Day 25 | Complete teaching notes and sources

English

IAS with Dr Ravi · APPSC Group 1 · 1,000 Topics in 100 Days

Topics 241–250. Updated 31 October 2026. Pictographs are supplied separately; these notes preserve the full teaching sequence.

Topic	Contents
241	Tughlaqs: Muhammad bin Tughlaq's experiments and Firoz Shah
242	Andhra Pradesh welfare schemes: purpose, eligibility and delivery accountability
243	Land reforms: abolition of intermediaries, tenancy and ceilings
244	Literacy in India: levels and regional differences
245	Himalayan rivers: Indus, Ganga and Brahmaputra systems
246	Disaster management: Disaster Management Act 2005 and the institutional framework
247	Artificial intelligence and machine learning
248	Classification: odd one out
249	Data interpretation: pie charts
250	Current affairs: Chabahar port and India's connectivity with Iran and Central Asia

Topic 241 | Tughlaqs: Muhammad bin Tughlaq's experiments and Firoz Shah

1. Concept in one line

The Tughlaq dynasty (1320 to 1414 in NCERT) ruled the Delhi Sultanate through the bold but failed measures of Muhammad bin Tughlaq and the long reign of Firoz Shah, remembered for canals, new towns, charities and a huge body of slaves. The examination asks for the dates, aim and fate of each of Muhammad's measures, the kingdoms that broke away, Firoz's departments and works, and the chroniclers of the period.

2. Revision notes

Source clarification, 31 October 2026: NIOS Lesson 9 is internally inconsistent on the dynasty transition: p.144 gives the Tughlaqs ending in 1412, whereas p.146 heads section 9.7 "Sayyid Dynasty (1414–1450 AD)". Do not treat 1412 as an uncontested transition date. The supplied NCERT chronology gives 1414. Neither MCQ depends on this discrepancy. Official NIOS PDF: https://digital.nios.ac.in/content/315en/315_History_Eng_Lesson9.pdf.

2.1 Where this topic fits, and the dynasty

- **Recall Topic 181:** Alauddin Khalji (1296 to 1316) paid a large standing army in cash and fixed prices in Delhi to make it possible. **Topic 2:** the Tughlaq army under Ulugh Khan took Warangal in 1323 and ended Kakatiya rule. **Topic 22:** Harihara and Bukka founded Vijayanagara in 1336.
- **Spelling:** NCERT writes Tughluq and Firuz; this topic writes Tughlaq and Firoz, as in its title. They are the same names.

Ruler	Years	Points to remember
Ghiyasuddin Tughlaq (Ghazi Malik)	1320 to 1324 in NCERT; 1320 to 1325 in Britannica and NIOS	Founded the dynasty in 1320 after killing Khusrau Khan (Topic 181). Built the fort city of Tughlaqabad from 1321, meant to keep out the Mongols. Sent his son Ulugh Khan against Warangal. Killed when a wooden shelter collapsed on him at Afghanpur, near Delhi; some historians suspected Muhammad, but this was never proved (Britannica)

Ruler	Years	Points to remember
Muhammad bin Tughlaq (Ulugh Khan, also called Jauna Khan)	1324 to 1351 in NCERT; 1325 to 1351 in Britannica	Son of Ghiyasuddin. Britannica counts 22 rebellions in his reign. Died on 20 March 1351 in Sind while chasing the rebel Taghi
Firoz Shah Tughlaq	1351 to 1388	Cousin of Muhammad: his father, Rajab, was a brother of Ghiyasuddin (Wikipedia). Raised to the throne on 23 March 1351 on the banks of the Indus; died on 20 September 1388
The later Tughlaqs	1388 to 1414 in NCERT	Five Sultans in about 25 years (Wikipedia): Ghiyasuddin II, Abu Bakr, Nasiruddin Muhammad Shah, Sikandar Shah and Nasiruddin Mahmud. Timur sacked Delhi in 1398. Khizr Khan founded the Sayyid dynasty: NCERT dates it from 1414. NIOS p144 ends the Tughlaq period at1412, while its Sayyid section p146 begins at1414

2.2 Muhammad bin Tughlaq: the measures

NCERT (earlier edition of the Class VII book) compares him with Alauddin Khalji. The Sultanate was attacked by the Mongols early in his reign and the Mongol army was defeated. He then raised a large standing army, emptied the oldest of the four cities of Delhi (Dehli-i Kuhna) to garrison his soldiers there, and sent its residents to Daulatabad. He paid his soldiers in cash, but instead of controlling prices as Alauddin did, he used a “token” currency. NCERT’s verdict: his administrative measures were a failure.

Measure	Aim (as the sources give it)	What happened	Why it failed or ended
Daulatabad (Devagiri) made a second capital, 1327	To hold the southern conquests by moving people from Delhi (Britannica); NCERT links it to garrisoning soldiers in old Delhi	Mainly nobles, religious men and craftsmen were moved, on a hard journey (NIOS). The Sultan later gave Daulatabad up; Wikipedia dates the return to Delhi to 1335	NCERT: the shift was resented. Britannica: he had to move back to Delhi to put down rebellions by his nobles; NIOS adds the difficulty of ruling the north from the south. Britannica adds that the move left a lasting mark in the Deccan, including the spread of Urdu

Measure	Aim (as the sources give it)	What happened	Why it failed or ended
Token currency, about 1330 (Wikipedia)	NCERT: to pay the army in cash. Barani blames an empty treasury; some historians point to a worldwide shortage of silver (NIOS)	Coins of cheap metal were given the value of silver coins (see the box below)	Forged coins flooded the markets (NIOS); the currency had to be recalled (NCERT), and the Sultan bought the coins back at great expense (Wikipedia)
Higher land revenue demand in the Doab, 1328-29 (Britannica)	NCERT: to meet the cost of the large army	The peasants resisted, and a severe drought made it worse (Britannica). Peasants fled their land (Wikipedia)	NCERT: higher taxes and famine in the Ganga-Yamuna belt led to widespread rebellion
Khurasan expedition, planned 1327-28 (Britannica)	To conquer Khurasan and Transoxiana; Britannica suggests it may also have been meant to secure horses and precious metals	A huge army was raised (Barani: 3,70,000 horsemen were enrolled)	It never took place. NCERT: he gave up the plan to invade Transoxiana and disbanded his large army; Barani says the army went unpaid and broke up
Qarachil expedition (Britannica: Karajil, in Garhwal-Kumaon, 1329-30; Wikipedia: Kumaon, 1333; NIOS: in present-day Himachal)	Britannica: to settle a boundary dispute with the hill states. Later writers (Badauni, Firishta) say he meant to cross the Himalayas into China	The army was sent into the hills and was nearly wiped out (Wikipedia: almost all of about 1,00,000 men)	Britannica: it “ended in disaster”, and an exchange of envoys with China followed
A department of agriculture, the Diwan-i-Amir-i-Kohi (NIOS: Diwan-i Kohi)	To extend and improve cultivation	Loans to peasants for seed and after crop failure (NIOS). Britannica credits him with crop rotation, state farms and better irrigation, and calls him the first Indian ruler on record to give loans (taccavi) to villagers after a famine	Barani says the officers spent much of the loan money on themselves; Firoz later wrote off the loans (Britannica)

- **The metal of the token coins:** NCERT says only “cheap metals, not gold and silver”, like present-day paper currency. Britannica says only “coins of baser metal”. NIOS says copper (a copper jital in place of the silver tanka), and Barani speaks of the Sultan’s “copper money”; Wikipedia says brass and copper. In an NCERT-based question, the safe answer is a cheap metal of lower value than silver; where the options name a metal, copper is the one in NIOS and Barani.

- **NCERT's two other points:** "His campaign into Kashmir was a disaster"; and yet, "for the first time" in the Sultanate's history, a Delhi Sultan planned a campaign to capture Mongol territory instead of only defending against it. NCERT does not name the Qarachil expedition. The books that do name it place it in Garhwal-Kumaon or Himachal (table above), not in Kashmir. For a question on Qarachil, go by the table above.
- **Famine relief:** during the famine of 1338 to 1340 he moved his camp to Swargadwari (near Kanauj) to oversee relief himself (Britannica).

2.3 Ibn Battuta

A Moroccan from Tangier, he reached the Indus on 12 September 1333, went to Delhi and was appointed a qazi (judge) of Delhi by Muhammad bin Tughlaq. He stayed about six years and was then sent as the Sultan's envoy to China (1342 in NCERT). His account of his travels is the Rihla.

2.4 Revolts and the kingdoms that broke away (under Muhammad)

- **Ma'bar (Madurai):** the governor declared independence and founded the sultanate of Madurai, by 1335 in Britannica; Wikipedia gives 1334 and names him Jalaluddin Ahsan Khan.
- **Vijayanagara, 1336:** founded by Harihara and Bukka (Topic 22); Britannica calls it the most important of the new Hindu states.
- **Bahmani kingdom, 1347:** Britannica lists rebellions at Gulbarga (1339), Warangal (1345-46) and Daulatabad, which led to the founding of the Bahmani sultanate in 1347 by Alauddin Hasan Bahman Shah (Hasan Gangu).
- **Bengal:** by 1338 separate sultans ruled its three regions, among them Fakhruddin Mubarak Shah at Sonargaon (Wikipedia). NIOS says Bengal cut its link with Delhi. Firoz's campaigns of 1353-54 and 1359 failed to win it back (Britannica); NIOS says a treaty with Haji Ilyas made the river Kosi the boundary.
- **The end of his reign:** Britannica says he spent his last five years fighting a rebellion in Gujarat.

2.5 Firoz Shah Tughlaq: the policies

Measure	What it was or did	Points to remember
Jizya and religious policy	He refused to exempt the Brahmins from the jizya (Britannica). The Brahmins of Delhi fasted at the palace in protest (Afif); the Hindus of the city then agreed to pay their share (Self Study History)	He banned taxes not sanctioned by the sharia, had temples pulled down and barred Muslim women from visiting saints' tombs (his own Futuhat names all three). He also had Sanskrit works translated into Persian (Britannica)
Canals	Britannica: he "created the biggest network of canals known in premodern India"	Five canals (Wikipedia), among them one from the Yamuna to Hisar and one from the Sutlej to the Ghaggar (Drishti); the old Western Yamuna Canal was renewed

Measure	What it was or did	Points to remember
New towns	Firozabad (1354), his new capital at Delhi, of which Kotla Firoz Shah is the citadel; Hisar (1356 in Britannica); Jaunpur and Fatehabad	Wikipedia and Drishti name all four
Diwan-i-Khairat	A department of charity	It paid for the marriages of poor girls (Wikipedia; Afif says it was set up "for the promotion of marriages") and helped orphans and widows (Self Study History)
Diwan-i-Bandagan	A department for slaves	Some slaves were trained as artisans; the rest formed a separate force with its own officers and treasury (Self Study History)
Dar-ul-Shifa	A hospital where the poor were treated free	Firoz names it (Daru-sh shifa) in his own Futuhat
Hereditary posts and assignments	Sons could succeed their fathers in office and in their iqtas or jagirs; soldiers could send substitutes	Britannica: hereditary appointments and a fixed land tax in place of a share of the crop. The iqta system is taken up in Topic 452
Two Ashokan pillars	One from Topra (Yamunanagar district, Haryana) was set up again at Firozabad, on top of a three-storey building, in 1356; one from Meerut was set up on the Ridge, near his hunting palace (Wikipedia)	Britannica says he placed an Ashokan pillar on the roof of his palace. Afif describes how the Topra pillar was carried to Delhi
Futuhat-i-Firozshahi	His own short account of his reign	Also spelt Fatuhat-i-Firozshahi

- **Milder rule:** he lowered the land taxes raised under Muhammad and abolished harsh punishments such as cutting off limbs (Wikipedia).

Primary-account clarification: Afif describes the Diwan-i-Khairat marriage allowances specifically for daughters in needy Muslim families, following enquiry. This is the stated scope of that account, not evidence of a modern universal entitlement.

2.6 How the books judge the two Sultans

- **Muhammad:** NCERT says that by the end of his reign the Sultanate had reached its greatest extent, calls his administrative measures a failure, but notes his plan to carry the war into Mongol territory. Britannica's article on the dynasty says he briefly extended the Sultanate over most of the subcontinent but lost the south. Britannica also calls his reign the high point of the Sultanate and the beginning of its decline.

- **Firoz:** Self Study History says his reforms were popular but weakened the central government in the long run, and that the slave force split the administration. Within ten years of his death Timur sacked Delhi, and the dynasty ended in 1414 (NCERT).

2.7 The chroniclers and other authors of the period

Author	Work	What to remember
Ziauddin Barani (1285 to 1357)	Tarikh-i-Firoz Shahi (about 1357); Fatawa-i-Jahandari	A companion (nadim) of Muhammad for 17 years; NCERT calls him a mid-fourteenth-century chronicler. He wrote both works after Muhammad's death, hoping for Firoz's favour. The Fatawa-i-Jahandari is advice on the ideals a Muslim ruler should follow (Wikipedia)
Ibn Battuta	Rihla	Eyewitness of Muhammad's court (2.3)
Shams-i-Siraj Afif	Tarikh-i-Firoz Shahi	A history of Firoz's reign with the same title as Barani's
Firoz Shah Tughlaq	Futuhat-i-Firozshahi	The Sultan's own account

3. Extra section: a chronology of the Tughlaq years

Year	Event
1320	Ghiyasuddin Tughlaq takes the throne
1321	Tughlaqabad begun
1323	Ulugh Khan takes Warangal; Kakatiya rule ends (Topic 2)
1324 or 1325	Muhammad bin Tughlaq succeeds (NCERT 1324; Britannica 1325)
1327	Daulatabad made a second capital
1327-28	Khurasan expedition planned (Britannica)
1328-29	Higher land revenue demand in the Doab (Britannica)
About 1330	Token currency issued
1329-30 or 1333	Qarachil expedition (Britannica or Wikipedia)
1333	Ibn Battuta reaches the Indus
1334 or 1335	Madurai breaks away
1335	Return of the capital to Delhi (Wikipedia)
1336	Vijayanagara founded

Year	Event
1338	Bengal ruled by separate sultans
1338 to 1340	Famine; the Sultan's camp at Swargadwari
1347	Bahmani kingdom founded
1351	Muhammad dies on 20 March; Firoz Shah raised to the throne on 23 March
1354	Firozabad founded
1356	Topra pillar set up at Firozabad; Hisar founded (Britannica)
1359	Firoz's second failed campaign in Bengal
1388	Firoz dies on 20 September
1398	Timur sacks Delhi
1414	Khizr Khan founds the Sayyid dynasty (NCERT; NIOS Sayyid section p146 also starts at1414; its earlier Tughlaq overview p144 ends at1412)

What the chronology shows:

- The great measures of Muhammad were crowded into his first ten years (1327 to about 1335). The break-away kingdoms followed them.
- The south was lost within about 25 years of the conquest of Warangal: Madurai, Vijayanagara and the Bahmani kingdom all arose between 1334 and 1347.
- Firoz added no new territory (NIOS); his long reign of 37 years was one of building and charity, and within ten years of his death Timur sacked Delhi.

4. Three common exam traps

1. **1324 or 1325?** NCERT's table ends Ghiyasuddin's reign and begins Muhammad's in 1324; Britannica and NIOS give 1325. In an NCERT-based question use 1324. In the same way NCERT ends the Tughlaqs in 1414, NIOS in 1412.
2. **The token coins were not silver or gold.** NCERT says cheap metals; Britannica says baser metal; NIOS and Barani say copper; Wikipedia says brass and copper. Whatever the metal, the coins were forged on a large scale and the scheme was withdrawn in Muhammad's own reign.
3. **The break-away kingdoms came under Muhammad, not Firoz.** Madurai (1334 or 1335), Vijayanagara (1336) and the Bahmani kingdom (1347) all broke away before 1351, and Bengal was under separate rulers by 1338. Firoz only tried, and failed, to win Bengal back.

7. Sources

7.1 Sources

No.	Source	Used for
S1	NCERT, *Our Pasts II* (Class VII history), Chapter 3, "Delhi: 12th to 15th Century" (current edition). https://ncert.nic.in/textbook/pdf/gess103.pdf	Table of dynasties and rulers with years (Tughluqs 1320-1414; Ghiyasuddin 1320-1324; Muhammad 1324-1351; Firuz Shah 1351-1388; Sayyids 1414-1451); expansion of the Sultanate by the end of Muhammad Tughluq's reign; Mongol attacks and the large standing army; the officers of humble birth and Barani's comment on them; Barani as a mid-fourteenth-century chronicler
S2	NCERT, *Our Pasts II* (Class VII history), Chapter 3, "The Delhi Sultans" (earlier edition, 2020-21 reprint), pp. 31 to 42, school mirror of the NCERT chapter. https://ssgopalganj.in/online/Class%20VII/S%20Sc/Our%20Past%20II/ch3.pdf	The same dynasty table; the box comparing Alauddin Khalji and Muhammad Tughluq: Mongols defeated early in his reign, the large army, Dehli-i Kuhna emptied and its residents sent to Daulatabad, additional taxes, cash salaries and the token currency of cheap metals, the Kashmir campaign, Transoxiana given up and the army disbanded, the resented shift, taxes and famine in the Ganga-Yamuna belt, the recall of the currency, the failure of the measures and the first plan to capture Mongol territory; Firuz Shah's tomb

No.	Source	Used for
S3	National Institute of Open Schooling (NIOS), Senior Secondary History (315), Lesson 9, "Establishment and Expansion of the Delhi Sultanate". https://www.nios.ac.in/media/documents/SrSec315NEW/315_History_Eng/315_History_Eng_Lesson9.pdf	Ghiyasuddin's accession in 1320 and death in 1325; the Tughlaqs to 1412; Deogir renamed Daulatabad, nobles, religious men and craftsmen moved, the hard journey and the abandonment; the copper jital for the silver tanka, Barani's empty treasury and the silver shortage, forgery and withdrawal; the Diwan-i Kohi and its loans; Qarachil (in present-day Himachal) and its failure; the difficulty of ruling the north from the south; Ma'bar, Bengal, Vijayanagar and the Bahmanis; Firoz adding no territory, the Bengal treaty and the Kosi boundary; Timur's 15 days in Delhi, the massacre, Nasiruddin and Mallu Iqbal, Khizr Khan
S4	Encyclopaedia Britannica, "India", section "The Tughluqs". https://www.britannica.com/place/India/The-Tughluqs	Ghiyath al-Din's reign 1320-25 and death at Afghanpur; Muhammad's reign 1325-51 as the high point and beginning of decline; Daulatabad as second capital in 1327 and the move back to Delhi to crush the nobles' rebellions; token money; taccavi loans after famine and Firuz writing them off; proposed Khurasan and Himalayan expeditions and the horses and precious metals; Madura by 1335, Vijayanagar, Gulbarga 1339, Warangal 1345-46, Bahmani 1347; the last five years in Gujarat; Firuz 1351-88, his Bengal campaigns, the jizya and the Brahmins, canals, fixed tax, hereditary appointments, slaves, charities, the Ashokan pillar on his palace roof, Persian translations

No.	Source	Used for
S5	Encyclopaedia Britannica, “Muhammad ibn Tughluq”. https://www.britannica.com/biography/Muhammad-ibn-Tughluq	Reign 1325-51 and 22 rebellions; Deogir in 1327 and the spread of Urdu; coins of baser metal at silver value; Doab tax in 1328-29 and the drought; famine of 1338-40 and Swargadwari; Khurasan 1327-28 never taking place; Karajil (Garhwal-Kumaon) 1329-30, the boundary dispute, the disaster and the envoys to China; crop rotation, state farms and the agriculture department; death on 20 March 1351 at Sonda while fighting Taghi; the reasons for his failure
S6	Encyclopaedia Britannica, “Firuz Shah Tughluq”. https://www.britannica.com/biography/Firuz-Shah-Tughluq	Reign 1351-88 and cousinship; failure to recover Bengal; Kotla Firuz Shah; Hisar founded in 1356
S7	Encyclopaedia Britannica, “Tughluq dynasty”. https://www.britannica.com/topic/Tughluq-dynasty	Muhammad briefly extending the Sultanate over most of the subcontinent and losing the south; cross-check of the reign 1325-51
S8	National Monuments Authority, list of protected monuments of the Delhi Circle of the Archaeological Survey of India (ASI). https://www.nma.gov.in/WriteReadData/RTF1984/1682685196.pdf	Tughlaqabad Fort, the tomb of Ghiyasuddin Tughlaq, Kotla Firoz Shah (Firozabad) and the Ashokan pillars at Firoz Shah Kotla and on the Northern Ridge as ASI-protected monuments
S9	Wikipedia, “Muhammad bin Tughluq” (citing R.C. Majumdar, *The Delhi Sultanate*, 1960; Satish Chandra, *Medieval India*, 1997 and 2004; K.R. Qanungo, 1960; Jamal Malik, 2008). https://en.wikipedia.org/wiki/Muhammad_bin_Tughluq	Accession on 4 February 1325; death on 20 March 1351 on the way to Thatta; Daulatabad in 1327 and the return in 1335; brass and copper coins about 1330 and their collapse; the army of possibly 3,70,000 and Barani on its dispersal; Qarachil in Kumaon in 1333, the loss of about 1,00,000 men, Badauni and Firishta on China; Jalaluddin Ahsan Khan and Madurai in 1334; Hasan Bahman Shah and 1347

No.	Source	Used for
S10	Wikipedia, "Tughlaq dynasty" (citing Peter Jackson, *The Delhi Sultanate*, 1999 and 2003; Satish Chandra, *Medieval India*, 1997; Agha Mahdi Husain, *Tughluq Dynasty*, 1963). https://en.wikipedia.org/wiki/Tughlaq_dynasty	The later rulers and their years; Muhammad's other name Jauna Khan; Tughlaqabad against the Mongols; buying back the token coins; peasants fleeing the Doab; Timur in 1398 and Khizr Khan
S11	Wikipedia, "Firuz Shah Tughlaq" (citing Satish Chandra, *Medieval India*: *From Sultanat to the Mughals*, 2005; Peter Jackson, 1999; Elliot and Dowson's translation of the *Futuhat-i-Firoz Shahi*, 1871). https://en.wikipedia.org/wiki/Firuz_Shah_Tughlaq	His father Rajab; accession on 23 March 1351 and death on 20 September 1388; Muslim women barred from tombs; towns (Firozabad, Hisar, Jaunpur, Fatehabad and others); five canals and the Western Yamuna Canal; hereditary posts and jagirs, substitutes in the army; lower taxes and the end of mutilation; hospitals for the poor; the Diwan-i-Khairat and marriages of poor girls; pillars from Topra and Meerut; translations from Sanskrit; Afif as a source
S12	Wikipedia, "Ibn Battuta" (citing Ross Dunn, *The Adventures of Ibn Battuta*, 1986). https://en.wikipedia.org/wiki/Ibn_Battuta	Tangier; the Indus on 12 September 1333; appointment as qadi; about six years in Delhi; the embassy to China (1341 or 1342); the Rihla dictated to Ibn Juzayy and completed in 1355
S13	Wikipedia, "Ziauddin Barani". https://en.wikipedia.org/wiki/Ziauddin_Barani	Dates 1285-1357; nadim of Muhammad for 17 years; the two works written in exile to win Firoz's favour; Tarikh-i-Firoz Shahi of 1357; Fatawa-i-Jahandari as advice on a Muslim ruler's ideals
S14	Wikipedia, "Tughlaqabad Fort" (citing Amrit Verma, *Forts of India*, Publications Division, 1985). https://en.wikipedia.org/wiki/Tughlaqabad_Fort	Built from 1321 by Ghiyasuddin to ward off the Mongols
S15	Wikipedia, "Delhi-Topra pillar" (citing Y.D. Sharma, *Delhi and its Neighbourhood*, ASI, 2001; Upinder Singh, 2006). https://en.wikipedia.org/wiki/Delhi-Topra_pillar	Topra Kalan in Yamunanagar district; the three-storey building at Firozabad; the Meerut pillar on the Ridge near the hunting palace; Shams-i-Siraj's account of the transport

