8 South African G20 presidency, opening statement and summit documents: https://www.g20.org.za/g20-media/statement-by-president-cyril-ramaphosa-at-the-opening-of-the-g20-leaders-summit/ ; official delegation and handover sources in S17–S22

20th summit, first African presidency, theme and adoption at opening; official sources below establish representation and actual handover

S9 US Treasury, "Secretary Bessent Announces 2026 G20 Finance Track Agenda", 19 February 2026. https://home.treasury.gov/news/press-releases/sb0398

Scheduled 2026 summit: 14–15 December at Trump National Doral, Miami, Florida

S10 Wikipedia, "2023 G20 New Delhi summit", https://en.wikipedia.org/wiki/2023_G20_New_Delhi_summit , which cites the Ministry of External Affairs ("G20 New Delhi Leaders' Declaration"), the G20 website ("Launch of the Global Biofuel Alliance (GBA)"), Mint (16 November 2022), India Today and Hindustan Times (9 September 2023), AP News (9 September 2023), Reuters and Indian Express (10 September 2023)

First G20 summit in India; the theme in Sanskrit and English; Indonesia as the previous presidency; the New Delhi Leaders' Declaration adopted by consensus; the Global Biofuels Alliance; the India-Middle East-Europe Economic Corridor

S11 Wikipedia, “2024 G20 Rio de Janeiro summit”, https://en.wikipedia.org/wiki/2024_G20_Rio_de_Janeiro_summit , which cites President Lula da Silva’s announcement of 10 September 2023 for the motto and the priorities

19th summit at Rio de Janeiro on 18 and 19 November 2024; the motto of Brazil’s presidency; Brazil’s presidency from 1 December 2023; the first full summit with the African Union as a member

S12 The institute’s current affairs file: Insights “Current Affairs 30”, November 2025, “G20”, page 123

Selection of the item only. The facts in the notes are taken from the other sources in this table

S13 Prime Minister of India (official website), “Visit of PM to Indonesia for the G20 Summit”, 10 November 2022. https://pmindia.gov.in/en/news_updates/visit-of-pm-to-indonesia-for-the-g20-summit

The 17th G20 Summit at Bali; its theme “Recover Together, Recover Stronger”; India assuming the presidency on 1 December 2022

S14 Prime Minister of India (official website), “Unveiling of The Logo, Theme and Website of India’s G20 Presidency”, 8 November 2022. https://www.pmindia.gov.in/en/news_updates/unveiling-of-the-logo-theme-and-website-of-indias-g20-presidency/

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S15 Government of Brazil, G20 Brasil 2024 website, “Slogan and logo”. https://www.gov.br/g20/en/about-the-g20/slogan-and-logo

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S18 Argentina Foreign Ministry, 22 November 2025. https://www.cancilleria.gob.ar/en/announcements/news/argentine-republic-did-not-join-final-document-circulated-during-g20-leaders

Argentina’s non-adherence and its own stated procedural and substantive reasons

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Officially scheduled dates and venue of the 2026 summit; supersedes S9’s press-based schedule

S20 President Ramaphosa’s opening statement, 22 November 2025. https://www.g20.org.za/g20-media/statement-by-president-cyril-ramaphosa-at-the-opening-of-the-g20-leaders-summit/

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Representation in section 2.5, replacing speculative accounts of reasons for absence