No.	Source	Used for
S16	Wikipedia, “Feroz Shah Kotla” (citing Sailendra Sen, 2013; Amrit Verma, 1985). https://en.wikipedia.org/wiki/Feroz_Shah_Kotla	Firozabad founded in 1354 and Kotla as its citadel; the Topra pillar re-erected in 1356
S17	Wikipedia, “Bengal Sultanate” (citing Kunal Chakrabarti, 2013). https://en.wikipedia.org/wiki/Bengal_Sultanate	Separate sultans by 1338, Fakhruddin Mubarak Shah at Sonargaon; Firoz’s campaigns of 1353 and 1359
S18	Drishti IAS, “The Delhi Sultanate-III: The Tughlaq Dynasty (1320-1413)” (study notes, 29 August 2023). https://www.drishtiias.com/to-the-points/paper1/the-delhi-sultanate-iii-the-tughlaq-dynasty-1320-1413/print_manually	Swargadwari near Kanauj; the Diwan-i-amir-i-kohi; Firoz’s canals (Yamuna to Hissar, Sutlej to Ghaggar); towns; Diwan-i-Khairat as charity office; Diwan-i-Bandagan as the department of slaves; hereditary iqtas
S19	Self Study History, “Firuz Tughluq: agrarian measures, achievements in civil engineering and public works, decline of the Sultanate, part I” (study compilation, 27 March 2020). https://selfstudyhistory.com/2020/03/27/firuz-tughluq-agrarian-measures-achievements-in-civil-engineering-and-public-works-decline-of-the-sultanate-part-i/	The Brahmins’ hunger strike over the jizya; taxes not sanctioned by the sharia; temples and tombs; the Diwan-i-Khairat for orphans and widows; hereditary iqtas; wajh; 1,80,000 slaves and 12,000 artisans; the Futuhat as autobiography; the weakening of the central government
S20	PW Only IAS, “Tughlaq Dynasty” (Udaan study notes). https://pwonlyias.com/udaan/tughlaq-dynasty-medieval-india/	Bronze token coins in some study guides; the Diwan-i-Bandagan; Dar-ul-Shifa hospitals for the poor; Diwan-i-Khairat for marriages of poor girls; two pillars from Meerut and Topra
S21	Civilsdaily, “[Prelims Spotlight] Sarkar, Sondhar” (study notes, 20 July 2018). https://civilsdaily.com/?p=107339	Sondhar as the name some study guides give to Muhammad bin Tughluq’s loans to peasants
S22	NCERT, *Themes in Indian History*, *Part II* (Class XII), “Through the Eyes of Travellers”. https://ncert.nic.in/textbook/pdf/lehs201.pdf	Ibn Battuta: born in Tangier; reached Sind in 1333; appointed qazi (judge) of Delhi by Muhammad bin Tughluq and held the post for several years; ordered to China in 1342; the Rihla, written in Arabic

No.	Source	Used for
S23	H.M. Elliot and John Dowson, *The History of India, as Told by Its Own Historians*, Vol. III (1871): Barani's *Tarikh-i Firoz Shahi*, Shams-i Siraj Afif's *Tarikh-i Firoz Shahi* and the *Futuhat-i Firoz Shahi* (translated extracts). https://persian.packhum.org/text/080201013	Barani: 3,70,000 horsemen enrolled for Khurasan, the countries not acquired and the unpaid army breaking up; the force sent into the Karachil mountains destroyed; the Doab cesses, flight of the peasants and famine; the "copper money" and its repeal; loan money misused by the officers. Afif: the diwan-i khairat "for the promotion of marriages"; the jizya never before levied from the Brahmans and their fast at the palace. The Futuhat as the work of Sultan Firoz Shah himself; his Daru-sh shifa (hospital); illegal taxes abolished; temples destroyed; women barred from visiting tombs

Topic 242 | Andhra Pradesh welfare schemes: purpose, eligibility and delivery accountability

1. Concept in one line

Andhra Pradesh runs welfare schemes that give cash, free goods or free services to groups defined by eligibility rules, and it delivers them through local secretariats, Aadhaar-based checks, a grievance portal and audit. The examination asks what each scheme gives and to whom, how an application is checked and sanctioned, and what official reviews say about cost and targeting.

2. Revision notes

Dated primary-source check —31 October2026

The signed pension memo of 6 September2026 has been checked directly: recommendation is not sanction; SERP issues sanction subject to Government approval and budget, and payment is not retrospective. The Sixteenth Finance Commission VolumeI, printed p.303, paragraph14.34, confirms **9.0 per cent ineligible and 0.6 per cent found dead in verification covering one village/ward secretariat in each district**. This is the scope of that verification, not a measured prevalence estimate for every pension beneficiary in the State. Printed p.300, paragraph14.26, gives Rs5,061 per-capita social-security pension expenditure as **2025–26BE**, not actual expenditure. The Budget speech of14February2026, paragraph58, reports **1.08crore women beneficiaries** under Deepam2.0. The83lakh figure in the2024–25Survey below is an older source snapshot with different wording; do not present it as the latest count or silently equate families with women beneficiaries. Paragraph32 describes Thalliki Vandanam as **Rs15,000 per child annually**. Annadatha Sukhibhava figures below are explicitly the Budget speech's report, not a fresh disbursement audit; no derived total is asserted. Sources: https://www.indiabudget.gov.in/doc/16fcvol1.pdf ; https://apfinance.gov.in/...Bud@et26-27/documents/SpeechEnglish.pdf ; the signed pension memo in sourceS4.

2.1 What earlier topics settled

- **Topic 214:** the National Food Security Act, 2013 and the public distribution system (PDS) give grain, now free, through fair price shops to holders of a ration card; Andhra Pradesh procures and distributes its own rice.
- **Topic 93:** poverty is measured by a poverty line of monthly consumption expenditure and by the multidimensional poverty index (MPI).
- **Topic 164:** the State Budget 2026-27 was presented on 14 February 2026 by the Finance Minister, Payyavula Keshav; its fiscal deficit of 3.8 per cent of the Gross State Domestic Product (GSDP) is above the 3 per cent limit that the Sixteenth Finance Commission recommends.

- Left to other days: welfare expenditure and fiscal constraints (Topic 414); central schemes (Topics 583, 783 and 982).

2.2 The main schemes and their 2026-27 allocations

The allocations are Budget Estimates (BE) for 2026-27, as analysed by PRS Legislative Research (11 March 2026). The descriptions are those of the official source named in each row.

Scheme	What it gives, and to whom	Budget 2026-27 allocation and head
NTR Bharosa pension scheme	Monthly social security pensions to listed groups; amounts as enhanced by G.O.Ms.No.43 of 13 June 2024 (see 2.3)	Rs 27,719 crore
Talliki Vandanam	Rs 15,000 a year for school-going children of classes 1 to 12, from 2025-26 (PRS, Budget 2025-26). The Socio-Economic Survey 2024-25 describes it as Rs 15,000 annually to mothers of school-going children	Rs 8,456 crore, under welfare of SC, ST, OBC and minorities
Annadata Sukhibhava	Released together with PM-KISAN, as "Annadatha Sukhibhava-PM Kisan": Rs 20,000 per farmer family in 2025-26, to 46.86 lakh farmer families (Budget Speech of 14 February 2026). PM-KISAN is a Central Sector scheme that gives land-holding farmer families income support of Rs 6,000 a year in three equal instalments (PIB)	Rs 6,600 crore, under agriculture
Stree Shakti	Free bus travel for women; introduced from 15 August 2025 (Budget Speech 2026-27)	Rs 1,420 crore, under transport
Deepam-2	Three free LPG cylinders a year to 83 lakh eligible families; launched in 2024 (Socio-Economic Survey 2024-25)	No separate figure in the PRS analysis
Anna Canteens	Affordable meals for the urban poor; 198 canteens working and six under construction, with 158 more planned in rural areas (Socio-Economic Survey 2024-25)	No separate figure in the PRS analysis

- The Budget 2026-27 also provides Rs 3,344 crore as subsidy on rice, and free power from 1 April 2026 for weavers: up to 200 units a month for handloom weavers and up to 500 units a month for power loom weavers (PRS).

- SC, ST and OBC stand for the Scheduled Castes, the Scheduled Tribes and the Other Backward Classes.

2.3 The NTR Bharosa social security pensions

G.O.Ms.No.43, dated 13 June 2024, enhanced the pension amounts. The scheme's portal gives the categories as follows.

Monthly amount	Categories (NTR Bharosa portal)
Rs 4,000	Older persons, widows, single women, weavers, toddy tappers, fishermen, persons living with HIV on antiretroviral therapy (ART), traditional cobblers, transgender persons and Dappu artists
Rs 6,000	Persons with disabilities, and persons with multi-deformity leprosy
Rs 10,000	Persons with specified chronic diseases, such as chronic kidney disease (on dialysis or not), recipients of a kidney, liver or heart transplant, and bilateral elephantiasis of grade 4

- The Sixteenth Finance Commission noted that Andhra Pradesh had the highest per capita expenditure on social security pensions, Rs 5,061 per head in 2025-26 (BE) (PRS).
- **Two different "pensions" in the Budget.** The Rs 27,719 crore for the NTR Bharosa scheme is a welfare allocation. The "pension" of Rs 23,713 crore in 2026-27 (BE), 10 per cent of revenue receipts, is a part of committed expenditure, alongside salaries and interest (PRS).

2.4 Eligibility and the checks on an application

A memo of the Panchayat Raj and Rural Development Department (No. 3407491/RD.I/A1/2026, dated 6 September 2026) lays down how new NTR Bharosa applications are taken "through Swarna Grama and Swarna Wardu".

- **Common eligibility** follows G.O.Ms.No.174, dated 13 December 2019.
- **For every category:** an Aadhaar card, and a rice card or an income certificate. For the old age pension the Aadhaar card serves as proof of age.
- **Proof for each category:**

Category	Proof required by the memo
Widow	The husband's death certificate and Aadhaar number
Single woman	A divorce decree, or a non-marriage certificate from the Tahsildar

Category	Proof required by the memo
Person with disability	A SADAREM certificate showing a benchmark disability of 40 per cent or more
Weaver	A certificate from the Handloom and Textiles Department
Fisherman	A certificate from the Fisheries Department
Dappu artist or traditional cobbler	A certificate from the Social Welfare Department
Toddy tapper	A certificate from the Prohibition and Excise Department
Transgender person	A certificate from the District Medical Board

- **Six checks at the mandal or municipal level:** the Mandal Parishad Development Officer (MPDO) or the Municipal Commissioner scrutinises (1) the applicant's details, (2) the supporting documents and certificates, (3) common eligibility, (4) the existing pensioners' database, (5) the physical verification report and (6) the eKYC details.

2.5 The delivery and accountability machinery

Mechanism	What the official source says
Aadhaar and electronic transfers	Aadhaar is required for every category. eKYC (electronic know your customer) is matched with the application at registration, or taken by the staff during physical verification (memo, 2026). The Sixteenth Finance Commission said that JAM, the linking of Jan Dhan bank accounts, Aadhaar and mobile numbers, "has helped reduce leakages in transfer programs such as pension schemes" (PRS)
Swarna Grama and Swarna Wardu offices	"Local government facilities" set up to decentralise administration (State portal). Staff named in the memo: the Digital Assistant and the Welfare and Education Assistant (WEA) in villages; the Ward Education and Data Processing Secretary (WEDPS) and the Ward Welfare and Development Secretary (WWDS) in wards
Eligibility checks	The documents and the six checks of 2.4, on which the MPDO or Municipal Commissioner decides eligibility and only recommends eligible applications. Before the final sanction, three bodies verify at the State level: the Swarna Grama and Swarna Wardu Department, the Real Time Governance Society (RTGS) and the Society for Elimination of Rural Poverty (SERP). The final validation is by the Chief Executive Officer (CEO) of SERP

Mechanism	What the official source says
Public Grievance Redressal System (PGRS)	The portal, titled "Centralized Public Grievance Redress And Monitoring System", lets a citizen raise an issue directly with the Chief Minister's Office, for himself or herself or for the household, and track its status; login is by an OTP sent to the Aadhaar-linked phone number. It runs under the Information Technology, Electronics and Communications Department
Dashboards	The Swarna Andhra Key Performance Indicators (KPI) Dashboard "will provide real-time tracking of performance indicators" (Socio-Economic Survey 2024-25)
Comptroller and Auditor General (CAG)	Article 151(2): the CAG's reports relating to the accounts of a State are submitted to the Governor, who causes them to be laid before the Legislature of the State

2.6 Issues raised by official and independent sources

Issue	What the source says
Fiscal cost	NTR Bharosa (Rs 27,719 crore), Talliki Vandanam (Rs 8,456 crore), Annadata Sukhibhava (Rs 6,600 crore) and Stree Shakti (Rs 1,420 crore) together come to Rs 44,195 crore, about 14.3 per cent of the expenditure of Rs 3,10,058 crore (excluding debt repayment) in the Budget 2026-27. NTR Bharosa alone is about 8.9 per cent (worked out from PRS figures)
Inclusion error (the ineligible on the list)	A State Government verification of pension beneficiaries, in one village or ward secretariat in each district, found that "9% of beneficiaries were ineligible and had been wrongly included", and that 0.6 per cent were dead (Sixteenth Finance Commission, quoted by PRS). The Commission said that "issues related to targeting remain"
Committed expenditure	Interest of Rs 37,281 crore (16 per cent of revenue receipts) and pensions of Rs 23,713 crore (10 per cent) in 2026-27; committed expenditure "limits the state's flexibility" to spend on other priorities (PRS)
Under-spending	Welfare of SC, ST, OBC and minorities: Rs 52,047 crore budgeted for 2025-26 but Rs 41,705 crore in the Revised Estimates; actual spending in 2024-25 was Rs 36,160 crore, 24 per cent below the budget (PRS)
Timing of new pensions	New pensions are sanctioned subject to Government approval and the release of budget, and are paid from the month of sanction, not retrospectively (memo, 2026)

3. Extra section: how a new pension application moves, step by step

Step	Who acts	What is done (memo of 6 September 2026)
1	Applicant	Applies at the Swarna Grama or Swarna Wardu office with the Aadhaar card, the rice card or income certificate, and the category proof
2	Digital Assistant (village) or WEDPS (ward)	Receives the application, verifies the basic details, uploads it; eKYC is matched at registration
3	WEA (village) or WWDS (ward)	Forwards eligible applications for physical verification
4	Swarna Grama or Swarna Wardu staff	Visit the applicant's residence and verify; take eKYC if it was not taken earlier. The WEA or WWDS uploads the result
5	MPDO or Municipal Commissioner; Tahsildar; district-level officers	The WEA or WWDS submits the application by category: single women to the Tahsildar, who verifies and sends it on to the MPDO or Municipal Commissioner; weavers, fishermen, Dappu artists, traditional cobblers, toddy tappers and transgender persons to the district-level officers concerned, and the State-level department concerned then finalises their eligibility; others to the MPDO or Municipal Commissioner, who runs the six checks and recommends. The memo says: "The MPDO shall not give any sanctions"
6	CEO, SERP	Final validation and budget proposals; SERP issues the sanction, subject to Government approval and budget
7	WEA or WWDS	Hands the acknowledgement, endorsement and sanction order to the applicant

Reading the chain: the Swarna Grama or Swarna Wardu office receives and verifies, the mandal or municipal officer only recommends, and the State-level society validates. The money starts in the month of sanction.

4. Three common exam traps

1. **Mixing up the two "pension" figures of the Budget.** The welfare allocation for the NTR Bharosa scheme in 2026-27 is Rs 27,719 crore. The "pension" of Rs 23,713 crore under committed expenditure is a different item, counted with salaries and interest. Quote each with its label.
2. **Thinking that Aadhaar alone proves eligibility.** Aadhaar proves identity, and for the old age pension it also proves age. Every applicant must also produce a rice card or an income certificate, and the common eligibility rules come from G.O.Ms.No.174 of 13 December 2019.
3. **Sending the State's audit report to the wrong place.** Under Article 151(2) the CAG's reports on the accounts of a State go to the Governor, who causes them to be laid before the Legislature of the State. Reports on the accounts of the Union go to the President and then to Parliament.

7. Sources

7.1 Sources

No.	Source	Used for
S1	PRS Legislative Research, "Andhra Pradesh Budget Analysis 2026-27" (web page). https://prsindia.org/budgets/states/andhra-pradesh-budget-analysis-2026-27	Budget presented on 14 February 2026 by Payyavula Keshav; expenditure of Rs 3,10,058 crore excluding debt repayment (Rs 3,32,205 crore in all); allocations for the NTR Bharosa pension scheme (Rs 27,719 crore), Thalliki Vandanam (Rs 8,456 crore, under welfare of SC, ST, OBC and minorities), Annadata Sukhibhava (Rs 6,600 crore, under agriculture), Stree Shakti (Rs 1,420 crore, free bus travel for women, under transport); rice subsidy Rs 3,344 crore; free power for weavers from 1 April 2026; under-spending on welfare of SC, ST, OBC and minorities (2024-25 actuals 24 per cent below budget)

No.	Source	Used for
S2	PRS Legislative Research, "Andhra Pradesh Budget Analysis 2026-27" (PDF, 11 March 2026). https://prsindia.org/files/budget/budget_state/andhra-pradesh/2026/Budget_Analysis_2026-27-AP.pdf	The allocations as quoted; Table 3 (pension Rs 23,713 crore, interest Rs 37,281 crore, 10 and 16 per cent of revenue receipts); Table 4 (welfare of SC, ST, OBC and minorities: Rs 36,160, 52,047, 41,705 and 52,855 crore); the Sixteenth Finance Commission on the highest per capita expenditure on social security pensions (Rs 5,061), on JAM reducing leakages, on targeting, and on the verification in one village or ward secretariat per district (9 per cent ineligible, 0.6 per cent dead); committed expenditure limiting the State's flexibility
S3	Government of Andhra Pradesh, NTR Bharosa Pension Scheme portal, "About Us" (seen 26 October 2026). https://sspensions.ap.gov.in/	Name of the scheme; G.O.Ms.No.43 dated 13.06.2024 enhancing the amounts; categories at Rs 4,000, Rs 6,000 and Rs 10,000 a month
S4	Government of Andhra Pradesh, Panchayat Raj and Rural Development (RD.I) Department, Memo No. 3407491/RD.I/A1/2026, dated 6 September 2026, "Process for New Pension Applications under NTR Bharosa Pension Scheme through Swarna Grama and Swarna Wardu". https://sspensions.ap.gov.in/SSP/Downloads/Memo%20No.%203407491_New%20pension%20sanction%20guidelines_Signed.pdf	Common eligibility under G.O.Ms.No.174 of 13.12.2019; Aadhaar and rice card or income certificate for all categories; category proofs (SADAREM certificate of 40 per cent benchmark disability and the others); the six checks by the MPDO or Municipal Commissioner; roles of the Digital Assistant, WEDPS, WEA, WWDS, secretariat staff, Tahsildar, district-level officers and the CEO of SERP; "The MPDO shall not give any sanctions"; verification at the State level by SGSW, RTGS and SERP "before giving the final sanction"; the sanction issued by SERP, subject to Government approval and budget; pension from the month of sanction, not retrospective; routing of single women through the Tahsildar and of the special categories to the State-level departments; eKYC

No.	Source	Used for
S5	Government of Andhra Pradesh, Planning Department, Socio-Economic Survey 2024-25, hosted by the Finance Department. https://s3.ap-south-1.amazonaws.com/apfinance.gov.in/uploads/index-docs/AP_Socio_Economic_Survey_2024_25.pdf	Deepam-2 launched in 2024, three free LPG cylinders a year to 83 lakh eligible families; Anna Canteens for affordable meals to the urban poor (198 working, six under construction, 158 planned in rural areas); Thalliki Vandanam as Rs 15,000 annually to mothers of school-going children; the Swarna Andhra KPI Dashboard, which "will provide real-time tracking of performance indicators"
S6	PRS Legislative Research, "Andhra Pradesh Budget Analysis 2025-26" (web page). https://prsindia.org/budgets/states/andhra-pradesh-budget-analysis-2025-26	Talliki Vandanam: financial assistance of Rs 15,000 annually for school-going children of classes 1 to 12, from 2025-26
S7	Government of Andhra Pradesh, Public Grievance Redressal System portal, "Centralized Public Grievance Redress And Monitoring System" (seen 26 October 2026). https://pgrs.ap.gov.in/	Name of the system; raising an issue directly with the Chief Minister's Office, for oneself or the household; status tracking; OTP to the Aadhaar-linked phone number; the IT, Electronics and Communications Department
S8	Government of Andhra Pradesh, Swarna Grama and Swarna Wardu portal (seen 26 October 2026). https://gramawardsachivalayam.ap.gov.in/	Swarna Grama and Swarna Wardu as local government facilities set up to decentralise administration; the portal's headings for staff, services and the Public Grievance Redressal System
S9	Constitution of India, Article 151, "Audit reports", text on Constitution of India (constitutionofindia.net). https://www.constitutionofindia.net/articles/article-151-audit-reports/	Clause (1): Union audit reports to the President and Parliament; clause (2): State audit reports to the Governor, laid before the Legislature of the State
S10	Government of Andhra Pradesh, West Godavari District portal, Civil Supplies page on Deepam-2 (seen 26 October 2026). https://westgodavari.ap.gov.in/?p=2792	Deepam-2 inaugurated on 01.11.2024; three LPG refills free of cost to LPG consumers holding rice cards

No.	Source	Used for
S11	Government of Andhra Pradesh, Finance Department, Budget Speech 2026-27 of Sri Payyavula Keshav, Minister for Finance, 14 February 2026 (English). https://apfinance.gov.in/...Bud@et26-27/documents/SpeechEnglish.pdf	Annadatha Sukhibhava-PM Kisan: Rs 20,000 released in 2025-26 to 46.86 lakh farmer families; Stree Shakti introduced from 15 August 2025
S12	Press Information Bureau, Government of India, "PM-KISAN: Empowering Annadatas by providing Accessible & Timely Financial Assistance" (June 2023). https://static.pib.gov.in/WriteReadData/specificdocs/documents/2023/jun/doc2023614212001.pdf	PM-KISAN as a Central Sector scheme; income support of Rs 6,000 a year in three equal instalments to land-holding farmer families

Topic 243 | Land reforms: abolition of intermediaries, tenancy and ceilings

1. Concept in one line

Land reform in independent India rested on three measures: removing the intermediaries who stood between the State and the cultivator, regulating tenancy, and fixing a ceiling on holdings so that surplus land could go to the landless. The examination asks about these three measures, the constitutional amendments that protected land laws, and examples such as Bhoodan, Operation Barga and Andhra Pradesh's ceiling Act of 1973.

2. Revision notes

2.1 Why land reform was needed

- **Zamindari:** a land revenue system in which the revenue was collected indirectly, through agreements made with zamindars. The East India Company, under Lord Cornwallis, made the Permanent Settlement with the zamindars in 1793 (Wikipedia). The zamindars stood between the State and the cultivators: they were intermediaries.
- **Ryotwari:** a system in which the land revenue was collected directly from each cultivator (ryot), with no intermediary. It was devised by Alexander Read and Thomas Munro at the end of the 18th century, and Munro introduced it as Governor of Madras (1820 to 1827).
- Recall Topic 101: the Mughals used the one term "zamindar" for all the intermediaries, and the revenue was usually collected through them.
- Recall Topic 55: the average operational holding was only 1.08 hectares in 2015-16, and NCERT lists the poor implementation of land reforms among the problems of Indian agriculture.

2.2 The three pillars of land reform

The First Five Year Plan's chapter on land policy dealt with all three of these measures.

Pillar	What it means	Instruments and examples
1. Abolition of intermediaries	Removing the rent collectors of the pre-Independence land revenue system, so that the cultivator deals directly with the State	State zamindari abolition Acts, such as the Uttar Pradesh Zamindari Abolition and Land Reforms Act, 1950; the First Amendment, 1951, protected them through Articles 31A and 31B

Pillar	What it means	Instruments and examples
2. Tenancy reform	Regulating tenancy to improve the terms of the contract, including security of tenure	The Plans' norm of a rent not above one-fourth or one-fifth of the produce; West Bengal's Operation Barga (1978): sharecroppers recorded, protected against eviction, given a fixed share of the crop
3. Ceiling on holdings	Fixing the most land that one holder may keep, and redistributing the surplus land to the landless	State ceiling Acts, such as Andhra Pradesh's Act of 1973; all-India, 50.94 lakh acres of surplus land distributed (Lok Sabha reply, 26 February 2015)

2.3 Abolition of intermediaries

- The First Plan (1951-56) recorded that zamindari had been abolished in Uttar Pradesh, Madhya Pradesh and Madras and was being abolished in Bihar. It expected compensation to take the form of non-negotiable bonds carrying interest.
- The State abolition laws were soon held up in the courts. When Parliament took up the First Amendment, it noted that the agrarian reform laws had become caught in dilatory litigation in spite of clauses (4) and (6) of Article 31.
- **The First Amendment (enacted on 18 June 1951)** answered this. It inserted Article 31A, which saved laws for the acquisition of estates, and Article 31B. Article 31B protects the Acts and Regulations listed in a new Ninth Schedule: none of them is void, "or ever to have become void", on the ground that it violates the Fundamental Rights.
- The first Ninth Schedule listed 13 land laws, most of them abolishing zamindaris, jagirs and other intermediary tenures. Among them were the Uttar Pradesh Zamindari Abolition and Land Reforms Act, 1950 and the Hyderabad (Abolition of Jagirs) Regulation.
- **Limit:** the Second Plan (1956) found that intermediaries had been almost entirely abolished, with a few pockets left, such as some estates in Assam and Rajasthan.

2.4 Constitutional amendments that protected land laws

Amendment	In force from	What it did for land reform
First, 1951	18 June 1951	Inserted Articles 31A and 31B and the Ninth Schedule, to secure the validity of the zamindari abolition laws
4th, 1955	27 April 1955	Amended Articles 31, 31A and 305 and the Ninth Schedule

Amendment	In force from	What it did for land reform
17th, 1964	20 June 1964	Widened the meaning of "estate" in Article 31A to include land held under ryotwari settlement; required compensation not less than the market value for land within the ceiling limit under personal cultivation; placed 44 more land laws in the Ninth Schedule
34th, 1974	7 September 1974	Amended no Article; it placed 20 more State land laws in the Ninth Schedule, among them revised ceiling Acts such as Andhra Pradesh's Act of 1973
44th, 1978	20 June 1979, for these changes	Omitted Article 31 and sub-clause (f) of Article 19(1); the right to property now stands in Article 300A, outside Part III (Topic 233)

- In *I.R. Coelho v. State of Tamil Nadu* (11 January 2007), a nine-judge Bench of the Supreme Court held that laws placed in the Ninth Schedule after 24 April 1973, the date of the *Kesavananda Bharati* judgment, do not have full protection: they can be reviewed against the basic structure of the Constitution.

2.5 Tenancy reform: Operation Barga

- Tenancy reform regulates a tenant's terms, above all security of tenure: no eviction at will.
- **Plan norms:** the First and Second Plans said that a rent above one-fourth or one-fifth of the produce needed special justification. The Second Plan asked the States to stay the ejectment of tenants except for non-payment of rent or misuse of land, and said that tenants of land the owner could not resume should become owners.
- **Operation Barga** was launched in 1978 by the West Bengal government, after the Left Front came to power in 1977. It recorded the names of the sharecroppers (bargadars) and informed them of their rights.
- A recorded bargadar got legal protection against eviction by the landlord, and his rights were made hereditary.
- **Crop share:** the bargadar was guaranteed 75 per cent of the crop if he provided the non-labour inputs, and 50 per cent if the landlord provided them.
- By September 2003, 15,14,457 bargadars had been recorded in West Bengal, 11,64,612 of them under Operation Barga (Dasgupta, University of California, Riverside).

2.6 Ceilings and surplus land

- A ceiling is the largest area of land that one holder (in Andhra Pradesh, a family unit) may keep. Land above the ceiling is declared surplus, taken over by the State and given to the landless.
- Each State has its own ceiling Act and limits; Andhra Pradesh's is in 2.8.
- **The Plans:** the First Plan thought "about three times the family holding" a fair limit for an individual holding. The Second Plan proposed a ceiling of about three family holdings.
- **The 1972 guidelines:** the Chief Ministers' Conference of 23 July 1972 recommended lower ceilings, a ceiling applied to the land held by a family, and the withdrawal of exemptions. The Government of India accepted these and issued guidelines to the States for revising their ceiling laws.
- **All-India progress, as reported by the States and Union Territories** (Ministry of Rural Development, reply in the Lok Sabha, 26 February 2015):

Stage	Area (lakh acres)
Declared surplus	68.45
Taken possession of	61.48
Distributed	50.94, to 57.25 lakh beneficiaries
Of the area distributed: to Scheduled Castes, Scheduled Tribes and others	19.04, 7.83 and 24.06

- 6.97 lakh acres were declared surplus but not taken over, and 10.54 lakh acres were taken over but not distributed. The area distributed was about 74 per cent of the area declared surplus.

2.7 Bhoodan and Gramdan

- **Bhoodan** ("land gift") was Vinoba Bhave's movement to persuade wealthy landowners to give a part of their land, of their own will, to the landless.
- It had its first success on 18 April 1951 at Pochampally village in Nalgonda district (now in Telangana), where V. Ramachandra Reddy offered 100 acres.
- **Gramdan** ("village in gift") was the gift of a whole village. In May 1952, in Uttar Pradesh, Vinoba received the whole village of Mangroth (also spelt Mangrath), usually named the first Gramdan village.
- By the 1975 figures, 41,94,270 acres had been received and 12,85,738 acres distributed; 18,57,398 acres were found unfit for distribution (a life sketch of Vinoba on mkgandhi.org).

2.8 Andhra Pradesh: the ceiling Act of 1973

- **Earlier laws:** the Hyderabad (Abolition of Jagirs) Regulation was in the first Ninth Schedule (1951). The 17th Amendment placed the Hyderabad Tenancy and Agricultural Lands Act, 1950 and the Andhra Pradesh Ceiling on Agricultural Holdings Act, 1961 in the Ninth Schedule.

- The A.P. Land Reforms (Ceiling on Agricultural Holdings) Act, 1973 (Act 1 of 1973) received the President's assent on 1 January 1973. It came into force on 1 January 1975. The 34th Amendment placed it in the Ninth Schedule (entry 67). In 2016 it was adapted for Telangana as the Telangana Land Reforms (Ceiling on Agricultural Holdings) Act, 1973.

Provision	What the Act says
Family unit	An individual, the spouse or spouses, their minor sons and their unmarried minor daughters
Ceiling for a family unit of up to five members	One standard holding
Ceiling for a family unit of more than five members	One standard holding, plus one-fifth of a standard holding for each member above five, but not more than two standard holdings
Ceiling for an individual who is not a member of a family unit	One standard holding
Major sons	Where major sons hold less than the ceiling, the ceiling of the family may be increased (section 4-A)

The standard holding is not one figure. It is set in section 5 for each class of land:

Class of land (section 5)	Standard holding
Double crop wet land, Classes A to F	10 acres to 18 acres
Other wet land, Classes A to F	15 acres (6.07 hectares) to 27 acres (10.93 hectares)
Dry land, Classes G to K	35 acres (14.16 hectares) to 54 acres (21.85 hectares)

- The better the land, the smaller the standard holding: the lowest figure is 10 acres (double crop wet land of Class A) and the highest is 54 acres (dry land of Class K). Provisos to section 5 raise some of these figures in particular cases.

Statutory scope —31 October2026: These provisions are taught from the supplied A.P. Act text as amended to2009, freshly read in the FAOLEX copy; this is not a certification of the law's complete amendment status in2026. Section4(2)'s two-standard-holding cap is the ordinary family-size rule. Section4-A starts notwithstanding section4 and permits an additional ceiling in specified cases involving major sons. Do not turn section4(2) into an absolute cap that erases section4-A. Major sons are not included in the section3(f) family-unit definition merely because section4-A provides a separate adjustment.

2.9 Assessment

Point	Success or failure	Whose view
Zamindari abolition	Success: intermediaries almost entirely abolished, though a few pockets were left	Second Five Year Plan

Point	Success or failure	Whose view
Operation Barga	Success: registration and security of tenancy improved, and the social status of bargadars rose	A study of 1986-88, as cited by Wikipedia
Operation Barga	Failure: it did not raise production on barga land in the three districts studied	The same study, as cited by Wikipedia
Ceilings	Partial: 50.94 of the 68.45 lakh acres declared surplus had been distributed (reply of 26 February 2015)	Ministry of Rural Development
Ceilings	Failure: owners often found loopholes in the ceiling laws, so land reform succeeded only in pockets of the country	Wikipedia
Bhoodan	Limited: 12,85,738 of 41,94,270 acres received had been distributed by 1975	A life sketch of Vinoba on mkgandhi.org

3. Extra section: a chronology of land reform

Year	Event
1793	Permanent Settlement with the zamindars, under Lord Cornwallis
1820	Thomas Munro, with whom the ryotwari system is associated, becomes Governor of Madras (to 1827)
1951	18 April: first success of Bhoodan at Pochampally. 18 June: First Amendment enacted (Articles 31A and 31B, Ninth Schedule)
1955	4th Amendment, in force from 27 April
1964	17th Amendment, in force from 20 June
1972	23 July: Chief Ministers' Conference on revising the ceiling laws
1973	1 January: President's assent to the A.P. ceiling Act. 24 April: Kesavananda Bharati judgment
1974	34th Amendment, in force from 7 September
1978	Operation Barga launched in West Bengal
1979	44th Amendment: Article 31 and Article 19(1)(f) omitted, from 20 June
2007	11 January: I.R. Coelho judgment (Ninth Schedule laws placed after 24 April 1973 can be reviewed)

Year	Event
2015	26 February: Lok Sabha told that 68.45 lakh acres had been declared surplus and 50.94 lakh acres distributed
2016	The A.P. ceiling Act adapted for Telangana

4. Three common exam traps

1. **Mixing up the zamindari and ryotwari systems.** Under zamindari the revenue was collected through the zamindars, who were intermediaries; the Permanent Settlement with them was made in 1793. Under ryotwari the revenue was fixed directly on the ryot, the cultivator; it is linked with Thomas Munro in Madras. Only the zamindari system had the intermediaries whom the abolition Acts removed.
2. **Taking one ceiling figure for another.** "Declared surplus" (68.45 lakh acres), "taken possession of" (61.48 lakh acres) and "distributed" (50.94 lakh acres) are three stages, in the Lok Sabha reply of 26 February 2015. A question may quote any of them; 57.25 lakh is the number of beneficiaries, not an area.
3. **Treating the standard holding as a single figure.** In Andhra Pradesh it is a range that depends on the class of land: 10 to 18 acres for double crop wet land, 15 to 27 acres for other wet land, and 35 to 54 acres for dry land. Poorer land gets a larger standard holding, not a smaller one.

7. Sources

7.1 Sources

No.	Source	Used for
S1	The Telangana Land Reforms (Ceiling on Agricultural Holdings) Act, 1973 (Act No. 1 of 1973), the A.P. Act as adapted by the Telangana Adaptation of Laws Order, 2016, India Code. https://www.indiacode.nic.in/bitstream/123456789/8693/1/act_1_of_1973.pdf	President's assent to the A.P. Act on 1 January 1973; adaptation for Telangana in 2016; section 3(f), family unit; section 3(s), standard holding; section 4, ceiling area (one standard holding up to five members, one-fifth more for each member above five, not more than two standard holdings; one standard holding for an individual); section 4-A, major sons; section 5, the Table of standard holdings for double crop wet land, other wet land and dry land, in acres and hectares, and its provisos

No.	Source	Used for
S2	Lok Sabha, Starred Question No. 45 on land reform programmes, answered by the Ministry of Rural Development (Minister Birender Singh) on 26 February 2015. https://eparlib.nic.in/bitstream/123456789/657599/1/12334.pdf	Ceiling surplus land as reported by the States and Union Territories: 68.45 lakh acres declared surplus, 61.48 lakh acres taken possession of, 50.94 lakh acres distributed to 57.25 lakh beneficiaries; 19.04, 7.83 and 24.06 lakh acres distributed to Scheduled Castes, Scheduled Tribes and others
S3	Wikipedia, "Land reform in India" (citing Heller, 1999; The Times of India, 2011). https://en.wikipedia.org/wiki/Land_reform_in_India	Kerala's reforms; loopholes in the ceiling laws and success only in pockets
S4	Wikipedia, "Bhoodan movement". https://en.wikipedia.org/wiki/Bhoodan_movement	"Land gift" and the aim of the movement; Pochampally in Nalgonda district; Gramdan as "village in gift"; Mangroth as the first Gramdan village
S5	Wikipedia, "Operation Barga" (citing Hanstad and Nielsen, Rural Development Institute; a 1986-88 study; the National Sample Survey, 1999; a 2003 survey). https://en.wikipedia.org/wiki/Operation_Barga	Bargadars informed of their rights; protection against eviction; hereditary rights; findings on tenure, status and production; 30.6 per cent registered in 1999; 14.37 per cent dispossessed in 2003
S6	Wikipedia, "Ryotwari" (citing Dutt, 1902). https://en.wikipedia.org/wiki/Ryotwari	Zamindari as revenue collected through agreements with zamindars
S7	Wikipedia, "Zamindar". https://en.wikipedia.org/wiki/Zamindar	Permanent Settlement with the zamindars in 1793 under Lord Cornwallis
S8	The Constitution (First Amendment) Act, 1951, with its Statement of Objects and Reasons, National Portal of India. https://www.india.gov.in/my-government/constitution-india/amendments/constitution-india-first-amendment-act-1951	Enacted 18 June 1951; agrarian reform laws caught in "dilatory" litigation in spite of clauses (4) and (6) of Article 31; validity of zamindari abolition laws; section 4 inserting Article 31A on laws for the acquisition of estates; section 5 inserting Article 31B; section 14, the Ninth Schedule of 13 Acts and Regulations, including the Uttar Pradesh Zamindari Abolition and Land Reforms Act, 1950, the Bombay Tenancy and Agricultural Lands Act, 1948 and the Hyderabad (Abolition of Jagirs) Regulation

No.	Source	Used for
S9	The Constitution (Fourth Amendment) Act, 1955, National Portal of India. https://www.india.gov.in/my-government/constitution-india/amendments/constitution-india-fourth-amendment-act-1955	Dated 27 April 1955; amendment of Articles 31, 31A and 305 and the Ninth Schedule
S10	The Constitution (Seventeenth Amendment) Act, 1964, text with Statement of Objects and Reasons (mirror at constitution.org). https://www.constitution.org/1-Constitution/cons/india/tamnd17.htm	Assent on 20 June 1964; "estate" in Article 31A widened to include land held under ryotwari settlement; proviso on compensation not less than market value for land within the ceiling limit under personal cultivation; 44 entries (21 to 64) added to the Ninth Schedule, including the Andhra Pradesh Ceiling on Agricultural Holdings Act, 1961 and the Hyderabad Tenancy and Agricultural Lands Act, 1950
S11	The Constitution (Thirty-fourth Amendment) Act, 1974, with its Statement of Objects and Reasons, National Portal of India. https://www.india.gov.in/my-government/constitution-india/amendments/constitution-india-thirty-fourth-amendment-act-1974	Enacted 7 September 1974; only operative section amends the Ninth Schedule, inserting entries 67 to 86, all State laws; entry 67, the Andhra Pradesh Land Reforms (Ceiling on Agricultural Holdings) Act, 1973; Chief Ministers' Conference of 23 July 1972 on lower ceilings, ceiling on the land held by a family and withdrawal of exemptions; guidelines issued to the States
S12	The Constitution (Forty-fourth Amendment) Act, 1978, text (mirror at constitution.org). https://www.constitution.org/1-Constitution/cons/india/tamnd44.htm	Section 2, sub-clause (f) of Article 19(1) omitted; section 6, Article 31 omitted; section 34, Article 300A inserted

No.	Source	Used for
S13	Government of India, Ministry of Law and Justice, Legislative Department, *The Constitution of India* [As on 1st May, 2024], official text with footnotes. https://cdnbbsr.s3waas.gov.in/s380537a945c7aaa788ccfcdf1b99b5d8f/uploads/2024/07/20240716890312078.pdf	Article 31 omitted by the Forty-fourth Amendment, s. 6 (w.e.f. 20-6-1979); Article 31A inserted by the First Amendment, s. 4 (with retrospective effect); Article 31A(2)(a)(ii), "any land held under ryotwari settlement", substituted by the Seventeenth Amendment (with retrospective effect); Seventeenth Amendment proviso w.e.f. 20-6-1964; text of Article 31B, "or ever to have become void"
S14	Supreme Court of India, *I.R. Coelho (Dead) by LRs v. State of Tamil Nadu*, judgment of 11 January 2007 (nine judges). https://api.sci.gov.in/judgment/judis/28469.pdf	Ninth Schedule laws placed after 24 April 1973, the date of the Kesavananda Bharati judgment, do not have full protection and can be reviewed against the basic structure
S15	Planning Commission, *First Five Year Plan*, chapter 12, "Land Policy" (archive on the NITI Aayog site). https://niti.gov.in/planningcommission.gov.in/docs/plans/planrel/fiveyr/1st/1planch12.html	Zamindari abolished in Uttar Pradesh, Madhya Pradesh and Madras and being abolished in Bihar; compensation in non-negotiable bonds carrying interest; rent above one-fourth or one-fifth of the produce needing special justification; "about three times the family holding" as a fair limit for an individual holding
S16	Planning Commission, *Second Five Year Plan*, chapter 9 (archive on the NITI Aayog site). https://niti.gov.in/planningcommission.gov.in/docs/plans/planrel/fiveyr/2nd/2planch9.html	Intermediaries almost entirely abolished, with pockets left in Assam and Rajasthan; rent above one-fourth or one-fifth of the produce needing special justification; ejectment stayed except for non-payment of rent or misuse of land; tenants of non-resumable land to become owners; ceiling of about three family holdings
S17	The Andhra Pradesh Land Reforms (Ceiling on Agricultural Holdings) Act, 1973 (Act No. 1 of 1973), as amended to 2009, FAOLEX. https://faolex.fao.org/docs/pdf/ind193916.pdf	The A.P. text of section 1(3) (commencement on a date notified by the Government), section 3(f), section 4, section 4-A and the section 5 Table, matching the Telangana adaptation

No.	Source	Used for
S18	Encyclopaedia Britannica, "Ryotwari system". https://www.britannica.com/topic/ryotwari-system	Revenue collected directly from each cultivator; devised by Alexander Read and Thomas Munro at the end of the 18th century; introduced by Munro as Governor of Madras (1820 to 1827); intermediaries eliminated
S19	Subhash Mehta, "Bhoodan", mkgandhi.org. https://www.mkgandhi.org/vinoba/bhoodan.htm	Bhoodan began on 18 April 1951 at Pochampalli, Nalgonda district; Ram Chandra Reddy's promise of 100 acres
S20	"Vinoba Bhave: A Life Sketch", mkgandhi.org. https://www.mkgandhi.org/vinoba/bio.htm	Pochampalli meeting of 18 April 1951; the whole village of Mangrath received in Uttar Pradesh in May 1952; by the 1975 figures, about 41,94,270 acres received, 12,85,738 acres distributed and 18,57,398 acres unfit for distribution
S21	Anirban Dasgupta, "Agrarian Reforms in West Bengal since 1977: A Closer Look at Actual Facts", Department of Economics, University of California, Riverside. https://webarchive.ucr.edu/economics.ucr.edu/wp-content/uploads/2019/11/ped03092005.pdf	Operation Barga from September 1978, after the Left Front came to power in 1977; registration of bargadars for security of tenure; crop share of 75 per cent, or 50 per cent when the landlord gave the non-labour inputs; 15,14,457 bargadars recorded by September 2003, 11,64,612 of them under Operation Barga
S22	Supreme Court of India, *Agnigundala Venkata Ranga Rao v. Indukuru Ramachandra Reddy (Dead) by LRs. & Ors.*, Civil Appeal No. 5817 of 2012, judgment of 13 April 2017. https://api.sci.gov.in/jonew/judis/44771.pdf	The A.P. Land Reforms (Ceiling on Agricultural Holdings) Act, 1973 came into force on 1 January 1975 (para 5)

Topic 244 | Literacy in India: levels and regional differences

1. Concept in one line

Literacy in the Census of India is measured for persons aged seven and above, and the 2011 Census showed wide gaps between States, between men and women and between rural and urban areas. The examination asks for the 2011 rates and the change since 2001, the States at the two ends, the gaps, the later survey estimates, Andhra Pradesh's position and the literacy programmes.

2. Revision notes

2.1 Where this topic sits

- **Topic 145** gave India's population in 2011 and noted the effective literacy rate: 74.04 per cent in MoSPI's write-up, which uses the provisional totals, and 73.0 per cent in the final Census table.
- **Topic 215** gave the sex ratio (943 final; 940 provisional) and warned against mixing provisional and final 2011 figures.
- **Topic 235** treated the Census as a data source: its reference date (00:00 hours of 1 March 2011), its definitions and the boundaries of 2011, including the undivided Andhra Pradesh.

2.2 Who is literate, and two ways of measuring it

- **Literate (Census 2011):** "a person aged seven and above, who can both read and write with understanding in any language, is treated as literate." A person who can only read but cannot write is not literate.
- **Effective literacy rate:** literates aged seven and above as a percentage of the population aged seven and above. This is the rate the Census quotes for 2011.
- **Crude literacy rate:** literates as a percentage of the total population of the area, including children below seven years of age.
- Because the crude rate puts children aged 0 to 6 in the denominator, it is lower when there are literates and children aged 0 to 6. More generally, it cannot exceed the effective rate.

2.3 India in the 2011 Census

The Census first released provisional figures and later its final tables, as in Topics 145 and 215. Both are in use.

Item	2011, provisional (MoSPI, PIB)	2011, final (Census table in the *National Health Profile* 2018)	Change from 2001 (provisional basis)
Persons	74.04 per cent	73.0 per cent	Up 9.21 percentage points, from 64.83 per cent in 2001
Males	82.14 per cent	80.9 per cent	Up 6.88 points
Females	65.46 per cent	64.6 per cent	Up 11.79 points
Rural persons	Not given in these sources	67.8 per cent	Not given in these sources
Urban persons	Not given in these sources	84.1 per cent	Not given in these sources

- **Numbers (provisional):** 778,454,120 literates and 272,950,015 illiterates aged seven and above. Illiterates fell from 304,146,862 in 2001. In 2001 to 2011, 217,700,941 more persons became literate, and females (110,069,001) outnumbered males (107,631,940) among them.
- In MoSPI's words, "three-fourth of the population of aged 7 years and above is literate", and "Four out of every five males and two out of every three females in the country are literate."
- MoSPI also notes that the target of 85 per cent set by the Planning Commission had not been reached.

2.4 The gender gap and the rural-urban gap

Gap (2011)	Figures	Gap
Male against female, provisional	82.14 and 65.46 per cent	16.68 percentage points
Male against female, final	80.9 and 64.6 per cent	16.3 points
Urban against rural, final	84.1 and 67.8 per cent	16.3 points
Urban males against rural females, final	88.8 and 57.9 per cent	30.9 points

- The gender gap narrowed in 2001 to 2011: female literacy rose by 11.79 points and male literacy by 6.88 points, so the gap fell by 4.91 points.
- Final figures by sex and area: rural females 57.9, urban males 88.8, urban females 79.1 per cent.
- Gender and residence disadvantages intersect; these gaps must not simply be added arithmetically. Rural women had the lowest rate among the four sex-by-residence groups. MoSPI notes that female literacy still has to improve to become comparable with male literacy.
- **Scheduled Castes and Scheduled Tribes (Census 2011):** literacy among persons aged seven and above was 66.07 per cent for Scheduled Castes and 58.95 per cent for Scheduled Tribes (Ministry of Human Resource Development, Lok Sabha reply of 12 August 2015). The Ministry of Tribal Affairs gives the Scheduled Tribe rate as 59.0 per cent, with males 68.5 and females 49.4.

2.5 States and Union territories in 2011

Final figures (Census table in the *National Health Profile* 2018), with the provisional figures (*India* 2020 reference annual) where they are given:

Position	State or Union territory	Final (per cent)	Provisional (per cent)
Highest	Kerala	94.0	93.91
Second	Lakshadweep (Union territory)	91.8	92.28
Third	Mizoram	91.3	91.58
Lowest among States	Bihar	61.8	63.82
Second lowest among States	Arunachal Pradesh	65.4	66.95
Third lowest among States	Rajasthan	66.1	67.06

- Jharkhand (66.4, final) came next above Rajasthan.
- **Female literacy (final):** highest in Kerala (92.1) and Mizoram (89.3); lowest in Bihar (51.5) and Rajasthan (52.1).
- **Gender gap inside States (final):** Kerala, males 96.1 and females 92.1, a gap of 4.0 points; Rajasthan, males 79.2 and females 52.1, a gap of 27.1 points.
- **The regional pattern in the figures:** high literacy in Kerala, in Mizoram and Tripura (87.2) of the north-east, in Goa (88.7) and in Himachal Pradesh (82.8); low literacy in Bihar, Rajasthan, Jharkhand and Uttar Pradesh (67.7). Neither region is uniform: in the north-east, Arunachal Pradesh was second lowest of all States; in the south, Tamil Nadu (80.1) and Karnataka (75.4) were above the national 73.0, while undivided Andhra Pradesh (67.0) was below it.
- Among the Union territories, Delhi had 86.2, Puducherry 85.8, the Andaman and Nicobar Islands 86.6 and Dadra and Nagar Haveli 76.2 (final).

2.6 Later estimates: surveys, not a census

Item	NSS 75th round	Periodic Labour Force Survey (PLFS)
Conducted by	National Statistical Office (NSO), MoSPI	NSO, MoSPI
Nature	Sample survey, “Household Social Consumption on Education in India” (NSS Report No. 585)	Sample survey of the labour force; literacy is one of its tables
Period	July 2017 to June 2018	July 2023 to June 2024 (annual report of 23 September 2024)

Item	NSS 75th round	Periodic Labour Force Survey (PLFS)
Age group	Seven years and above	Seven years and above
India, persons	77.7 per cent	80.9 per cent
Males and females	84.7 and 70.3 per cent	87.2 and 74.6 per cent
Rural and urban	73.5 and 87.7 per cent	77.5 and 88.9 per cent

- **NSS 2017-18, the States:** highest Kerala (96.2), then Delhi (88.7), Uttarakhand (87.6), Himachal Pradesh (86.6) and Assam (85.9). Lowest Andhra Pradesh (66.4), then Rajasthan (69.7), Bihar (70.9), Telangana (72.8), Uttar Pradesh (73.0) and Madhya Pradesh (73.7).
- The Ministry of Education quoted the rise in literacy as "from 74 percent in 2011 to 80.9 percent in 2023-24" (8 September 2025).
- A survey estimates the rate from a sample of households; the Census counts every person. Keep the 2011 Census figures and the survey figures in separate columns, and do not read the difference between them as an exact decade's change.

2.7 Andhra Pradesh

Item	Figure	Base and source
Undivided State, 2011 (final)	67.0 per cent; males 74.9, females 59.1; rural 60.4, urban 80.1	Census table in the *National Health Profile* 2018
Present State, 2011	67.35 per cent (62.07 in 2001)	AP Socio-Economic Survey 2024-25
Present State, female literacy	59.96 per cent in 2011 (52.72 in 2001)	AP Socio-Economic Survey 2024-25
Present State, NSS 2017-18	66.4 per cent; males 73.4, females 59.5; lowest among the States	NSO, as reported by PTI

- The AP Socio-Economic Survey 2024-25 states that the State's 2011 rate (67.35 per cent) was below the 2011 national rate of 72.98 per cent. The 2018-19 Survey records 29.94 per cent in 1981.
- So two 2011 figures exist for "Andhra Pradesh": 67.0 for the undivided State and 67.35 for the present State. Both are below the national rate.
- AP's social indicators, with district figures, are taught in Topic 595.

2.8 Literacy programmes

- **National Literacy Mission (1988):** set up as an autonomous wing of the Ministry of Human Resource Development, for adult literacy.
- **Saakshar Bharat (2009):** launched on 8 September 2009 by Prime Minister Manmohan Singh. It recast the National Literacy Mission to focus on the literacy of women, for non-literate persons aged 15 and above.

- **ULLAS: Nav Bharat Saaksharta Karyakram (New India Literacy Programme), 2022 to 2027:** a centrally sponsored scheme for adults aged 15 years and above who could not go to school. By 8 September 2025 it had enrolled over 3 crore learners and 42 lakh volunteers, with learning material in 26 Indian languages.

Current update: dated 29 September 2026

PIB's *Literacy for All* factsheet reports PLFS 2025 literacy at **81.1% overall**, **77.4% rural** and **89% urban** for age 7+. This is a later survey estimate, not a new Census count. Keep it separate from PLFS 2023-24 (80.9%) and Census 2011. The linked PLFS 2025 report could not be retrieved during this check; these new values are explicitly attributed to the PIB factsheet.

The same dated factsheet reports ULLAS with **about 4.03 crore registered learners**, **over 52.20 lakh volunteers**, materials in **27 languages**, and **more than 3.3 crore FLNAT participants**. Registration and test participation do not by themselves mean certification. The older September 2025 counts above are historical snapshots, not current totals.

As of this factsheet, **10 States/UTs** had declared full literacy: Ladakh, Mizoram, Goa, Tripura, Himachal Pradesh, Chandigarh, Andaman & Nicobar Islands, Sikkim, Uttarakhand and Jammu & Kashmir. This is a **29 September 2026 snapshot**, not an undated claim about the latest number. Full literacy under the programme uses its prescribed benchmark, not a claim of 100% Census literacy.

Source: PIB, 29 September 2026, https://www.pib.gov.in/FactsheetDetails.aspx?Id=151049&lang=2&reg=48 .

3. Extra section: "fully literate" declarations under ULLAS, and working out the rates

Declarations under ULLAS (benchmark: 95 per cent literacy among persons aged 15 years and above)

Date	Declaration
24 June 2024	Ladakh, the first Union territory declared fully literate
Before 23 June 2025	Mizoram and Goa, the first two States to achieve full functional literacy
23 June 2025	Tripura, the third State (literacy 95.6 per cent, against 20.24 per cent in 1961)
By 8 September 2025	Himachal Pradesh, named by the Ministry of Education as the fourth State

- "Fully literate" here is a programme benchmark (95 per cent of persons aged 15 and above). It is not the Census rate, which is for persons aged seven and above, and it does not mean 100 per cent.

- More States may have been declared after the dates in this table; the order above is the one the Ministry of Education gave.

Working out the two rates (illustrative town)

Step	Figure
Total population	1,00,000
Children aged 0 to 6	12,000
Population aged seven and above	88,000
Literates	66,000
Effective literacy rate	66,000 ÷ 88,000 × 100 = 75.0 per cent
Crude literacy rate	66,000 ÷ 1,00,000 × 100 = 66.0 per cent

- With India's provisional 2011 counts: 778,454,120 literates ÷ 1,051,404,135 persons aged seven and above gives 74.04 per cent (effective). Dividing the same literates by the whole provisional population of 1,210,193,422 gives about 64.3 per cent (crude).
- A gap is a difference of two rates, in percentage points: final 2011 male 80.9 minus female 64.6 gives 16.3 points.

4. Three common exam traps

1. **Provisional against final 2011 figures.** Many books still print 74.04 per cent (males 82.14, females 65.46), the provisional figures. The final Census table gives 73.0 per cent (males 80.9, females 64.6). Check which set a question uses before comparing.
2. **Two different "Andhra Pradesh" figures for 2011.** 67.0 per cent (final) is for the undivided State of the 2011 Census; 67.35 per cent is the State Government's figure for the present State. Neither can stand for the other.
3. **A survey is not a census.** The NSS and the PLFS are sample surveys taken years after 2011. Their rates cannot be set beside a Census rate as if both came from one complete count.

7. Sources

7.1 Sources

No.	Source	Used for
S1	Ministry of Statistics and Programme Implementation (MoSPI), *Statistical Year Book India*, chapter "Area and Population", write-up (based on the Census 2011 provisional totals). https://www.mospi.gov.in/sites/default/files/Statistical_year_book_india_chapters/Area%20And%20Population-writeup.pdf	Effective literacy rate 74.04 per cent, males 82.14, females 65.46; rise of 9.21 points; rises of 6.88 (males) and 11.79 (females) points; 778,454,120 literates and 272,950,015 illiterates aged seven and above; illiterates 304,146,862 in 2001; 217,700,941 new literates, females 110,069,001 and males 107,631,940; the "three-fourth" and "four out of every five males" quotations; Planning Commission target of 85 per cent; need to improve female literacy
S2	Press Information Bureau (Ministry of Home Affairs), "Country's Population Reaches 1210 Million as Per Census 2011", 31 March 2011. https://www.pib.gov.in/newsite/PrintRelease.aspx?relid=71383&reg=48&lang=2	Literacy up from 64.83 per cent in 2001 to 74.04 per cent in 2011; literates 74 per cent of the population aged seven and above
S3	Know India (National Portal of India), "Literacy" (from *India* 2020: *A Reference Annual*). https://knowindia.india.gov.in/profile/literacy.php	Census definition of a literate person (quotation); reading alone not enough; provisional 2011 rates of Kerala 93.91, Lakshadweep 92.28, Mizoram 91.58, Bihar 63.82, Arunachal Pradesh 66.95, Rajasthan 67.06
S4	Central Bureau of Health Intelligence, Ministry of Health and Family Welfare, *National Health Profile* 2018, Table 2.1.1, "State / UT wise Literacy Rate in India as per Census, 2011" (source: Census of India, 2011). https://cbhidghs.mohfw.gov.in/Ebook/National%20Health%20Profile-2018%20(e-Book)/files/assets/basic-html/page-74.html	Final 2011 rates for India (73.0; males 80.9; females 64.6; rural 67.8; urban 84.1; rural and urban by sex) and for the States and Union territories named in 2.5 and 2.7, including undivided Andhra Pradesh (67.0; males 74.9; females 59.1; rural 60.4; urban 80.1)

No.	Source	Used for
S5	Wikipedia, “Literacy in India” (citing the Census of India for the crude literacy rate). https://en.wikipedia.org/wiki/Literacy_in_India	Crude literacy rate as literates over the total population including those below seven; effective rate over the population aged seven and above; National Literacy Mission launched in 1988
S6	PTI, “At 96.2%, Kerala tops India’s literacy rate chart again, Andhra ranks last at 66.4%”, ThePrint, 7 September 2020 (reporting the NSO report “Household Social Consumption: Education in India”, NSS 75th round). https://theprint.in/india/at-96-2-kerala-tops-indias-literacy-rate-chart-again-andhra-ranks-last-at-66-4/497749/	NSS 75th round, July 2017 to June 2018, age seven and above: India 77.7, rural 73.5, urban 87.7, males 84.7, females 70.3; Kerala 96.2, Delhi 88.7, Uttarakhand 87.6, Himachal Pradesh 86.6, Assam 85.9; Andhra Pradesh 66.4 (males 73.4, females 59.5), Rajasthan 69.7, Bihar 70.9, Telangana 72.8, Uttar Pradesh 73.0, Madhya Pradesh 73.7
S7	Wikipedia, “List of Indian states and union territories by literacy rate” (citing NSO, MoSPI, *Annual Report*, *Periodic Labour Force Survey* (*July* 2023 *to June* 2024), 23 September 2024, pp. A-10 and A-332, https://www.mospi.gov.in/sites/default/files/publication_reports/AnnualReport_PLFS2023-24L2.pdf). https://en.wikipedia.org/wiki/List_of_Indian_states_and_union_territories_by_literacy_rate	PLFS 2023-24, age seven and above: India 80.9, males 87.2, females 74.6, rural 77.5, urban 88.9; NSS 75th round male and female figures (84.7 and 70.3) as a second check
S8	Press Information Bureau (Ministry of Education), “Ministry of Education celebrates International Literacy Day (ILD) 2025”, 8 September 2025 (copy on the Department of School Education and Literacy site). https://dsel.education.gov.in/sites/default/files/update/PIB2164749.pdf	Ladakh the first Union territory declared fully literate, 24 June 2024; Himachal Pradesh as the fourth State; over 3 crore learners, 42 lakh volunteers, 26 languages; “from 74 percent in 2011 to 80.9 percent in 2023-24” (quotation)

No.	Source	Used for
S9	Press Information Bureau (Ministry of Education), "Tripura becomes third state in the country, after Mizoram and Goa, to achieve Full Functional Literacy", 23 June 2025 (copy on the Department of School Education and Literacy site). https://dsel.education.gov.in/sites/default/files/update/PIB2139103.pdf	ULLAS full name; centrally sponsored scheme, 2022 to 2027; target group of adults aged 15 years and above who could not go to school; benchmark of 95 per cent among persons aged 15 and above (quotation); Tripura third after Mizoram and Goa; Tripura 95.6 per cent against 20.24 per cent in 1961
S10	National Statistical Office, MoSPI, *Key Indicators of Household Social Consumption on Education in India*, NSS KI (75/25.2), NSS 75th round (July 2017 to June 2018), Statement 2 (copy on MoSPI's microdata portal). https://microdata.gov.in/nada43/index.php/catalog/151/download/1937	Literacy rate of persons aged seven and above: rural 73.5 (males 81.5, females 65.0), urban 87.7 (males 92.2, females 82.8), all 77.7 (males 84.7, females 70.3)
S11	Planning Department, Government of Andhra Pradesh, *Socio-Economic Survey* 2018-19, Chapter 1, "General Review" (literacy paragraph). https://apfinance.gov.in/uploads/index-docs/SocioEconomicalSurvey2018-19.pdf	29.94 per cent in 1981; the 2011 and 2001 figures (67.35, 62.07; female 59.96, 52.72) and all-India 72.98, as repeated in S13
S12	Wikipedia, "Saakshar Bharat" (citing *The Hindu*, 2009, on the launch). https://en.wikipedia.org/wiki/Saakshar_Bharat	Launch on 8 September 2009 by Prime Minister Manmohan Singh; recast of the National Literacy Mission to focus on women's literacy; non-literate persons aged 15 and above; National Literacy Mission of 1988 as an autonomous wing of the Ministry of Human Resource Development
S13	Planning Department, Government of Andhra Pradesh, *Socio-Economic Survey* 2024-25, Section 1.1 (latest Survey listed on the Finance Department site, apfinance.gov.in/socio.html, as on 26 October 2026). https://s3.ap-south-1.amazonaws.com/apfinance.gov.in/uploads/index-docs/AP_Socio_Economic_Survey_2024_25.pdf	Literacy of the State 62.07 per cent (2001) and 67.35 per cent (2011), below the national 72.98; female literacy 52.72 and 59.96
S14	Ministry of Human Resource Development, Lok Sabha Unstarred Question No. 3841, answered on 12 August 2015 (Digital Parliament Library). https://eparlib.nic.in/bitstream/123456789/669052/1/23022.pdf	Census 2011 literacy, age seven and above: Scheduled Castes 66.07 per cent, Scheduled Tribes 58.95 per cent

No.	Source	Used for
S15	Ministry of Tribal Affairs, *Statistical Profile of Scheduled Tribes in India* 2013, Tables 2 and 3 (source: Office of the Registrar General, India). https://tribal.nic.in/ST/Statistics8518.pdf	Census 2011 literacy: all persons 73.0 (males 80.9, females 64.6); Scheduled Tribes 59.0 (males 68.5, females 49.4)
S16	National Statistical Office, MoSPI, NSS Report No. 585, *Household Social Consumption on Education in India*, summary (NSS 75th round, 1 July 2017 to 30 June 2018). https://mospi.gov.in/sites/default/files/announcements/Summary%20Analysis_Report_585_Education.pdf	Report number and title; survey period; literacy of persons aged seven and above about 77.7 per cent (rural 73.5, urban 87.7; males 84.7, females 70.3)

Topic 245 | Himalayan rivers: Indus, Ganga and Brahmaputra systems

1. Concept in one line

The Himalayan drainage is made up of three river systems, the Indus, the Ganga and the Brahmaputra, whose rivers are fed by melting snow as well as rain and are mostly perennial. The examination asks for their sources, tributaries, confluences and lengths, and for the Indus Waters Treaty.

2. Revision notes

2.1 Recall, and the two groups of Indian rivers

- **Recall (Topic 16):** drainage patterns and regimes; the Satluj, the Kosi and the Subansiri are antecedent rivers, and Ambala lies on the water divide between the Indus and the Ganga systems.
- **Recall (Topic 45):** the Godavari, the Krishna, the Penna and the Vamsadhara are Peninsular rivers of Andhra Pradesh.
- **Recall (Topic 136):** the Northern Plains, one of India's physical divisions, are built by these three river systems.
- **Recall (Topic 194):** the Himadri, Himachal and Shiwalik ranges, and the passes such as Shipki La, near which the Satluj enters India.

NCERT Class XI (Table 3.1, 2020-21 reprint) compares the two groups:

Point (NCERT Table 3.1)	Himalayan rivers	Peninsular rivers
Place of origin	Himalayan mountains covered with glaciers	Peninsular plateau and central highland
Nature of flow	Perennial; water from glaciers and rainfall	Seasonal; dependent on monsoon rainfall
Type of drainage	Antecedent and consequent, leading to a dendritic pattern in the plains	Superimposed and rejuvenated, resulting in trellis, radial and rectangular patterns
Nature of river	Long course through rugged mountains, with headward erosion and river capturing	Smaller, fixed course with well-adjusted valleys
Catchment area	Very large basins	Relatively smaller basins

Point (NCERT Table 3.1)	Himalayan rivers	Peninsular rivers
Age of river	Young and youthful, active and deepening the valleys	Old rivers with a graded profile

- The Peninsular rivers are Topic 266.

2.2 The Himalayan drainage and how it evolved

- The Himalayan drainage consists of the Indus, the Ganga and the Brahmaputra basins. Fed by melting snow and by rain, its rivers are perennial (NCERT Class XI). Class IX says "most" Himalayan rivers are perennial.
- In the mountains these rivers cut deep gorges and V-shaped valleys, with rapids and waterfalls. In the plains they build flat valleys, ox-bow lakes, flood plains, braided channels and deltas near the mouth. They meander and often shift their courses; NCERT's example is the Kosi.
- **The Indo-Brahma (Shiwalik) river theory:** geologists believe that in the Miocene period, about 5 to 24 million years ago, one great river, the Shiwalik or Indo-Brahma, flowed along the whole length of the Himalayas, from Assam to Punjab and on to Sind, and discharged into the Gulf of Sind near lower Punjab. It was later split into three: the Indus and its five tributaries in the west, the Ganga and its Himalayan tributaries in the centre, and the Brahmaputra in Assam in the east. The uplift of the Potwar Plateau in the western Himalayas acted as the water divide between the Indus and Ganga systems. The Delhi Ridge is a separate feature: NCERT names it, with the Aravalis and the Sahyadris, as part of the divide between the rivers that flow to the Arabian Sea and those that flow to the Bay of Bengal. The downthrusting of the Malda gap turned the Ganga and the Brahmaputra towards the Bay of Bengal (NCERT Class XI).

2.3 The Indus system

- **Source:** near Bokhar Chu in the Tibetan region, at about 4,164 m, in the Kailash range (NCERT Class XI). Class IX says it rises in Tibet near Lake Mansarowar and enters India in Ladakh.
- **Length:** 2,880 km, of which 1,114 km is in India (NCERT Class XI). Class IX gives a total length of 2,900 km.
- **Basin:** 11,65,000 sq. km, of which 321,289 sq. km is in India (NCERT Class XI).
- **Course:** through Ladakh and Baltistan, entering Pakistan near Chilas, to the Arabian Sea.
- **Himalayan tributaries named by NCERT:** the Shyok, Gilgit, Zaskar, Hunza, Nubra, Shigar, Gasting and Dras. The Kabul joins it on the right bank near Attock.
- **The Panjnad:** the five rivers of Punjab (the Satluj, Beas, Ravi, Chenab and Jhelum) join the Indus as the Panjnad, a little above Mithankot.

River	Where it rises or is formed (NCERT Class XI)	Course and where it joins
Jhelum	A spring at Verinag, at the foot of the Pir Panjal	Flows through Srinagar and the Wular lake; joins the Chenab near Jhang in Pakistan
Chenab	Formed by two streams, the Chandra and the Bhaga, which join at Tandi near Keylong in Himachal Pradesh	Flows 1,180 km before entering Pakistan
Ravi	West of the Rohtang pass, in the Kullu hills of Himachal Pradesh	Joins the Chenab near Sarai Sidhu
Beas	Beas Kund near the Rohtang pass, at about 4,000 m	Meets the Satluj near Harike
Satluj	Raksas Tal (also written Rakas Tal) near Mansarovar in Tibet, at 4,555 m; called Langchen Khambab in Tibet	Passes through Shipki La; comes out of a gorge at Rupar; feeds the Bhakra Nangal canal system

2.4 The Indus Waters Treaty, 1960, and its abeyance

- India and Pakistan signed the Treaty on 19 September 1960. Under its Article XII, it entered into force on 12 January 1961, when the two countries exchanged ratifications, and then took effect retrospectively from 1 April 1960.
- **Eastern Rivers (the Ravi, the Beas and the Sutlej, with their tributaries):** their waters are allocated to India.
- **Western Rivers (the Indus, the Jhelum and the Chenab, with their tributaries):** India must let their waters flow to Pakistan, except for domestic use, non-consumptive use, agricultural use as specified, and generation of hydro-electric power as specified (Ministry of Jal Shakti).
- Each country has a Commissioner for Indus Waters; together they form the Permanent Indus Commission.
- Class IX says India can use only 20 per cent of the Indus system’s water under the Treaty; the Treaty itself divides rivers, not a percentage.
- **Abeyance (2025):** after the terrorist attack of 22 April 2025, the Cabinet Committee on Security decided on 23 April 2025 to keep the Treaty in abeyance with immediate effect, “until Pakistan credibly and irrevocably abjures its support for cross-border terrorism” (PIB, May 2025). The official Indian statement dated 31 August 2026, reproduced by the Embassy of India in Belgrade, reiterates that India’s decision to hold the Treaty in abeyance remains in force. This records India’s stated position on that date; it is not a claim of mutually agreed termination or a resolution of the legal dispute. https://eoibelgrade.gov.in/index.php/listview/NzE2

2.5 The Ganga system: the headwaters

- **Bhagirathi:** rises in the Gangotri glacier near Gaumukh, at 3,900 m, in Uttarkashi district of Uttarakhand.
- **Alaknanda:** rises in the Satopanth glacier above Badrinath.
- **Devprayag:** the Bhagirathi meets the Alaknanda here; from here the river is called the Ganga. At Haridwar the Ganga leaves the mountains for the plains (Class IX).
- **Length:** 2,525 km (NCERT Class XI); Class IX says "over 2500 km". By State: Uttarakhand 110 km, Uttar Pradesh 1,450 km, Bihar 445 km, West Bengal 520 km.
- **Basin:** about 8.6 lakh sq. km in India (NCERT Class XI).

Prayag (downstream order)	River that joins the Alaknanda	Source
Vishnuprayag (at Joshimath)	NCERT: the Dhauli and the Vishnu Ganga meet here to form the Alaknanda	NCERT Class XI; other accounts call it the meeting of the Alaknanda and the Dhauliganga
Karnaprayag	Pindar	NCERT Class XI
Rudraprayag	Mandakini (Kali Ganga)	NCERT Class XI
Devprayag	Bhagirathi	NCERT Class XI

2.6 Tributaries of the Ganga, the delta and the river's care

Bank	Tributary	Source and where it joins (NCERT Class XI)
Right	Yamuna	Yamunotri glacier, on the western slopes of the Banderpunch range; joins the Ganga at Prayag (Allahabad)
Right	Son	Rises on the Amarkantak plateau; a large south-bank tributary
Left	Ramganga	Rises in the Garhwal hills near Gairsain; joins the Ganga near Kannauj
Left	Gomti	NCERT names it among the left-bank tributaries
Left	Ghaghara	Rises in the glaciers of Mapchachungo; joins the Ganga at Chhapra. The Sarda (called the Kali along the Indo-Nepal border) joins the Ghaghara
Left	Gandak	Rises in the Nepal Himalayas between Dhaulagiri and Mount Everest; joins the Ganga at Sonpur, near Patna

Bank	Tributary	Source and where it joins (NCERT Class XI)
Left	Kosi	Its main stream, the Arun, rises north of Mount Everest in Tibet; the "sorrow of Bihar"
Left	Mahananda	Rises in the Darjiling hills; joins the Ganga as its last left-bank tributary, in West Bengal

- **The Yamuna's own tributaries:** the Chambal, the Sind, the Betwa and the Ken join it on the right bank; they rise on the Peninsular plateau.
- **Damodar:** it occupies the eastern margins of the Chotanagpur plateau, flows through a rift valley and joins the Hugli (Hooghly). The Barakar is its main tributary. Once called the "sorrow of Bengal", it has been tamed by the Damodar Valley Corporation.
- **The delta:** the Ganga splits into two distributaries, the Bhagirathi and the Padma (Class XI). Class IX: beyond Farakka, the northernmost point of the delta, the Bhagirathi-Hooghly flows south to the Bay of Bengal, while the main stream flows into Bangladesh, where it is joined by the Brahmaputra and further down is called the Meghna. The delta formed by these rivers is the Sundarban Delta, which Class IX calls "the world's largest and fastest growing delta".
- **Namami Gange:** the Ganga clean-up and rejuvenation programme, run through the National Mission for Clean Ganga (NMCG), covers sewage treatment, riverfront development, biodiversity conservation, afforestation and monitoring of industrial effluents.

2.7 The Brahmaputra system

- **Source:** the Chemayungdung glacier of the Kailash range, near the Mansarovar lake (NCERT Class XI). Class IX: it rises in Tibet east of Mansarowar lake and is slightly longer than the Indus; most of its course lies outside India.
- **Names along its course:** the Tsangpo (meaning "the purifier") in Tibet; the Siang or Dihang where it enters India; the Brahmaputra in Assam; the Jamuna in Bangladesh.
- **Course:** it flows east for nearly 1,200 km through southern Tibet, then turns and cuts a deep gorge near Namcha Barwa (7,755 m in Class XI; Class IX prints 7,757 m and Topic 194's table of peaks 7,756 m). It enters India west of Sadiya town in Arunachal Pradesh as the Siang or Dihang.
- **Tributaries:** the Dibang (or Sikang) and the Lohit join it on the left bank, and from then on it is called the Brahmaputra. The Subansiri, Kameng, Manas and Sankosh join on the right bank. It flows about 750 km through the Assam valley and enters Bangladesh near Dhubri. In Bangladesh the Tista (Teesta) joins it on the right bank. It finally merges with the Padma.
- **Braided channels and floods:** Class IX says the Brahmaputra has a braided channel in its entire length in Assam and forms many riverine islands. Its tributaries bring a heavy load of silt; the bed rises, and the river causes floods, shifts its channel and erodes its banks in Assam and Bangladesh.

- **Majuli:** a riverine island of the Brahmaputra that Guinness World Records recognises as the world's largest river island; Britannica gives that title to Bananal Island in Brazil.
- **National Waterway 2:** 891 km of the Brahmaputra, in Assam.
- **China's hydropower project — verified dated development:** China's official government portal reports the start-of-construction announcement for the lower Yarlung Zangbo hydropower project on 19 July 2025, at a groundbreaking ceremony in Nyingchi. This establishes an announced construction start, not completion or a measured downstream impact. Source: https://english.www.gov.cn/news/202507/19/content_WS687b6a8ac6d0868f4e8f4486.html .

Source clarification,31 October2026: The supplied NCERT descriptions are edition-specific. The2020–21 chapter was freshly recovered from its archived copy; the current NCERT endpoint did not load. Conflicting lengths and Namcha Barwa heights are retained as source-attributed variants, not single definitive quiz keys. Chamoli district's official geography page independently confirms Dhauliganga–Alaknanda at Vishnuprayag and Nandakini–Alaknanda at Nandprayag; Rudraprayag district confirms Mandakini–Alaknanda at Rudraprayag. Nandprayag belongs between Vishnuprayag and Karnaprayag. These are confluence sequences, not an India boundary map. Sources: https://chamoli.gov.in/geography/ ; https://rudraprayag.gov.in/river-system/ . NW2's891km Bangladesh-border/Sadiya stretch is independently confirmed by IWAI: https://iwai.gov.in/offerings/national-waterway/national-waterways2 .

3. Extra section: places along the three rivers, from source to sea

System	Place	What happens there
Indus	Bokhar Chu, Tibet	The Indus rises near here
Indus	Chilas	The Indus enters Pakistan
Indus	Attock	The Indus leaves the hills; the Kabul joins on the right bank
Indus	Harike	On the Satluj, before it reaches the Indus: the Beas meets the Satluj
Indus	Mithankot	The Panjnad joins the Indus a little above it
Ganga	Gaumukh (Gangotri glacier)	The Bhagirathi rises
Ganga	Devprayag	The Bhagirathi and the Alaknanda meet; the river becomes the Ganga
Ganga	Haridwar	The Ganga reaches the plains
Ganga	Prayag (Allahabad)	The Yamuna joins the Ganga
Ganga	Kannauj	The Ramganga joins the Ganga
Ganga	Chhapra	The Ghaghara joins the Ganga

System	Place	What happens there
Ganga	Farakka	Northernmost point of the Ganga delta
Brahmaputra	Chemayungdung glacier	The Tsangpo rises
Brahmaputra	Namcha Barwa	The river cuts a deep gorge and turns towards India
Brahmaputra	Sadiya	The Siang or Dihang enters India west of this town; NW 2 begins here
Brahmaputra	Dhubri	The river leaves India for Bangladesh; NW 2 ends here

How to use it: read each system from top to bottom as the river flows. The Indus collects its Punjab rivers in Pakistan, the Ganga collects its big tributaries in Uttar Pradesh and Bihar, and the Brahmaputra receives the Tista only after it has entered Bangladesh.

4. Three common exam traps

1. **Mixing up NCERT's own figures.** Class XI gives the Indus 2,880 km (1,114 km in India) and Class IX 2,900 km. Class XI gives the Ganga 2,525 km; Class IX says "over 2500 km". The Indus basin is 11,65,000 sq. km in all but only 321,289 sq. km in India. In a question, check which book and which figure (total or in India) it follows.
2. **Getting the Treaty's rivers the wrong way round.** The Eastern Rivers (Ravi, Beas, Sutlej) were allocated to India; the Western Rivers (Indus, Jhelum, Chenab) flow to Pakistan, with India allowed only the uses listed in the Treaty, such as hydro-electric power. The 2025 decision kept the Treaty "in abeyance"; some government backgrounders loosely call it suspension or termination, but the decision itself used the word abeyance.
3. **Jamuna is not the Yamuna.** The Jamuna is the name of the Brahmaputra in Bangladesh. The Yamuna is the right-bank tributary that joins the Ganga at Prayag. The Brahmaputra's names run Tsangpo (Tibet), Siang or Dihang (on entering India), Brahmaputra (Assam), Jamuna (Bangladesh).

7. Sources

7.1 Sources

No.	Source	Used for
S1	NCERT, *India*: *Physical Environment* (Class XI), Chapter 3 “Drainage System”, current file (pages marked “Rationalised 2023-24”). https://ncert.nic.in/textbook/pdf/kegy103.pdf	Himalayan drainage made of the Indus, Ganga and Brahmaputra basins; perennial, snow and rain fed; gorges, V-shaped valleys, ox-bow lakes, flood plains, braided channels, deltas; Kosi as “sorrow of Bihar”; the Shiwalik or Indo-Brahma river in the Miocene (5 to 24 million years ago), its split into three, the Potwar Plateau uplift as the water divide between the Indus and Ganga systems, and the Malda gap; Indus source, length, basin, Chilas, tributaries, Kabul near Attock, Panjnad above Mithankot; Jhelum (Verinag, Srinagar, Wular, Jhang), Chenab (Chandra and Bhaga at Tandi near Keylong, 1,180 km), Ravi (west of Rohtang, Kullu hills, Sarai Sidhu), Beas (Beas Kund, 4,000 m, Harike), Satluj (Raksas Tal, 4,555 m, Shipki La, Bhakra Nangal); Ganga (Gangotri glacier near Gaumukh, 3,900 m, Devprayag, prayags, 2,525 km, State lengths, 8.6 lakh sq. km, Bhagirathi and Padma); tributaries of the Ganga and the Yamuna; Damodar; Sarda; Brahmaputra (Chemayungdung glacier, Tsangpo, 1,200 km, Namcha Barwa 7,755 m, Siang or Dihang west of Sadiya, Dibang and Lohit on the left bank, right-bank tributaries, 750 km in Assam, Dhubri, Tista on the right bank, Jamuna, Padma; floods, channel shifting and bank erosion)

No.	Source	Used for
S2	NCERT, *India*: *Physical Environment* (Class XI), Chapter 3 "Drainage System", reprint 2020-21, copy on the Internet Archive (item "ncert-kegy1"). https://ia802806.us.archive.org/28/items/ncert-kegy1/kegy103.pdf	Table 3.1, the comparison between the Himalayan and the Peninsular rivers (all six rows); Indus at 4,164 m in the Kailash range, through Ladakh and Baltistan; Satluj called Langchen Khambab in Tibet and leaving a gorge at Rupar; Alaknanda from the Satopanth glacier above Badrinath; Vishnu Prayag at Joshimath; Mandakini (Kali Ganga) at Rudra Prayag; Bhagirathi in Uttarkashi district; Yamunotri glacier on the Banderpunch range; Ramganga (Gairsain, Kannauj); Ghaghara (Mapchachungo, Chhapra); Gandak (between Dhaulagiri and Everest, Sonpur near Patna); Kosi (Arun north of Everest); Mahananda (Darjiling hills, last left-bank tributary); Damodar (rift valley, Barakar, "sorrow of Bengal", Damodar Valley Corporation); Burhi Dihing, Dhansari (South), Subansiri, Kameng, Manas, Sankosh; the Delhi ridge, with the Aravalis and the Sahyadris, separating the rivers of the Arabian Sea from those of the Bay of Bengal
S3	NCERT, *Contemporary India I* (Class IX), Chapter 3 "Drainage", reprint 2020-21, copy on the Internet Archive (item "ncert-iess1"). https://archive.org/download/ncert-iess1/iess103.pdf	"Most of the Himalayan rivers are perennial"; Indus rising in Tibet near Lake Mansarowar, entering India in Ladakh, 2,900 km; Treaty share of 20 per cent; Ganga "over 2500 km", Haridwar, Farakka as the northernmost point of the delta, Bhagirathi-Hooghly, Meghna; Sundarban Delta, "the world's largest and fastest growing delta"; Brahmaputra rising east of Mansarowar lake, slightly longer than the Indus, Namcha Barwa 7,757 m; braided channel in its entire length in Assam, riverine islands, silt, floods in Assam and Bangladesh

No.	Source	Used for
S4	Ministry of Jal Shakti (Department of Water Resources, RD and GR), "Indus Waters Treaty 1960" (note on the Treaty). https://mowr.nic.in/core/WebsiteUpload/2023/INDUS%20WATERS%20TREATY%201960.pdf	Signed on 19 September 1960, effective from 1 April 1960; Eastern Rivers (Ravi, Beas, Sutlej and tributaries) allocated to India; Western Rivers (Indus, Jhelum, Chenab and tributaries) to be let flow by India except for domestic, non-consumptive and specified agricultural and hydro-electric uses; Commissioners and the Permanent Indus Commission
S5	Press Information Bureau (PIB), "Global Solidarity with India: A United Front Against Cross-Border Terrorism", 12 May 2025. https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/may/doc2025512553601.pdf	Attack of 22 April 2025; the Cabinet Committee on Security keeping the Indus Waters Treaty in abeyance with immediate effect "until Pakistan credibly and irrevocably abjures its support for cross-border terrorism"
S6	PIB, "Operation SINDOOR: India's Strategic Clarity and Calculated Force", 14 May 2025. https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=2128748&reg=3&lang=2	Treaty "held in abeyance with immediate effect"; the same backgrounder also uses "suspension" and "termination"
S7	Wikipedia, "Indus Waters Treaty" (citing among others the Treaty text and news reports for 2025 and 2026). https://en.wikipedia.org/wiki/Indus_Waters_Treaty	Signing at Karachi by Jawaharlal Nehru and Mohammad Ayub Khan, with W.A.B. Iliff for the World Bank (IBRD); decision of 23 April 2025
S8	Wikipedia, "Medog Hydropower Station" (citing Radio Free Asia, 27 December 2024; Reuters, 21 July 2025; BBC, 21 July 2025; Times of India, 10 August 2025; Firstpost, 11 August 2025). https://en.wikipedia.org/wiki/Medog_Hydropower_Station	Project on the lower Yarlung Tsangpo in Medog County near the Great Bend; approved in December 2024; construction from July 2025
S9	National Mission for Clean Ganga (NMCG), "Namami Gange" page. https://nmcg.nic.in/NamamiGanga.aspx	Namami Gange programme carried out through the NMCG; sewage treatment, riverfront development, biodiversity conservation, afforestation and industrial effluent monitoring

No.	Source	Used for
S10	Wikipedia, "Panch Prayag" (citing Rawat, *Garhwal Himalaya*, 2002; Lochtefeld, *The Illustrated Encyclopedia of Hinduism*, 2002; Garhwal Mandal Vikas Nigam, "Prayags"). https://en.wikipedia.org/wiki/Panch_Prayag	The five prayags in downstream order; Nandakini at Nandprayag; Vishnuprayag described as the meeting of the Alaknanda and the Dhauliganga
S11	Wikipedia, "Brahmaputra River" (citing Guinness World Records, "Largest river island"; the National Waterways Act, 2016). https://en.wikipedia.org/wiki/Brahmaputra_River	Majuli as the largest river island in the world; National Waterway 2 on the Sadiya to Dhubri stretch, 891 km
S12	Inland Waterways Authority of India (IWAI), home page. https://iwai.nic.in/	IWAI constituted on 27 October 1986
S13	Deccan Herald, report of the Foreign Secretary's briefing after the Cabinet Committee on Security meeting, 23 April 2025. https://www.deccanherald.com/amp/story/india%2Findus-water-treaty-paused-attari-border-closed-visas-suspended-india-downgrades-diplomatic-ties-with-pak-pahalgam-attack-3507153	The CCS meeting on the evening of 23 April 2025, the day after the attack; Treaty "held in abeyance with immediate effect"
S14	The Week, "'No jurisdiction': India rejects World Bank court's Indus Waters ruling, says Treaty remains in abeyance", 31 August 2026. https://www.theweek.in/news/india/2026/08/31/no-jurisdiction-india-rejects-world-bank-backed-indus-waters-ruling-says-treaty-remains-in-abeyance.html	The Ministry of External Affairs statement of 31 August 2026: the decision to keep the Treaty in abeyance remains in force
S15	The Week (PTI), "Taken note of reports of China starting dam construction on Brahmaputra in Tibet: Govt tells RS", 8 August 2025. https://www.theweek.in/wire-updates/national/2025/08/08/del140-rsq-mea-dam.html	Written reply in the Rajya Sabha by the Minister of State for External Affairs, Kirti Vardhan Singh, on 7 August 2025: the Government carefully monitors developments on the Brahmaputra, including China's hydropower plans, and has pressed China on transparency and consultation with downstream countries

No.	Source	Used for
S16	Encyclopaedia Britannica, “Bananal Island”. https://www.britannica.com/place/Bananal-Island	Bananal Island in Brazil as “the largest known inland river island in the world”
S17	PIB (Ministry of Shipping), “National Waterways Projects”, 21 July 2016. https://pib.gov.in/newsite/PrintRelease.aspx?relid=147477	National Waterway 2: about 891 km, in Assam
S18	United Nations Treaty Series, Vol. 419, No. 6032, “The Indus Waters Treaty 1960” (text of the Treaty). https://treaties.un.org/doc/Publication/UNTS/Volume%20419/volume-419-I-6032-English.pdf	Signed at Karachi on 19 September 1960; Article XII: enters into force on the exchange of ratifications and takes effect retrospectively from 1 April 1960; came into force on 12 January 1961 on the exchange of ratifications at New Delhi

Topic 246 | Disaster management: Disaster Management Act 2005 and the institutional framework

1. Concept in one line

The Disaster Management Act, 2005, as amended in 2025, sets up a three-tier structure of authorities, executive committees and plans at the national, State and district levels, along with response forces, a training institute and separate response and mitigation funds. The examination asks who heads each body, who prepares and approves each plan, how the funds work and what the 2025 amendment changed.

2. Revision notes

2.1 Links with earlier topics

- **Topic 237 (environmental hazards):** the meaning of "disaster" in section 2(d) of the Act. Since 2025 an Explanation says that "man made causes" do not include "any law and order related matter or situation, or any situation arising from a law and order related matter or situation".
- **Topic 125 (cyclones):** the IMD's categories of cyclones and the cyclones that crossed the Andhra Pradesh coast.
- Left to other days: the disaster management cycle and the Sendai Framework in detail (Topic 617), preparedness for cyclones, floods and droughts (Topic 687), and Andhra Pradesh's disaster management (Topic 796).

2.2 The Act and its approach

- **The Act:** the Disaster Management Act, 2005 (Act No. 53 of 2005, dated 23 December 2005). Its long title: "An Act to provide for the effective management of disasters and for matters connected therewith or incidental thereto."
- **The 2025 amendment:** the Disaster Management (Amendment) Act, 2025 (Act 10 of 2025) is in force from 9 April 2025. It was passed by the Lok Sabha on 12 December 2024 and by the Rajya Sabha on 25 March 2025.
- **Not only relief:** the Act defines disaster management (section 2(e)) as a continuous and integrated process of planning, organising, coordinating and implementing measures, and since 2025 the term includes disaster risk reduction (Topic 237). It defines **mitigation** as "measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation".

- **Nodal ministry:** the Ministry of Home Affairs (MHA) lists disaster management among its responsibilities. The National Executive Committee is chaired by the Secretary of the ministry that has administrative control of disaster management, that is, the Union Home Secretary.

2.3 The three tiers at a glance

Level	Authority and its chair	Executive committee and its chair	Plan
National	National Disaster Management Authority (NDMA), section 3: the Prime Minister, ex officio	National Executive Committee (NEC), section 8: the Secretary to the Government of India in charge of the ministry or department having administrative control of disaster management, ex officio	National Plan (section 11)
State	State Disaster Management Authority (SDMA), section 14: the Chief Minister, ex officio	State Executive Committee (SEC), section 20: the Chief Secretary, ex officio	State Plan (section 23)
District	District Disaster Management Authority (DDMA), section 25: the Collector or District Magistrate or Deputy Commissioner, ex officio	The Act provides no district executive committee. The DDMA itself, chaired by the Collector, has a Chief Executive Officer (section 25(4)), an officer not below the rank of Additional Collector or Additional District Magistrate or Additional Deputy Commissioner	District Plan (section 31)

- **Union territories:** in a Union territory with a Legislative Assembly, other than Delhi, the Chief Minister chairs the State-level authority; in other Union territories the Lieutenant Governor or the Administrator does. In Delhi the Lieutenant Governor is the Chairperson and the Chief Minister the Vice-Chairperson.
- **Cities (since 2025):** a State Government may notify an Urban Disaster Management Authority for its capital and cities with a Municipal Corporation, except Delhi and Chandigarh. This is an enabling provision, not evidence that every eligible city already has one.

2.4 The national level

- **NDMA (section 3):** the Prime Minister is the Chairperson, ex officio. The other members, not exceeding nine, are nominated by the Chairperson. The Chairperson may designate one of them as Vice-Chairperson. Since 2025 (section 3(3A)) the day-to-day functions of the NDMA are performed by the Vice-Chairperson, or, in the Vice-Chairperson's absence, by a member designated by the Chairperson or the Vice-Chairperson.
- **Members, as reported on 30 August 2025 (PTI):** by an MHA notification under section 3(2)(b), Rajendra Singh, Krishna Swaroop Vatsa and Lt Gen Syed Ata Hasnain (Retd) were renominated, and Dinesh Kumar Aswal and Rita Missal were newly nominated, for three years from taking charge or until further orders, whichever is earlier.
- **NDMA's powers (section 6):** it has "the responsibility for laying down the policies, plans and guidelines for disaster management". Since 2025 its functions include creating a national disaster database. In an emergency the Chairperson may exercise its powers, subject to ex post facto ratification by the NDMA.
- **NEC (section 8):** it assists the NDMA. Its chair is shown in 2.3. Its other ex officio members are the Secretaries of 14 listed ministries or departments and the Chief of the Integrated Defence Staff of the Chiefs of Staff Committee. Under section 10, as substituted in 2025, its functions include acting as the coordinating body and monitoring the National Plan.
- **National Plan (section 11):** the NDMA coordinates its preparation and approval, in consultation with the Central and State Governments and other stakeholders, having regard to the National Policy. The NDMA reviews it once in every three years and updates it at least once in every five years. The first National Disaster Management Plan was launched on 1 June 2016.

2.5 The State, district, city and local levels

- **SDMA (section 14):** the Chief Minister is the Chairperson, ex officio. Other members, not exceeding eight, are nominated by the Chairperson, and the Chairperson of the State Executive Committee is a member, ex officio. The total is not to exceed nine besides the Chairperson. The Chairperson of the State Executive Committee is also the Chief Executive Officer of the SDMA, ex officio. Since 2025 the SDMA approves the State Plan, approves the District and Urban Plans, and maintains the State disaster database, giving inputs to the national one.
- **SEC (section 20):** the Chief Secretary (Chairperson), four Secretaries of such departments as the State Government thinks fit, and, since 2025, the Director General of Police of the State, all ex officio.
- **State Plan (section 23):** the SDMA coordinates its preparation and approves it. It is reviewed once in every three years and updated at least once in every five years.
- **DDMA (section 25):** the Collector (or District Magistrate or Deputy Commissioner) is the Chairperson. The elected representative of the local authority is the co-Chairperson; in the Sixth Schedule tribal areas it is the Chief Executive Member of the autonomous district council. Other ex officio members: the DDMA's Chief Executive Officer (an officer not below the rank of Additional

Collector or its equivalent), the Superintendent of Police and the Chief Medical Officer. Up to two other members, appointed by the State Government, may be taken from district level officers, disaster management experts and civil society organisations (clause rewritten in 2025).

- **District Plan (section 31):** prepared by the DDMA and approved by the SDMA. Since 2025 it is reviewed and updated at least once in every two years or earlier as necessary (before 2025: annually).
- **Urban Disaster Management Authority (section 41A, 2025):** a State Government may, by notification, constitute one for its State capital and all cities with a Municipal Corporation, except Delhi and Chandigarh. The Municipal Commissioner is the Chairperson and the District Collector the Vice-Chairperson, both ex officio. It prepares the Urban Plan.
- **Local authorities (section 41):** subject to the DDMA's directions, they train their staff, keep resources ready, make sure buildings follow the standards, and carry out relief and reconstruction. Since 2025 they also prepare a disaster management plan.

2.6 Specialised institutions

Body	Under the Act	Points to remember
National Disaster Response Force (the force)	Section 44: "for the purpose of specialist response to a threatening disaster situation or disaster". Section 45: general superintendence, direction and control with the NDMA; command and supervision with a Director General appointed by the Central Government	Raised on 19 January 2006; grown from 8 to 16 battalions, as reported on its Raising Day in January 2026
State Disaster Response Force (the force)	Section 44A (inserted in 2025): a State Government may constitute one by notification, for specialist response	Its constitution and service terms are prescribed by the State Government
National Institute of Disaster Management (NIDM)	Section 42: works within the broad policies and guidelines of the NDMA; training, research and documentation; a national level information base; training of faculty of State level training institutes	It began as the National Centre for Disaster Management (1995) and was later redesignated NIDM. Under the MHA, with a campus in Delhi and a Southern Campus at Kondapavuluru in Krishna district, near Vijayawada

2.7 The funds

Fund	Level	Who uses it, under the Act	Purpose
National Disaster Response Fund (section 46)	National	Applied as per guidelines of the Central Government made in consultation with the NDMA	"Different aspects of disaster management" (wording of 2025)

Fund	Level	Who uses it, under the Act	Purpose
National Disaster Mitigation Fund (section 47)	National	Applied as per guidelines of the Central Government made in consultation with the NDMA	"Disaster mitigation needs"
State Disaster Response Fund (section 48)	State	Made available to the State Executive Committee	Response
State Disaster Mitigation Fund (section 48)	State	Made available to the SDMA	Mitigation
District Disaster Response Fund and District Disaster Mitigation Fund (section 48)	District	Made available to the DDMA	Response and mitigation

- **How they are financed (the Act):** the national funds receive what the Central Government provides after appropriation by Parliament; the response fund can also take grants from any person or institution. The State Government must establish the four State and district funds.
- **Fifteenth Finance Commission (award for 2021-22 to 2025-26, ended March 2026):** it combined the two national funds into a National Disaster Risk Management Fund (NDRMF) and the two State funds into a State Disaster Risk Management Fund (SDRMF). In each, 80 per cent went to the response fund and 20 per cent to the mitigation fund. The response part was split into three windows, given as shares of the whole: response and relief 40 per cent, recovery and reconstruction 30 per cent, and preparedness and capacity building 10 per cent.
- **Amounts for 2021-26:** NDRMF Rs 68,463 crore (response Rs 54,770 crore; mitigation Rs 13,693 crore). SDRMF Rs 1,60,153 crore (response Rs 1,28,122 crore; mitigation Rs 32,031 crore).
- **Sharing:** the States contributed 25 per cent of the SDRMF, and the North-Eastern and Himalayan States 10 per cent.
- **FC16 recommendations, 2026-27 to 2030-31:** the official report (Volume I, paragraphs 11.54–11.60, printed pp245–246) recommends Rs 2,04,401 crore for State response and mitigation funds together: SDRF Rs 1,63,521 crore and SDMF Rs 40,880 crore, in an 80:20 split. It recommends Rs 79,406 crore for the National Funds. These are recommendations for the award period, not actual expenditure or releases.
- **What changes from FC15:** FC16 recommends flexibility between the State response-and-relief and recovery-and-reconstruction sub-windows, with preparedness and capacity building under mitigation funds. It recommends flexible sub-allocation of the National Funds. Do not carry FC15's 40:30:10 windows unchanged into the later period. Its recommended Union:State sharing remains 75:25 for non-North-Eastern/Himalayan States and 90:10 for North-Eastern/Himalayan States (paragraph11.61).
- **Law versus implementation:** section48 provides for district funds; this alone does not prove that each district fund is operational. FC16 paragraph11.1 separately discusses their non-constitution. These are different types of evidence.

2.8 The 2025 amendment: main changes

Section	What the amendment did
2	Explanation to “disaster” (law and order matters excluded) and to “disaster management” (includes disaster risk reduction); new definitions such as disaster database, resilience and Urban Plan
3(3A)	The NDMA’s day-to-day functions go to its Vice-Chairperson
20	The Director General of Police joins the State Executive Committee
41A	Urban Disaster Management Authority
44A	State Disaster Response Force

2.9 Other actors, in a line each

- **Armed forces:** under section 35(2)(f) the Central Government’s measures may include the deployment of the naval, military and air forces and other armed forces of the Union.
- **International:** the Sendai Framework for Disaster Risk Reduction 2015-2030 was taught in Topic 237 and comes in detail in Topic 617.

2.10 Verified legal update: source dated 15 May 2026

The MHA’s consolidated Disaster Management Act is expressly dated **15 May 2026** and includes the 2025 amendment, the Repealing and Amending Act2025 and Jan Vishwas (Amendment of Provisions) Act2026. The 2025 changes took effect on9 April2025; a publication/assent date is not automatically the commencement date.

- **NCMC, section8A:** Cabinet Secretary chairs the National Crisis Management Committee, the nodal body for major disasters with serious or national ramifications.
- **HLC, section8B:** the minister in charge of the Central ministry administering disaster management (Union Home Minister) chairs the High Level Committee. It provides assistance to States under section46 and approves mitigation assistance under section47. Do not confuse it with NEC, chaired by the Union Home Secretary.
- **Jan Vishwas2026 examples (effective15 May2026, consolidated p31):** section51 obstruction/ refusal under the Act, without reasonable cause, carries imprisonment up to6 months or fine or both; where this results in loss of lives or imminent danger thereof, imprisonment may extend to1 year. Section52 knowing false claim: up to6 months and fine. Section53 misappropriation: up to1 year and fine. These are statutory maxima, not automatic sentences. This topic is institutional revision, not legal advice.

Primary source: https://www.ndmindia.mha.gov.in/ndmi/images/laws-plans-and-policies/DM-Act-2005.pdf (39pages; pp12 and31). FC16 source: https://fincomindia.nic.in/asset/doc/commission-reports/16th-FC/reports/Vol1-Main-Report.pdf?v=1.0 . Earlier named-member appointments below are dated source reports, not a verified current roster.

3. Extra section: the four plans, who makes them and how often

Plan	Prepared by	Approved by	Reviewed or updated
National Plan (section 11)	The NDMA coordinates its preparation, with the Central and State Governments and other stakeholders	The NDMA	Reviewed once in every three years; updated at least once in every five years
State Plan (section 23)	The SDMA coordinates its preparation, with the local, district and urban authorities and people's representatives	The SDMA	Reviewed once in every three years; updated at least once in every five years
District Plan (section 31)	The DDMA, after consulting the local authorities	The SDMA	At least once in every two years or earlier as necessary
Urban Plan (section 41A)	The Urban Disaster Management Authority	The SDMA	As the Act and State rules provide

What the table tells us:

- The SDMA is the approving body for three of the four plans: State, District and Urban.
- Each lower plan must have regard to the plans above it: the State Plan to the National Plan, the District Plan to the National and State Plans.

4. Three common exam traps

1. **"NDRF" for two different things.** The National Disaster Response Force (section 44) is a body of trained personnel. The National Disaster Response Fund (section 46) is money. Read the question for "force" or "fund".
2. **Mixing up the State funds.** The State Disaster Response Fund is made available to the State Executive Committee, while the State Disaster Mitigation Fund is made available to the SDMA. At the district level, both funds go to the DDMA.
3. **Reading the Finance Commission's windows as shares of the response fund.** The 40, 30 and 10 per cent windows are shares of the whole risk management fund. Together they make up the 80 per cent response part; the other 20 per cent is the mitigation fund.

7. Sources

7.1 Sources

No.	Source	Used for
S1	The Disaster Management Act, 2005 (Act No. 53 of 2005), text as amended by the Disaster Management (Amendment) Act, 2025 (Act 10 of 2025), India Code. https://www.indiacode.nic.in/bitstream/123456789/2045/1/A200553.pdf	Long title; sections 2 (definitions of mitigation, disaster database, resilience, Urban Plan and others inserted in 2025), 3 and 3(3A), 6, 8, 10, 11, 14, 18, 20, 23, 25, 31, 35(2)(f), 41, 41A, 42, 44, 44A, 45, 46, 47 and 48 in their current wording; commencement of the amendments on 9 April 2025; the earlier "annually" in section 31(4)
S2	The Week (PTI), "PM nominates 2 people as new members of NDMA, 3 existing members renominated", 30 August 2025. https://www.theweek.in/wire-updates/national/2025/08/30/del1-ndma-members.html	NDMA members nominated and renominated under section 3(2)(b); three-year term; Prime Minister as chairperson
S3	Drishti IAS, "National Disaster Response Force (NDRF) Raising Day", 21 January 2026 (citing PIB). https://www.drishtiias.com/daily-updates/daily-news-analysis/national-disaster-response-force-ndrf-raising-day/print_manually	NDRF raised on 19 January 2006; grown from 8 to 16 battalions
S4	PIB, Prime Minister's greetings on the NDRF Raising Day, 19 January 2026. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2215951	Raising Day observed on 19 January (2026 release)
S5	Fifteenth Finance Commission, Report for 2021-26, Chapter 8, "Disaster Risk Management" (copy hosted by the Uttar Pradesh SDMA). https://sdma.up.gov.in/front/assets/img/upsdma/fc_recommendation3.pdf	NDRMF and SDRMF; 80:20 split between response and mitigation; windows of 40, 30 and 10 per cent; amounts for 2021-26; State contributions of 25 per cent and 10 per cent for the North-Eastern and Himalayan States
S6	Wikipedia, "National Disaster Response Force". https://en.wikipedia.org/wiki/National_Disaster_Response_Force	Cross-check of 16 battalions and of the formation date, 19 January 2006

No.	Source	Used for
S7	National Institute of Disaster Management, “About NIDM”. https://nidm.gov.in/about.asp	Origin in the National Centre for Disaster Management (1995); under the MHA; Delhi campus and Southern Campus, listed as “NIDM, Vijayawada (South Campus)”; training, research and capacity building
S8	Wikipedia, “Disaster Management Act, 2005”. https://en.wikipedia.org/wiki/Disaster_Management_Act,_2005	Amendment Bill passed by the Lok Sabha on 12 December 2024 and the Rajya Sabha on 25 March 2025; the Home Secretary as ex officio chair of the NEC
S9	Ministry of Home Affairs, “Disaster Management Division” (last updated 21 October 2026). https://www.mha.gov.in/en/divisionofmha/disaster-management-division	Disaster management among the MHA’s responsibilities
S10	Wikipedia, “Disaster management in India”. https://en.wikipedia.org/wiki/Disaster_management_in_India	National Disaster Management Plan released on 1 June 2016, the first since the Act
S11	Wikipedia, “Indian National Centre for Ocean Information Services” (citing The Hindu, “Leading with science”). https://en.wikipedia.org/wiki/Indian_National_Centre_for_Ocean_Information_Services	INCOIS at Hyderabad under the Ministry of Earth Sciences; tsunami early warning centre set up on 15 October 2007
S12	Wikipedia, “India Meteorological Department”. https://en.wikipedia.org/wiki/India_Meteorological_Department	IMD under the Ministry of Earth Sciences; forecasting, naming and warnings for tropical cyclones of the north Indian Ocean
S13	All India Radio News (newsonair.gov.in), “Lok Sabha takes up Disaster Management (Amendment) Bill, 2024”, 12 December 2024. https://www.newsonair.gov.in/lok-sabha-takes-up-disaster-management-amendment-bill-2024-for-consideration-passing-2	Lok Sabha passed the Bill on 12 December 2024

No.	Source	Used for
S14	The Week (PTI), "Parliament passes Disaster Management Amendment Bill 2024", 25 March 2025. https://www.theweek.in/wire-updates/business/2025/03/25/par32-rs-disaster-management-bill.html	Rajya Sabha passed the Bill on 25 March 2025, after the Lok Sabha in December 2024
S15	Union Home Minister's press release on the Rajya Sabha's passage of the Bill, 25 March 2025. https://www.amitshah.co.in/media/pdf_data/1743000626-202026.pdf	Passage by Parliament; 16 NDRF battalions operational (March 2025); Urban Disaster Management Authority under the State Governments
S16	Lok Sabha, Committee on Petitions (Sixteenth Lok Sabha), Forty-Second Report, presented 22 December 2017 (MHA reply). https://eparlib.nic.in/bitstream/123456789/762438/1/16_Petitions_42.pdf	The National Executive Committee is headed by the Union Home Secretary
S17	All India Radio News, "Union Minister Amit Shah to attend 20th Foundation Day celebrations of NDRF in Andhra Pradesh", 19 January 2025. https://www.newsonair.gov.in/union-minister-amit-shah-to-attend-20th-foundation-day-celebrations-of-ndrf-in-andhra-pradesh/	20th Raising Day in January 2025 (consistent with raising in 2006); NIDM Southern Campus inaugurated at Kondapavuluru, Krishna district, the place named in 2.6 (NIDM lists it as its Vijayawada campus)
S18	PRS Legislative Research, "Report of the 16th Finance Commission for 2026-31" (report summary). https://prsindia.org/policy/report-summaries/report-of-the-16th-finance-commission-for-2026-31	The Sixteenth Finance Commission's report covers 2026-27 to 2030-31 (tabled in Parliament on 1 February 2026)

Topic 247 | Artificial intelligence and machine learning

1. Concept in one line

Artificial intelligence (AI) is the ability of a digital computer or a computer-controlled robot to perform tasks commonly associated with intelligent beings, and machine learning (ML) is the part of AI in which software learns from data instead of being explicitly programmed for each task. The examination asks for the definitions, the landmark dates, the types of machine learning and India's approach to responsible AI.

2. Revision notes

2.1 What AI is

- **Recall from earlier topics.** Topic 27: ICT is the coming together of computing, telecommunications and broadcasting. Topic 46: a computer works through hardware and software, and stores data in memory. Topic 57: the Internet is the network and the World Wide Web is one service on it. Topic 67: cyber threats, among them deepfakes made with AI.

Source	Definition
Encyclopaedia Britannica	AI is "the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings"
Government of India backgrounder "Transforming India with AI" (Press Information Bureau, PIB, 12 October 2025)	"Artificial Intelligence (AI) is the ability of machines to perform tasks that normally require human intelligence."
Organisation for Economic Co-operation and Development (OECD), updated definition of an AI system (November 2023)	"An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments." The OECD adds that AI systems vary in their levels of autonomy and adaptiveness after deployment

- The common thread: a machine does work that we would otherwise call intelligent. The OECD definition stresses that the system **infers** its outputs from its inputs, and that its objectives may be explicit or implicit.

2.2 General AI and applied AI

Britannica says AI research aims at one of three goals.

Goal	What it aims at	Where it stands (Britannica)
Artificial general intelligence (AGI), also called strong AI	To build machines that think	Progress has been uneven. It is debatable whether AGI can come from ever more powerful models or needs a completely different approach
Applied AI, also called advanced information processing	Commercially viable "smart" systems, for example "expert" medical diagnosis systems and stock-trading systems	It has enjoyed considerable success
Cognitive simulation	Using computers to test theories about how the human mind works	Already a powerful tool in neuroscience and cognitive psychology

- **Two methods (Britannica).** The **top-down** (symbolic) method analyses cognition apart from the biological structure of the brain. The **bottom-up** (connectionist) method builds artificial neural networks in imitation of the brain's structure.

2.3 History in brief

Year	Landmark
1950	Alan Turing published "Computing Machinery and Intelligence" in the journal Mind (October 1950). He proposed the "imitation game", now known as the Turing test: a remote human questioner tries to tell a computer from a human by their replies
1955	John McCarthy coined the term "artificial intelligence" (Britannica). He created the programming language LISP in 1958
1956	The Dartmouth workshop founded AI research as an academic discipline. Marvin Minsky and John McCarthy organised it, with the support of Claude Shannon (Bell Labs) and Nathan Rochester (IBM)
1959	Arthur Samuel, an IBM employee, coined the term "machine learning"
1965 to 1980s	Expert systems: programs that answer questions or solve problems about one specific domain of knowledge. Dendral (begun in 1965) identified compounds from spectrometer readings; MYCIN (1972) diagnosed infectious blood diseases. In the 1980s corporations around the world adopted expert systems
1997	IBM's Deep Blue beat the reigning world chess champion, Garry Kasparov, in a six-game match

Year	Landmark
After the early 2000s	Deep learning proved to be a breakthrough technology. In 2012 AlexNet, a deep convolutional neural network, won the ImageNet image-recognition contest
2017	The transformer architecture was introduced (paper "Attention Is All You Need")
Late 2022 and the 2020s	OpenAI released the chatbot ChatGPT on 30 November 2022; the 2020s saw rapid scaling and public releases of large language models

- Britannica dates the coining of the term to 1955; the founding workshop met in 1956. Some accounts say McCarthy introduced the term at the workshop. For the year of coinage, give Britannica's 1955.

2.4 Machine learning: learning from data

- **Britannica:** machine learning, in artificial intelligence, is the discipline concerned with software that can learn autonomously.
- **Standard description:** statistical algorithms that learn from data, generalise to unseen data, and so perform tasks without being explicitly programmed. A traditional program follows instructions that a programmer writes out; an ML program is given examples and builds a mathematical model from them.
- So AI is the wide field, ML is one part of it, and deep learning (2.5) is one approach within ML.

Type	What it needs	How it works	Standard example
Supervised learning	Training data that holds both the inputs and the desired outputs (labels)	Builds a model that gives the right output for a new input	An e-mail filter: the input is an incoming e-mail, the output says spam or not spam. Predicting a person's height from factors such as age and genetics is another
Unsupervised learning	Data that has not been labelled, classified or categorised	Finds structure in the data by itself	Cluster analysis: observations are put into subsets called clusters. A common use is grouping a shop's customers by their buying habits (customer segmentation)

Type	What it needs	How it works	Standard example
Reinforcement learning	An environment in which a software agent acts, and rewards given as feedback	The agent takes actions and tries to maximise its rewards	Autonomous vehicles; learning to play a game against a human opponent. The agent learns by trial and error; in a game, a win can serve as the reward

- **The same definitions in IBM's explainers:** supervised learning uses labelled data sets, made of sample data points "along with the correct outputs or answers", and spam detection is one example; unsupervised learning analyses and clusters unlabelled data "without the need for human intervention", and is used for customer segmentation; in reinforcement learning, agents "learn to perform a task by trial and error", from rewards and punishments.

Key terms, one line each:

- **Training data:** the set of training examples from which the model is built.
- **Test data:** examples kept apart (the data is split into a training set and a test set) to check the model on data it has not seen.
- **Feature:** each example is represented as a feature vector; each entry in it is a feature, such as age in the height example.
- **Label:** the preassigned answer for an example ("spam" or "not spam") that the model is trained to predict.
- **Overfitting:** settling on a bad, overly complex theory (here, a model) "gerrymandered to fit all the past training data". Such a model fits the training data but does not generalise to unseen data. Google's machine learning glossary puts it as a model that "matches the training data so closely that the model fails to make correct predictions on new data".

2.5 Neural networks and deep learning

- An **artificial neural network** is a network of artificial neurons, built in imitation of the brain's structure (Britannica). Britannica also calls neural networks "weighted decision paths".
- The neurons are joined by connections (edges). Each has a **weight**, a number that adjusts as learning proceeds.
- **Deep learning** uses an artificial neural network with **multiple hidden layers**.
- Training a network of artificial neurons to do specific tasks was one of Turing's own ideas (Britannica).
- Keep the two ideas apart: deep learning names the kind of model (many layers of artificial neurons). Supervised, unsupervised and reinforcement learning name what the program learns from (labels, unlabelled data, or rewards).

2.6 Generative AI and large language models

- **Generative AI** is AI that generates content.
- A **large language model (LLM)** is an AI model, typically a neural network, trained on a vast amount of text for natural language processing tasks, especially language generation. The PIB backgrounder calls it "an advanced AI system that learns from vast amounts of data to understand and generate human-like text".
- Generative pre-trained transformers (GPTs) are a type of LLM pre-trained to predict the next token (which may be a word, part of a word or punctuation). LLMs are typically based on the transformer architecture (2017).
- **Hallucination:** generative LLMs have been observed to "confidently assert claims of fact which do not seem to be justified by their training data". The answer reads fluent and natural but is factually incorrect, so an LLM's output must be checked.

2.7 AI in India: where it is used

Field	What AI does there (PIB backgrounder, October 2025)
Language	Bhashini is an AI-powered platform that breaks language barriers, with translation and speech tools
Agriculture	AI predicts weather, detects pest attacks and suggests the best times for irrigation and sowing. The National Pest Surveillance System and crop health monitoring combine satellite data, weather inputs and soil analysis
Access to schemes	Kisan e-Mitra, a virtual assistant, helps farmers access government schemes such as PM Kisan Samman Nidhi
Health	AI helps doctors detect diseases early, analyse medical scans and recommend personalised treatments
Education	The Central Board of Secondary Education (CBSE) offers a 15-hour AI skill module from Class VI. DIKSHA uses AI tools such as keyword search in videos and read-aloud features

- **NITI Aayog's National Strategy for Artificial Intelligence:** a discussion paper that NITI Aayog released in June 2018. It named five sectors to focus on: healthcare; agriculture; education; smart cities and infrastructure; smart mobility and transportation. NITI Aayog's AI papers carry the tag #AIforAll.

2.8 Risks, and India's approach

NITI Aayog's paper "Responsible AI #AIforAll" (Approach Document, Part 1, February 2021) names these risks among its system considerations:

- **Explainability:** "Challenges in explaining specific decisions of AI systems makes it difficult to trust them." Opaque deep learning models make audits and debugging harder.
- **Bias:** "Inherent bias could make the decisions prejudiced against segments of population." Large-scale use can amplify such bias.
- **Privacy:** personal data may be used without the explicit consent of the persons concerned, and sensitive information can sometimes be inferred from a model's outputs.
- Hallucination (2.6) and deepfakes (Topic 67) are further risks.

The same paper lays down **seven principles for responsible AI**: (1) safety and reliability, (2) equality, (3) inclusivity and non-discrimination, (4) privacy and security, (5) transparency, (6) accountability, and (7) protection and reinforcement of positive human values. It says they are derived from the Constitution of India and the laws enacted under it.

- **IndiaAI Mission (Topic 857 has the details).** The Union Cabinet approved it on 7 March 2024 with an outlay of Rs 10,371.92 crore; the PIB backgrounder of October 2025 says this is over five years. Its seven components: IndiaAI Compute Capacity, IndiaAI Innovation Centre, IndiaAI Datasets Platform, IndiaAI Application Development Initiative, IndiaAI FutureSkills, IndiaAI Startup Financing, and Safe & Trusted AI. The IndiaAI Independent Business Division under Digital India Corporation implements it.
- **India AI Governance Guidelines.** The Ministry of Electronics and Information Technology (MeitY) released them under the IndiaAI Mission on 5 November 2025; Prof. Ajay Kumar Sood, Principal Scientific Adviser, unveiled them. They set out seven guiding principles (sutras), recommendations across six pillars and an action plan. Their guiding spirit, in Prof. Sood's words, is "Do No Harm". MeitY's Secretary said the focus is on using existing legislation wherever possible.
- **AI Impact Summit 2026.** It was held in New Delhi in February 2026 and concluded with the adoption of the New Delhi Declaration on AI Impact.

2.9 Precision and dated policy update

- **1955 versus 1956:** the original Dartmouth proposal is dated 31 August 1955 and uses the term artificial intelligence. It proposes a summer 1956 study. The proposal and the workshop are different events. Primary source: Stanford McCarthy archive, https://www-formal.stanford.edu/jmc/history/dartmouth/dartmouth.html .
- **Mathematical models, not literal brains:** neural networks are inspired by biological ideas but are not exact models of the human brain. Next-token prediction alone does not verify factual accuracy; additional training, retrieval and tools can improve reliability without guaranteeing truth. Primary GPT-2 research: https://cdn.openai.com/better-language-models/language_models_are_unsupervised_multitask_learners.pdf (2019, tokenisation discussion).

- **Validation is not the final test:** tune model choices using a separate validation set; reserve the final test for evaluation. Repeatedly adapting to test results can overfit the test set. Source: Google ML Crash Course, Datasets: Dividing the original dataset, updated 3 December 2025.
- **Six governance pillars in the 5 November 2025 Guidelines:** infrastructure; capacity building; policy and regulation; risk mitigation; accountability; institutions. These are distinct from the seven sutras, NITI's seven principles and IndiaAI Mission's seven components. Official Guidelines, contents and Part2: https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/nov/doc2025115685601.pdf .
- **21 February 2026 official report:** PIB reports the AI Impact Summit in New Delhi on 18–19 February and adoption of the New Delhi Declaration. Its cooperation framework is voluntary and non-binding, not a global AI law. This is a dated completed event, not a future summit. Source: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2231208 .

3. Extra section: one machine learning task, step by step

Take the standard example of supervised learning: an e-mail filter that sorts spam.

Step	What happens	Term
1. Collect examples	Gather e-mails that are already marked "spam" or "not spam"	Each mark is a label
2. Describe each example	Turn each e-mail into a feature vector	Each entry is a feature
3. Split the data	Keep one part for building the model and set the other part aside	Training set and test set
4. Train	The algorithm builds a mathematical model from the training set	Training
5. Test	Run the model on the e-mails it has not seen	Testing
6. Check the fit	If it does well on the training e-mails but badly on the unseen ones, it fits the past data too closely	Overfitting
7. Use	A new e-mail comes in as input; the model gives "spam" or "not spam" as output	Prediction

What changes in the other two types:

- **Unsupervised:** the same e-mails come without any marks. The program can only find structure in them, for example clusters of similar messages. It cannot say which cluster is "spam" unless someone tells it.
- **Reinforcement:** there is no fixed set of answers. An agent acts in an environment and gets rewards as feedback, as in learning to play a game against a human opponent.

4. Three common exam traps

1. **The order of the early dates.** Turing's paper with the imitation game came in 1950. Britannica says McCarthy coined the term "artificial intelligence" in 1955, while the Dartmouth workshop that founded the field met in 1956; guidebooks often put the coining in 1956. Arthur Samuel's term "machine learning" is of 1959, and Deep Blue's win over Kasparov of 1997.
2. **"AI, machine learning and deep learning mean the same thing."** AI is the wide field. Machine learning is one part of it: software that learns from data. Deep learning is one approach within machine learning, built on artificial neural networks. A chess program of 1997 and an expert system of the 1980s were AI, but they were not deep learning.
3. **Who issued which paper.** NITI Aayog issued the National Strategy for Artificial Intelligence (June 2018) and the Responsible AI paper (February 2021). The IndiaAI Mission (approved by the Cabinet in March 2024) and the India AI Governance Guidelines (November 2025) belong to MeitY, not to NITI Aayog.

7. Sources

7.1 Sources

No.	Source	Used for
S1	Encyclopaedia Britannica, "artificial intelligence" (B.J. Copeland). https://www.britannica.com/technology/artificial-intelligence	Definition of AI; Garry Kasparov against IBM's Deep Blue in their 1997 rematch in New York
S2	Encyclopaedia Britannica, "artificial intelligence": "Methods and goals in AI". https://www.britannica.com/technology/artificial-intelligence/Methods-and-goals-in-AI	Three goals of AI research: AGI (strong AI) to build machines that think, with uneven progress; applied AI (advanced information processing), commercially viable "smart" systems such as expert medical diagnosis and stock-trading systems; cognitive simulation; top-down (symbolic) and bottom-up (connectionist) methods
S3	Encyclopaedia Britannica, "artificial intelligence": "Alan Turing and the beginning of AI". https://www.britannica.com/technology/artificial-intelligence/Alan-Turing-and-the-beginning-of-AI	Turing's idea of training a network of artificial neurons for specific tasks; Deep Blue beat the reigning world champion Garry Kasparov in a six-game match (1997)
S4	Encyclopaedia Britannica, "Turing test". https://www.britannica.com/technology/Turing-test	Test proposed in 1950 by Alan M. Turing; the "imitation game"; a remote human questioner tries to tell a computer from a human by their replies

No.	Source	Used for
S5	Encyclopaedia Britannica, “John McCarthy”. https://www.britannica.com/biography/John-McCarthy	McCarthy coined the term artificial intelligence in 1955 and created LISP in 1958
S6	Encyclopaedia Britannica, “machine learning” (last updated 23 October 2026). https://www.britannica.com/technology/machine-learning	Machine learning, in artificial intelligence, as the discipline of software that can learn autonomously; artificial neural networks as “weighted decision paths”
S7	Wikipedia, “History of artificial intelligence” (secondary source). https://en.wikipedia.org/wiki/History_of_artificial_intelligence	Title of Turing’s 1950 paper; Dartmouth workshop of 1956 founding the discipline, organised by Minsky and McCarthy with the support of Shannon and Rochester; the account that McCarthy introduced the term at the workshop; expert systems defined, Dendral (1965), MYCIN (1972), adoption by corporations in the 1980s; deep learning as a breakthrough after the early 2000s; transformer architecture (2017); large language models in the 2020s
S8	Wikipedia, “Machine learning” (secondary source). https://en.wikipedia.org/wiki/Machine_learning	Definition (learn from data, generalise to unseen data, no explicit programming); Arthur Samuel coined the term in 1959; supervised learning with inputs and desired outputs, e-mail filter and height examples; unsupervised learning on data not labelled, classified or categorised, and cluster analysis; reinforcement learning with software agents, environment and rewards, autonomous vehicles and game playing; training data, training and test sets, feature vector, labels, overfitting; deep learning as multiple hidden layers; weights that adjust as learning proceeds

No.	Source	Used for
S9	Wikipedia, "Large language model" (secondary source). https://en.wikipedia.org/wiki/Large_language_model	Definition of an LLM; GPTs pre-trained to predict the next token (which may be a word, part of a word or punctuation); transformer architecture and "Attention Is All You Need" (2017); ChatGPT in late 2022; hallucination; generative AI as AI that generates content
S10	OECD.AI, "Updates to the OECD's definition of an AI system explained" (29 November 2023). https://oecd.ai/en/wonk/ai-system-definition-update	Text of the updated OECD definition of an AI system; AI systems vary in autonomy and adaptiveness after deployment
S11	PIB, Cabinet, "Cabinet Approves Ambitious IndiaAI Mission to Strengthen the AI Innovation Ecosystem", 7 March 2024. https://pib.gov.in/PressReleasePage.aspx?PRID=2012355	Approval on 7 March 2024; outlay of Rs 10,371.92 crore; seven components; implementation by the IndiaAI Independent Business Division under Digital India Corporation
S12	PIB, backgrounder "Transforming India with AI", 12 October 2025. https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/oct/doc20251015666901.pdf	Government definition of AI and of an LLM; outlay over five years; Bhashini; AI in agriculture, the National Pest Surveillance System and crop health monitoring; Kisan e-Mitra; AI in health; CBSE 15-hour AI skill module from Class VI; DIKSHA
S13	PIB, MeitY, release on the India AI Governance Guidelines, 5 November 2025 (Release ID 2186639), copy on the National e-Governance Division website. https://negd.gov.in/wp-content/uploads/2025/11/Press-Release_Press-Information-Bureau3.pdf	Release of the Guidelines under the IndiaAI Mission; unveiled by Prof. Ajay Kumar Sood; seven guiding principles (sutras), six pillars, action plan; "Do No Harm"; focus on existing legislation
S14	National e-Governance Division (MeitY), "AI Impact Summit 2026 concludes with adoption of New Delhi Declaration", 5 March 2026. https://negd.gov.in/press_release/ai-impact-summit-2026-concludes-with-adoption-of-new-delhi-declaration/	Summit held in New Delhi in February 2026; adoption of the New Delhi Declaration on AI Impact

No.	Source	Used for
S15	NITI Aayog, “Responsible AI #AIforAll: Approach Document for India, Part 1: Principles for Responsible AI”, February 2021. https://www.niti.gov.in/sites/default/files/2021-02/Responsible-AI-22022021.pdf	The seven principles; their derivation from the Constitution of India and laws enacted under it; explainability, bias and privacy as system considerations; the #AIforAll tag; release of the National Strategy for Artificial Intelligence discussion paper in June 2018 and its five focus sectors
S16	NITI Aayog, “National Strategy for Artificial Intelligence” (#AIforAll: Technology Leadership for Inclusive Growth), web page of the discussion paper, 2018. https://www.niti.gov.in/node/708	The five focus sectors named in the Executive Summary (healthcare; agriculture; education; smart cities and infrastructure; smart mobility and transportation); the #AIforAll tag
S17	OpenAI, “Introducing ChatGPT”, 30 November 2022. https://openai.com/index/chatgpt/	Release of ChatGPT by OpenAI on 30 November 2022
S18	Wikipedia, “AlexNet” (secondary source, citing Krizhevsky, Sutskever and Hinton, “ImageNet classification with deep convolutional neural networks”, and the ILSVRC 2012 results on image-net.org). https://en.wikipedia.org/wiki/AlexNet	AlexNet as a deep convolutional neural network that won the ImageNet contest (ILSVRC) in 2012
S19	A. M. Turing, “Computing Machinery and Intelligence”, Mind, vol. LIX, no. 236 (October 1950), pp. 433 to 460. https://academic.oup.com/mind/article/LIX/236/433/986238	Title, journal and date of Turing’s 1950 paper
S20	IBM, “What is supervised learning?” (Ivan Belcic and Cole Stryker; updated 2 March 2026). https://www.ibm.com/think/topics/supervised-learning	Supervised learning uses labelled data sets of sample data points along with the correct outputs or answers; spam detection as an example
S21	IBM, “What is unsupervised learning?” (updated 2 March 2026). https://www.ibm.com/think/topics/unsupervised-learning	Unsupervised learning analyses and clusters unlabelled data without the need for human intervention; clustering groups data by similarities; customer segmentation and purchasing habits as uses

No.	Source	Used for
S22	IBM, “What is reinforcement learning?” (Jacob Murel and Eda Kavlakoglu; updated 2 March 2026). https://www.ibm.com/think/topics/reinforcement-learning	Agents learn to perform a task by trial and error, from rewards and punishments, and aim to maximise cumulative rewards
S23	Google for Developers, Machine Learning Glossary: ML Fundamentals. https://developers.google.com/machine-learning/glossary/fundamentals	Overfitting: a model that matches the training data so closely that it fails to make correct predictions on new data; a label in a spam detection data set is “spam” or “not spam”

Topic 248 | Classification: odd one out

1. Concept in one line

A classification question gives four words, letter groups or numbers, of which three share a property and one does not, and asks for the one that does not belong (the odd one out); you find the property the three share and check that exactly one option lacks it.

2. Revision notes

2.1 What a classification question asks

- Classification means putting things into groups by a common property. In an odd one out question, three options share a property and the fourth does not; the fourth is the answer.
- Recall from earlier topics:
  - Topic 218 (analogy): word relations such as kind and class, part and whole, and function; number rules such as the square plus 1.
  - Topic 228 (letter series): positions from A = 1 to Z = 26, the position from Z = 27 - position, and opposite letters that add up to 27. Its position table is repeated in 2.4.
  - Topics 78 and 148 (number series): differences between terms; the squares from 1 to 30, the cubes from 1 to 15, the 25 primes up to 100 and the square-root test.
- Left to other days: series completion with an odd term (Topic 498) and coding (Topics 278 and 438).

2.2 The types of classification

Type	What is compared	Rules most used	Taught in
Word or meaning	What each word means	Category, function, habitat, part and whole	2.3
Letter	The positions of the letters in the alphabet	Positions, gaps, opposites, vowels, symmetry	2.4
Number	The properties of each number	Primes, squares, cubes, $n^2 + 1$ or $n^2 - 1$, digit sums, divisibility, odd and even	2.5

Figure classification (four or five drawings, one of which differs) also appears in papers; this topic focuses on words, letters and numbers; figure-only classification is not covered here.

2.3 Word classification

Ask four questions of every word: what kind of thing is it, what does it do, where does it live or grow, and what is it a part of?

Rule	What the three share	Example	Odd one, and why
Category	They are the same kind of thing	Rose, Jasmine, Marigold, Mango	Mango: it is a fruit; the other three are flowers
Function	They do the same work	Knife, Saw, Axe, Spoon	Spoon: the other three are used to cut
Habitat	They live in the same kind of place	Whale, Shark, Octopus, Camel	Camel: it is a desert animal; the other three live in the sea
Part and whole	Three are parts of the fourth	Wheel, Engine, Brake, Car	Car: it is the whole; the other three are its parts

- Use the common meaning of each word, not a private link of your own.
- Kind and class from Topic 218 is the category rule: a rose is a kind of flower.
- Facts on animals that items often use: mammals feed their young on milk; all living mammals give birth to live young except the five species of monotremes, which lay eggs; mammals are a group separate from birds and reptiles. Bats are mammals and the only mammals that can truly fly. Whales, seals, lions and camels are mammals.

2.4 Letter classification

Write the position of every letter first. The table and the opposite-letter rule are those of Topic 228.

Letter	From A	From Z	Letter	From A	From Z
A	1	26	N	14	13
B	2	25	O	15	12
C	3	24	P	16	11
D	4	23	Q	17	10
E	5	22	R	18	9
F	6	21	S	19	8
G	7	20	T	20	7
H	8	19	U	21	6
I	9	18	V	22	5
J	10	17	W	23	4

Letter	From A	From Z	Letter	From A	From Z
K	11	16	X	24	3
L	12	15	Y	25	2
M	13	14	Z	26	1

- In every row the two numbers of a letter add up to 27: position from A + position from Z = 27.
- **Opposite letters add up to 27.** A-Z, B-Y, C-X, D-W, E-V, F-U, G-T, H-S, I-R, J-Q, K-P, L-O, M-N. The opposite of a letter is the letter at 27 minus its position: the opposite of H (8) is the 19th letter, S.

Rule	What the three share	Example	Odd one, and why
Positions	The positions have one property	D, P, Y, K	K (11): D (4), P (16) and Y (25) stand at square positions
Gaps	The gaps inside each group are equal	DGJ, GJM, NQT, SUX	SUX: gaps +2, +3; the other three have +3, +3
Opposites	Each pair is a pair of opposite letters	BY, HS, JQ, FV	FV: 6 + 22 = 28; the other pairs add up to 27
Vowels	A vowel stands at the same place	GAV, KIV, XIQ, IKH	IKH: the vowel comes first; in the other three it is in the middle
Symmetry	The gaps read the same from both ends	CDFG, OPRS, UVXY, CDFH	CDFH: gaps +1, +2, +2; the other three have +1, +2, +1

- A gap is the later position minus the earlier position, as in Topic 228. In a group of three letters, “equal gaps” means the two gaps are the same, whatever their size.
- **Vowels.** English has five vowel letters: A, E, I, O and U. Y and W can act as vowels inside some words, but in letter classification only A, E, I, O and U are counted as vowels.
- **Symmetry** here means the pattern of gaps. Questions on the shape of letters (letters that look the same in a mirror) depend on how a letter is drawn, so they are left out of this text-only programme.

2.5 Number classification

Rule	What the three share	Example	Odd one, and why
Primes	Three are prime	41, 43, 59, 57	57 = 3 × 19, so it is composite
Squares	Three are perfect squares	36, 49, 81, 76	76 lies between 64 and 81
Cubes	Three are perfect cubes	27, 125, 216, 80	80 lies between 64 and 125

Rule	What the three share	Example	Odd one, and why
$n^2 + 1$ or $n^2 - 1$	Three are 1 more, or 1 less, than a square	15, 35, 48, 52	52: 15 = 16 - 1, 35 = 36 - 1, 48 = 49 - 1, but 52 = 49 + 3
Digit sums	The digit sums are equal or share a factor	153, 351, 423, 327	327: digit sum 12; the other three have digit sum 9
Divisibility	Three are multiples of one number	42, 56, 98, 48	48: 42, 56 and 98 are multiples of 7; 48 is not
Odd and even	Three are odd, or three are even	29, 61, 69, 54	54 is even; the other three are odd

- **Prime.** A natural number greater than 1 that is not a product of two smaller natural numbers. 1 is not prime. Every prime other than 2 is odd. A natural number greater than 1 that is not prime is composite. To test a number, use the square-root test of Topic 148: below 121 (= 11^2), dividing by 2, 3, 5 and 7 is enough.
- **Square and cube.** A perfect square is the square of a whole number; in base 10 a square ends only in 0, 1, 4, 5, 6 or 9. The cube of n is n × n × n. 64 is both a square (8×8) and a cube ($4 \times 4 \times 4$).
- **Digit sums and divisibility.** A number is divisible by 3 (or by 9) if and only if the sum of its digits is divisible by 3 (or by 9). Divisible by 2: the last digit is even. Divisible by 5: the last digit is 0 or 5. Divisible by 4: the last two digits form a number divisible by 4.

2.6 The method in steps

1. **Find the rule the majority follow.** Look for a property that three of the four share.
2. **Check that only one option breaks it.** The other three must all keep the rule. If two options break it, or none does, it is not the rule.
3. **Test several rules before choosing.** Go through the rules of 2.3, 2.4 or 2.5, not only the first one you notice. Use the stated relation where supplied. Otherwise prefer a simple, natural shared relation; if equally natural rules yield different answers, flag ambiguity rather than claiming absolute uniqueness.
4. **Prefer the most specific rule.** A broad rule that fits all four decides nothing. In 42, 56, 98, 48 “all are even” fits all four; the narrower “multiples of 7” leaves out 48.

2.7 Two defensible answers in word classification

- A word carries many properties, so one set of words can hold two rules, each of which leaves out a different word. Arithmetic checks whether a proposed numerical or letter rule holds, but it does not prove that no alternative rule exists. Ambiguity can affect all three types.
- **An ambiguous set: Lion, Tiger, Whale, Bat.**
  - Rule 1: three live on land; the whale lives in water. Answer: Whale.
  - Rule 2: three cannot fly; the bat is the only mammal that can truly fly. Answer: Bat.

    - Both rules are facts, and each leaves out exactly one word. The set has two defensible answers, so it is badly set.
- **How a well-set question reduces ambiguity.** Specify the relation to be tested. In Lion, Tiger, Leopard, Bat, asking about membership of the cat family gives Bat. This does not establish that no other imaginable property could single out a different word.
- In the exam, if you find two answers, check both rules again against all four words before you choose.

3. Extra section: a drill of eight questions with full working

Each worked set below illustrates the named relation. The answer is checked under that relation, not claimed to be unique under every imaginable rule.

Drill 1. Letters: opposite pairs

HS, JQ, GT, MP Options: (a) HS, (b) JQ, (c) GT, (d) MP.

- Add the positions: H (8) + S (19) = 27, J (10) + Q (17) = 27, G (7) + T (20) = 27, M (13) + P (16) = 29.
- Three pairs are opposite letters; MP is not. The opposite of M is N.
- Other rules: no pair has a vowel; in every pair the first letter is from A to M and the second from N to Z; the gaps (11, 7, 13 and 3) are all different, so the gap is not the rule.
- Answer: (d) MP.

Drill 2. Letters: the place of the vowel

AHL, BOV, HUX, FOT Options: (a) AHL, (b) BOV, (c) HUX, (d) FOT.

- In BOV, HUX and FOT the vowel (O, U, O) is the middle letter. In AHL the vowel A is the first letter.
- Other rules: every group has exactly one vowel, so counting vowels decides nothing; all four are in alphabetical order; the gaps (+7, +4; +13, +7; +13, +3; +9, +5) show no shared pattern.
- Answer: (a) AHL.

Drill 3. Letters: symmetry of gaps

BCFG, NQST, FHKM, RTWY Options: (a) BCFG, (b) NQST, (c) FHKM, (d) RTWY.

- BCFG: 2, 3, 6, 7, gaps +1, +3, +1. FHKM: 6, 8, 11, 13, gaps +2, +3, +2. RTWY: 18, 20, 23, 25, gaps +2, +3, +2.
- NQST: 14, 17, 19, 20, gaps +3, +2, +1. Its gaps do not read the same from both ends.
- Other rules: no group has a vowel; all four are in alphabetical order; NQST is also the only group whose middle gap is not +3, which gives the same answer.
- Answer: (b) NQST.

Drill 4. Numbers: primes

41, 61, 71, 91 Options: (a) 41, (b) 61, (c) 71, (d) 91.

- All four are below 121, so dividing by 2, 3, 5 and 7 is enough. None of these divides 41, 61 or 71, so they are prime.
- 91 = 7 × 13, so it is composite.
- Other rules: all four are odd and all end in 1; the digit sums (5, 7, 8, 10) show no pattern.
- Answer: (d) 91.

Drill 5. Numbers: cubes, with a number that is both

64, 81, 216, 512 Options: (a) 64, (b) 81, (c) 216, (d) 512.

- 64 = 4^3, 216 = 6^3 and 512 = 8^3. 81 = 9 × 9 is a square, not a cube: 4^3 = 64 and 5^3 = 125.
- The square rule does not decide: 64 and 81 are squares, 216 and 512 are not, so it splits the set two and two. 64 is both a square and a cube.
- 81 is also the only odd number, which gives the same answer.
- Answer: (b) 81.

Drill 6. Numbers: digit sums and divisibility by 9

279, 318, 378, 549 Options: (a) 279, (b) 318, (c) 378, (d) 549.

- Digit sums: 2 + 7 + 9 = 18, 3 + 1 + 8 = 12, 3 + 7 + 8 = 18, 5 + 4 + 9 = 18.
- A digit sum of 18 is divisible by 9, so 279 (9 × 31), 378 (9 × 42) and 549 (9 × 61) are divisible by 9. 318 has digit sum 12, which is divisible by 3 but not by 9 (318 = 3 × 106).
- Other rules: all four are divisible by 3, so that rule decides nothing; 279 and 549 are odd while 318 and 378 are even, two and two.
- Answer: (b) 318.

Drill 7. Words: function

Pen, Pencil, Chalk, Duster Options: (a) Pen, (b) Pencil, (c) Chalk, (d) Duster.

- A pen, a pencil and chalk are used to write. A duster is used to wipe writing off.
- Where they are used does not decide: chalk and duster are used on a blackboard, pen and pencil on paper, two and two.
- Answer: (d) Duster.

Drill 8. Words: the most specific rule

Bat, Whale, Seal, Crow Options: (a) Bat, (b) Whale, (c) Seal, (d) Crow.

- "All are animals" fits all four and decides nothing. The narrower rule: the bat, the whale and the seal are mammals; the crow is a bird.
- Other rules split the set two and two: the bat and the crow can fly; the whale and the seal live in the sea.
- Answer: (d) Crow.

4. Three common exam traps

1. **Numbers that only look prime.** 51 and 87 are odd and do not end in 5, so they look prime, but 51 = 3 × 17 and 87 = 3 × 29. Apply the square-root test before you call a number prime.
2. **A difference that sets every option apart.** If each of the four letter groups has a different gap size, or each number has a different digit sum, that feature makes all four different and so cannot pick out one. Look for what three share, such as two equal gaps inside each group.
3. **A rule that two options break.** In 16, 27, 36, 49 a candidate who picks 49 because it is odd forgets that 27 is odd too: odd and even split the set two and two. The rule that leaves out exactly one is "perfect square": 16, 36 and 49 are squares, and 27 is not.

7. Sources

7.1 Sources

No.	Source	Used for
S1	Wikipedia, "Prime number" (citing Gardiner, *The Mathematical Olympiad Handbook*, Oxford University Press, 1997, for the definition of prime and composite). https://en.wikipedia.org/wiki/Prime_number	A prime is a natural number greater than 1 that is not a product of two smaller natural numbers; 1 is not prime; the 25 primes less than 100 (37, 41, 43, 59, 61, 71 prime; 51, 57, 87, 91 not in the list); every prime other than 2 is odd; a natural number greater than 1 that is not prime is composite
S2	Wikipedia, "Square number" (list cited to OEIS sequence A000290). https://en.wikipedia.org/wiki/Square_number	A perfect square is an integer that is the square of an integer; the list of squares (16, 36, 49, 64, 81, 100, 144, 256, 289); in base 10 a square ends only in 0, 1, 4, 5, 6 or 9

No.	Source	Used for
S3	Wikipedia, "Cube (algebra)" (references include Hardy and Wright, *An Introduction to the Theory of Numbers*, 5th edition, 1980; list cited to OEIS A000578). https://en.wikipedia.org/wiki/Cube_(algebra)	The cube of n is the result of multiplying three instances of n together; the perfect cubes 8, 27, 64, 125, 216, 512; 64 is a square (8 × 8) and a cube (4 × 4 × 4)
S4	Wikipedia, "Divisibility rule" (citing Gardner, "Mathematical Games", *Scientific American*, 1962; Apostol, *Introduction to Analytic Number Theory*, 1976). https://en.wikipedia.org/wiki/Divisibility_rule	Divisibility by 3 or 9 if and only if the digit sum is divisible by 3 or 9; by 2, last digit even; by 4, last two digits divisible by 4; by 5, last digit 0 or 5
S5	Wikipedia, "English alphabet" (bibliography includes Upward and Davidson, *The History of English Spelling*, 2011). https://en.wikipedia.org/wiki/English_alphabet	The 26 letters in order, A to Z, from which the positions in the 2.4 table are counted; the five vowel letters A, E, I, O, U; W and Y may act as either vowel or consonant
S6	Wikipedia, "Mammal". https://en.wikipedia.org/wiki/Mammal	Mammals feed their young with milk from mammary glands; all modern mammals give birth to live young except the five species of monotremes, which lay eggs; mammals are distinguished from reptiles and birds; bats are mammals and the only mammals that can truly fly; whales, seals, lions and camels are mammals; camels are desert mammals

Topic 249 | Data interpretation: pie charts

1. Concept in one line

A pie chart shows one whole divided into parts, each part drawn as a sector whose central angle is its share of 360 degrees, and a data-interpretation question asks you to turn those angles or percentages into values, ratios, differences and comparisons. The exam tests whether you convert correctly between angle, percentage and value, and whether you compare values, not shares, when two charts have different totals.

2. Revision notes

2.1 What a pie chart shows, and when it is the right chart

- A circle graph shows the relationship between a whole and its parts. The whole circle is divided into sectors, and the size of each sector is proportional to the part it stands for. A circle graph is also called a pie chart.
- The total angle at the centre of a circle is 360°. The central angle of a sector is its fraction of the whole × 360°.
- Every sector is a part of the same whole, so the fractions add up to 1, the percentages to 100 and the central angles to 360°.
- A pie chart suits one whole split into a few categories, such as a family budget or the sales of a shop on one day. It cannot show more than a few values clearly, and an angle is judged less accurately than a length, so for comparing many categories a bar graph is usually the better choice.

Form	What it shows best	What it does not show well
Table (Topic 119)	Exact figures, many rows and columns	The pattern at a glance
Bar graph (Topic 149)	Comparison of separate categories or years by length	The share of each part in one whole
Pie chart	The share of each part in one whole	Many categories; change over time (line graphs, Topic 449)

Earlier topics used here, in a line each:

- **Topic 29:** a percentage is a fraction with denominator 100, and the parts of a whole add up to 100%.
- **Topic 119:** share = part ÷ total × 100, with the total of the same year as the base.
- **Topic 149:** read every value from the scale; the largest rise in number need not be the largest in per cent.
- **Topic 159:** percentage change = (new - old) ÷ old × 100; “A is r% more than B” takes B as the base.

- **Topic 169:** to divide a quantity in a ratio, each share is its own number of parts out of the total number of parts.

2.2 Pie charts in this pack

The tables below accompany the separate pictograph teaching sequence. Each chart identifies sector angles or percentages and the total value. All practice datasets are illustrative, not official statistics.

Chart 1. How a family spends its monthly budget of Rs 36,000 (illustrative figures).

Item	Central angle	Fraction of the whole	Percentage	Value (Rs)
Food	120°	1/3	33 1/3%	12,000
House rent	90°	1/4	25%	9,000
Education	60°	1/6	16 2/3%	6,000
Transport	36°	1/10	10%	3,600
Savings	54°	3/20	15%	5,400
Total	360°	1	100%	36,000

Note: the figures in Charts 1 to 3 are made up for practice; they are not official data.

2.3 Converting between angle, percentage and value

From	To	Rule	Example
Percentage	Angle	Multiply by 3.6 (because 360 ÷ 100 = 3.6)	25% × 3.6 = 90°; 12.5% × 3.6 = 45°
Angle	Percentage	Divide by 3.6	72° ÷ 3.6 = 20%; 54° ÷ 3.6 = 15%
Angle	Fraction	Angle ÷ 360, then reduce	120/360 = 1/3
Value	Angle	Value ÷ total × 360	9,000/36,000 × 360 = 90°
Angle	Value	Angle ÷ 360 × total	54/360 × 36,000 = 5,400
Percentage	Value	Percentage ÷ 100 × total	15/100 × 36,000 = 5,400

- **Check the whole first.** Add the angles: they must come to 360°. Add the percentages: they must come to 100. If one sector is not given, find it as 360° minus the sum of the others (or 100 minus the others).
- **Dividing in a ratio (Topic 169).** Drawing a pie chart is dividing 360° in the ratio of the parts. Sales of Rs 320, 120, 160, 80 and 40 stand in the ratio 8 : 3 : 4 : 2 : 1, which is 18 parts; one part is 360 ÷ 18 = 20°, so the angles are 160°, 60°, 80°, 40° and 20°.

2.4 The calculations on one chart

What is asked	Rule	Example from Chart 1	Answer
Value of a sector	Angle ÷ 360 × total	House rent, 90°	Rs 9,000
Total from one sector	Value of the sector × 360 ÷ its angle	Savings of Rs 5,400 at 54°	5,400 × 360 ÷ 54 = Rs 36,000
Ratio of two sectors	Ratio of their angles (or percentages)	Food to education, 120° : 60°	2 : 1
Difference of two sectors	Difference of the angles ÷ 360 × total	Food minus house rent, 30°	Rs 3,000
By what per cent A is more than B	(A - B) ÷ B × 100; angles can be used directly	Food over house rent: 30/90 × 100	33 1/3%
By what per cent B is less than A	(A - B) ÷ A × 100	House rent under food: 30/120 × 100	25%

- **Value of one degree.** Divide the total by 360 once: in Chart 1 each degree is 36,000 ÷ 360 = Rs 100. Then house rent is 90 × 100 = Rs 9,000 and the 30° gap between food and house rent is Rs 3,000.
- **No total is needed for a ratio or a "per cent more".** Both sectors are fractions of the same total, so the total cancels: food : education = 120 : 60 = 2 : 1, whatever the budget.
- **The base of "more than" (Topic 159).** "Food is more than house rent by what per cent?" takes house rent as the base: 33 1/3%. "House rent is less than food by what per cent?" takes food as the base: 25%.
- **From one sector to another.** On another budget (NCERT's Example 1, Section 2.7), if savings of Rs 3,000 are 15% of the whole, then a 10% sector is 3,000 ÷ 15 × 10 = Rs 2,000. The total need not be found first.

2.5 Two pie charts with different totals

- A share is a fraction of its own whole. On two charts with different totals, the same angle or percentage stands for different values, so compare the values, not the shares: value = share × total.
- A smaller share of a larger total can be a larger value.

Chart 2. Students in a college, by stream, 2020 and 2025 (illustrative figures). Total: 2,400 students in 2020 and 3,600 in 2025.

Stream	Share, 2020	Number, 2020	Share, 2025	Number, 2025
Arts	25%	600	18%	648
Commerce	30%	720	35%	1,260

Stream	Share, 2020	Number, 2020	Share, 2025	Number, 2025
Science	40%	960	32%	1,152
Vocational	5%	120	15%	540
Total	100%	2,400	100%	3,600

- **Worked example.** The share of science fell from 40% to 32%, by 8 percentage points (Topic 29). But the number of science students rose from 960 to 1,152, by 192, which is 192/960 × 100 = 20%. A reader who compares only the two sectors would say science shrank; in number it grew.
- **A quick check by factors.** New value ÷ old value = (new share ÷ old share) × (new total ÷ old total) = 32/40 × 3,600/2,400 = 0.8 × 1.5 = 1.2, a rise of 20%.
- Only when the two totals are equal can the shares, or the angles, be compared directly.

2.6 Quick methods: fractions of 360°

Central angle	Fraction of the whole	Percentage
180°	1/2	50%
120°	1/3	33 1/3%
90°	1/4	25%
72°	1/5	20%
60°	1/6	16 2/3%
45°	1/8	12 1/2%
36°	1/10	10%
30°	1/12	8 1/3%
18°	1/20	5%

- 1% is 3.6°, 10% is 36° and 5% is 18°. Build other angles from these: 54° = 36° + 18° = 10% + 5% = 15%.
- Use the fraction when the angle is in the table: 45° of Rs 7,200 is one-eighth, Rs 900.

2.7 How NCERT teaches it

The NCERT *Mathematics* textbook for Class VIII (the textbook used before *Ganita Prakash*), chapter "Data Handling", Section 4.2 "Circle Graph or Pie Chart" and Section 4.2.1 "Drawing pie charts" (numbered as on the SATHEE portal of IIT Kanpur), teaches the topic through these examples:

NCERT example	Data	What it shows
A child's day	24 hours: sleep 8 hours, school 6 hours	Sleep is 8/24 = 1/3 of the circle, school 6/24 = 1/4

NCERT example	Data	What it shows
Favourite ice-cream flavours	Chocolate 50%, vanilla 25%, other flavours 25%	Central angles 180°, 90° and 90°
Family expenditure (Example 1)	Education 15%, equal to savings; savings Rs 3,000	A 10% sector is then Rs 2,000
Sales of a bakery (Example 2)	Rs 720: ordinary bread 320, biscuits 120, cakes and pastries 160, fruit bread 80, others 40	Fractions 4/9, 1/6, 2/9, 1/9, 1/18; angles 160°, 60°, 80°, 40°, 20°

- To draw a pie chart, NCERT finds each central angle as a fraction of 360°, draws a circle with centre O and a radius OA, marks the first angle AOB with a protractor, and then marks the other sectors in turn.
- NCERT also asks students to add the fractions and check that they make one whole, and to decide which kind of graph suits which data.

3. Extra section: a drill of eight questions on two charts

Chart 3. Area under crops in a mandal (illustrative figures). Total: 7,200 hectares.

Crop	Central angle
Paddy	135°
Cotton	90°
Groundnut	60°
Pulses	45°
Others	30°

The angles add up to 135 + 90 + 60 + 45 + 30 = 360°. Each degree stands for 7,200 ÷ 360 = 20 hectares.

1. **What is the area under cotton?** 90/360 × 7,200 = 1/4 × 7,200 = 1,800 hectares.
2. **What percentage of the area is under groundnut?** 60 ÷ 3.6 = 16 2/3%. Check: 60° is 1/6 of the circle.
3. **What is the ratio of the area under paddy to that under pulses?** 135 : 45 = 3 : 1. The total is not needed.
4. **By what per cent is the area under paddy more than that under cotton, and by what per cent is cotton less than paddy?** Paddy over cotton: (135 - 90) ÷ 90 × 100 = 50%, with cotton as the base. Cotton under paddy: 45 ÷ 135 × 100 = 33 1/3%, with paddy as the base.
5. **Next year paddy gains 300 hectares and every other crop stays the same. What will be the central angle of paddy?** Paddy = 2,700 + 300 = 3,000 hectares; total = 7,500 hectares. Angle = 3,000/7,500 × 360 = 144°. Every other angle shrinks, because the total has grown.

Questions 6 to 8 use Chart 2 (Section 2.5).

1. **The share of arts fell from 25% to 18%. Did the number of arts students fall?** No. 2020: 25% of 2,400 = 600. 2025: 18% of 3,600 = 648. The number rose by 48, which is 48/600 × 100 = 8%.
2. **Which stream had the largest percentage increase in number from 2020 to 2025?** Arts 8%; commerce 720 to 1,260, a rise of 540/720 × 100 = 75%; science 20%; vocational 120 to 540, a rise of 420/120 × 100 = 350%. Answer: vocational. The largest rise in number is commerce's (540), but its base is larger.
3. **Find the central angle of commerce in 2025, and then get the total back from that sector alone.** 35 × 3.6 = 126°. Total = 1,260 × 360 ÷ 126 = 3,600 students.

4. Three common exam traps

1. **An angle is not a percentage.** A sector of 99° is 99 ÷ 3.6 = 27.5% of the whole, not 99%. To get a value from an angle divide by 360; to get one from a percentage divide by 100. Mixing the two makes every answer wrong by a factor of 3.6.
2. **Two charts, two totals.** A share of 40% of 500 is 200, and a share of 25% of 1,000 is 250. The smaller sector here is the larger value. Before comparing sectors across two pie charts, multiply each share by its own total.
3. **Per cent more takes the second item as the base.** If one sector is 75° and another 60°, the first is 15/60 × 100 = 25% more than the second, but the second is 15/75 × 100 = 20% less than the first. Within one chart the angles can be used directly, because the total cancels.

7. Sources

7.1 Sources

No.	Source	Used for
S1	NCERT, *Mathematics*, Class VIII, chapter “Data Handling” (the textbook used before *Ganita Prakash*), Section 4.2 “Circle Graph or Pie Chart”, Section 4.2.1 “Drawing pie charts”, Exercise 4.1 and the chapter summary, read on the SATHEE portal of IIT Kanpur, where it is numbered Chapter 4. https://sathee.iitk.ac.in/ncert-books/class-08/mathematics/chapter-4-data-handling	A circle graph shows the relationship between a whole and its parts; the circle is divided into sectors whose size is proportional to the part; a circle graph is also called a pie chart; the total angle at the centre is 360° and each central angle is a fraction of 360°; checking that the fractions add up to one; the drawing steps (centre O, radius OA, angle AOB with a protractor); the examples of a child’s day, ice-cream flavours (50%, 25%, 25% as 180°, 90°, 90°), family expenditure (savings Rs 3,000 at 15%, so 10% is Rs 2,000) and bakery sales of Rs 720 (angles 160°, 60°, 80°, 40°, 20°); choosing the kind of graph that suits the data
S2	Wikipedia, “Pie chart” (citing Stephen Few, “Save the Pies for Dessert”, 2007, for the limit on the number of values; William S. Cleveland, *The Elements of Graphing Data*, 1985, pp. 86-87, for angle against length; Tufte, *The Visual Display of Quantitative Information*, 2001, and Wilkinson, *The Grammar of Graphics*, 2005, for the difficulty of comparisons). https://en.wikipedia.org/wiki/Pie_chart	A pie chart is a circular statistical graphic divided into slices; arc length, central angle and area are proportional to the quantity; the central angle for a fraction Q of the total is 360Q degrees; pie charts cannot show more than a few values clearly; comparison by angle is less accurate than comparison by length; bar charts are a commonly recommended alternative
S3	Encyclopaedia Britannica, “pie chart”. https://www.britannica.com/topic/pie-chart	A pie chart, also known as a circle graph, is a circular chart divided into segments by radii; the size of each slice is proportional to its class; it shows proportions within a whole; a budget breakdown as a common example

Topic 250 | Current affairs: Chabahar port and India's connectivity with Iran and Central Asia

1. Concept in one line

Chabahar is a port in south-eastern Iran. India Ports Global Chabahar Free Zone (IPGCFZ), the special purpose vehicle (SPV) in Iran of India Ports Global Limited (IPGL), took over the interim operation of a part of the Shahid Beheshti terminal in December 2018; IPGL itself signed a 10-year contract with Iran's Ports and Maritime Organisation (PMO) on 13 May 2024. The aim is to give India a route to Afghanistan and Central Asia through Iran. The examination asks about its location, the Indian bodies and contracts, the linked corridors (the INSTC and the Ashgabat Agreement) and the effect of the United States (US) sanctions on Iran.

2. Revision notes

2.1 Why this topic is in current affairs

Chabahar links infrastructure, regional connectivity and foreign-policy risk. The February 2026 magazine selected the port in the context of sanctions-related uncertainty. These notes distinguish verified historical agreements from changing operating or sanctions conditions. A contract is not proof of immunity from third-country measures.

2.2 How to interpret sanctions-related developments

- A sanctions exception, its revocation, and a later conditional waiver are separate instruments. Their scope and dates must be read in the relevant official text.
- A time-limited waiver is not permanent protection; a past waiver does not prove the position on a later date.
- This teaching set does not certify the current sanctions permission or the terminal's present operating status. It does not assert that India has exited, that a fresh waiver exists, or that all related rail links are complete.
- Commercial connectivity needs workable finance, insurance, shipping and customs arrangements as well as physical infrastructure.

2.3 Where Chabahar is, and its two terminals

- **Location:** in Sistan and Baluchestan province, in south-eastern Iran, on the Gulf of Oman.
- **Gwadar:** Pakistan's Gwadar port lies to the east.
- **Two terminals:** Shahid Kalantari and Shahid Beheshti. India's part is at **Shahid Beheshti**.

- In July 2022 the Ministry of Ports, Shipping and Waterways called Chabahar the commercial transit centre for the region, and especially for Central Asia.

2.4 India's bodies, contracts and money

Item	What the official sources say
India Ports Global Limited (IPGL)	A special purpose vehicle (SPV) based in Mumbai, set up under the Union shipping ministry to equip the port and start its operations
India Ports Global Chabahar Free Zone (IPGCFZ)	The SPV of IPGL in Iran. It took over the interim operation of a part of Shahid Beheshti port with effect from 24 December 2018. Its office at Chabahar was opened jointly by delegations of India, Iran and Afghanistan
Ports and Maritime Organisation (PMO) of Iran	The Iranian party to the long-term main contract of 13 May 2024
Early steps	Engagement with Iran on the port goes back to 2003. An India-Iran memorandum of understanding (MoU) was signed in May 2015
Bilateral contract of 23 May 2016	Described by the Ministry (January 2019) as a 10-year contract. The Ministry (January 2021) says it was signed with a total value of USD 85 million, for equipping, mechanising and starting operations at Shahid Beheshti port (Chabahar development, Phase I)
Interim and short-term arrangements	An interim arrangement in February 2018, then a formal short-term contract on 6 May 2018
Long-term main contract of 13 May 2024	Signed at Chabahar between IPGL and the PMO, in the presence of the Union Minister of Ports, Shipping and Waterways, Sarbananda Sonowal. It had been pending for quite a few years. A PIB note of June 2025 calls it a 10-year agreement that gives India the legal rights to operate the port
Equipment	A contract for six mobile harbour cranes worth over USD 25 million; the first two, of 140 tonnes lifting capacity each, were unloaded at Chabahar on 18 January 2021. Under the 2024 contract India committed USD 120 million for port equipment
Credit window	DD News, the public broadcaster, reported on 13 May 2024 that India had offered a rupee credit window equivalent to USD 250 million for infrastructure projects. This is a credit offer, not the equipment commitment

Two points of care. On 13 May 2024 Sonowal also met Iran's Minister of Roads and Urban Development, Mehrdad Bazrpash; but the contract itself was signed by IPGL and the PMO, not by the Ministry. And the PTI report of the same day said IPGL would invest about USD 120 million; that is the same figure as the equipment commitment, not an extra amount.

2.5 Operations and cargo

- **Takeover:** India took over the operations of a part of Shahid Beheshti port at a meeting under the Chabahar trilateral agreement (India, Iran and Afghanistan) on 24 December 2018. The handover of the terminal, the cargo equipment and the office building was complete by 29 December 2018.
- **First ship:** the bulk carrier MV Macheras (registered in Cyprus) berthed on 30 December 2018 with about 72,458 tonnes of corn from Brazil. The Ministry called this the first time India would operate a port outside its territory.
- **Capacity (Ministry, July 2022):** 8.5 million tonnes a year then; to be raised to 15 million tonnes when Phase I is complete.
- **Cargo handled:** the official releases used here give no total. The PTI report of 13 May 2024 gave more than 90,000 TEUs (twenty-foot equivalent units, the standard container measure) of container traffic and more than 8.4 million tonnes of bulk and general cargo.
- **Humanitarian use:** the same report said wheat and pulses sent by India to Afghanistan were transhipped at the port.

2.6 The linked corridors

Corridor or agreement	Who	What it does	Date and India's part
Trilateral transit agreement	India, Iran and Afghanistan	Sets up an International Transport and Transit Corridor through Chabahar (PTI)	Signed during the Prime Minister's visit to Iran on 23 May 2016
Chabahar-Zahedan rail line	IRCON (India) and CDTIC (Construction, Development of Transport Infrastructure Company of Iran)	A rail line from Chabahar to Zahedan in Iran	MoU signed on 23 May 2016. In the Joint Statement of 17 February 2018 India conveyed its readiness to support the line
International North-South Transport Corridor (INSTC)	Begun by India, Iran and Russia; founding parties distinguished from the later membership	A multimodal (ship, rail and road) route from India through Iran to Russia and the Caspian region. The Ministry says the 2024 contract is an important step in opening up the INSTC to Central Asia	The agreement was signed in September 2000 by the transport ministers of India, Russia and Iran, and was to take effect when all three had ratified it (Lok Sabha answer, 23 November 2000)

Corridor or agreement	Who	What it does	Date and India's part
Ashgabat Agreement	Signed on 25 April 2011 by Iran, Oman, Qatar, Turkmenistan and Uzbekistan; Qatar later withdrew	An international transport and transit corridor between Central Asia and the Persian Gulf	India joined with effect from 3 February 2018, after the four founding members consented (MEA, February 2018)

The INSTC dry run of 2014. The fifth meeting of the INSTC Coordination Council, at Baku in Azerbaijan in 2013, recommended a dry run (a trial shipment). The Federation of Freight Forwarders' Associations in India ran it in 2014 on two routes, says a reply of the Commerce Ministry in the Lok Sabha (20 March 2015):

1. Nhava Sheva (Mumbai) to Bandar Abbas (Iran), then to Tehran and Bandar Anzali (Iran), and on to Astrakhan (Russia).
2. Nhava Sheva to Bandar Abbas, and on to Baku (Azerbaijan).

Note that both trial routes entered Iran at Bandar Abbas, not at Chabahar.

2.7 Why Chabahar matters, and what holds it back

Why it matters

- **Access:** the Ministry (13 May 2024) stresses access to Afghanistan and Central Asia. The route runs through Iran, so it does not pass through Pakistan; guidebooks state this as "bypassing Pakistan".
- **INSTC:** the Ministry calls Chabahar a vital nodal point for the INSTC network.
- **Trade and connectivity:** the two governments spoke in May 2024 of making Chabahar a regional connectivity hub; the Ministry calls it an India-Iran flagship project.
- **Aid:** wheat and pulses for Afghanistan went through the port (PTI, 2024).
- India's wider foreign policy, under which such connectivity projects fall, is taught in Topic 173.

What holds it back

- **Sanctions risk:** changing rules can affect operators, financing and insurance. Verify the applicable official instrument and date; do not treat a historical exception as a current blanket exemption.
- **Regional security:** conflict can disrupt shipping and inland movement; this is a risk mechanism, not a claim about a particular current incident.
- **Finance:** a commitment, credit offer, allocation, payment and utilisation are different stages. One does not automatically prove another.
- **Rail link:** beyond the MoU of 2016 and India's readiness to support it (2018), the official sources used here give no later progress on the Chabahar-Zahedan line, so do not accept a claim that it is complete.

- **Afghanistan:** the transit agreement and humanitarian objectives must be distinguished from the separate legal scope of any sanctions exception.

3. Extra section: chronology of the Chabahar project

Date	What happened
2003	India's engagement with Iran on the port begins
May 2015	India-Iran MoU on the port
23 May 2016	Prime Minister's visit to Iran: bilateral contract on the port (Phase I, USD 85 million); trilateral transit agreement with Afghanistan; IRCON-CDTIC MoU on the Chabahar-Zahedan rail line
3 February 2018	India joins the Ashgabat Agreement
February 2018	Interim arrangement for operations; Joint Statement of 17 February 2018 on readiness to support the rail line
6 May 2018	Short-term contract
24 December 2018	IPGCFZ takes over the interim operation of a part of Shahid Beheshti port
30 December 2018	First ship handled: MV Macheras, with corn from Brazil
18 January 2021	First two of six mobile harbour cranes unloaded
13 May 2024	Long-term main contract between IPGL and the PMO

4. Three common exam traps

1. **Contract and sanctions permission are different.** The 2024 terminal contract is not proof that every later sanctions restriction is waived. Read the date, duration and scope of each official instrument separately.
2. **Three agreements, three sets of members.** The trilateral transit agreement of 2016 is India, Iran and Afghanistan. The INSTC was begun by India, Iran and Russia. The Ashgabat Agreement was signed by Iran, Oman, Qatar, Turkmenistan and Uzbekistan, and India joined it later, in 2018. Afghanistan is not a founder of the INSTC, and Russia is not in the trilateral agreement.
3. **Capacity is not cargo handled, and a target is not a capacity.** In 2022 the Ministry gave the port's capacity as 8.5 million tonnes, to rise to 15 million tonnes when Phase I is complete. The "more than 8.4 million tonnes" of 2024 is a news report of bulk and general cargo actually handled. The two figures are close but measure different things.

7. Sources

7.1 Sources

No.	Source	Used for
S1	Press Information Bureau (Ministry of Shipping, now Ports, Shipping and Waterways), “India takes over operations of part of Chabahar Port in Iran”, 7 January 2019, Release ID 1558896. https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1558896	Takeover at the trilateral meeting of 24 December 2018; handover complete by 29 December 2018; IPGCFZ office opened by India, Iran and Afghanistan; first ship MV Macheras, 30 December 2018, about 72,458 tonnes of corn from Brazil; engagement since 2003; MoU of May 2015; 10-year contract of 23 May 2016; interim arrangement of February 2018; short-term contract of 6 May 2018; first port operated by India outside its territory
S2	Press Information Bureau (Ministry of Shipping), “Chabahar Port”, reply in the Lok Sabha, 3 January 2019, Release ID 1558480. https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1558480	IPGCFZ as the SPV of IPGL in Iran; interim operation with effect from 24 December 2018; IRCON-CDTIC MoU on the Chabahar-Zahedan rail line during the Prime Minister’s visit to Iran on 23 May 2016; Joint Statement of 17 February 2018 on readiness to support the line
S3	Press Information Bureau (Ministry of Ports, Shipping and Waterways), “Government of India strengthens cargo handling capacity of Chabahar Port, Iran”, 18 January 2021, Release ID 1689673. https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=1689673&reg=3&lang=2	Two mobile harbour cranes of 140 tonnes unloaded on 18 January 2021; contract for six cranes worth over USD 25 million; bilateral contract of 23 May 2016 worth USD 85 million (Phase I); IPGL as a Mumbai-based SPV set up under the Ministry
S4	Press Information Bureau (Ministry of Ports, Shipping and Waterways), “India to work towards unlocking trade potential with Central Asia through Chabahar Port: Union Shipping Minister”, 31 July 2022, Release ID 1846762. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1846762&reg=48&lang=2	Chabahar as the commercial transit centre for the region, especially Central Asia; capacity of 8.5 million tonnes, to be 15 million tonnes after Phase I

No.	Source	Used for
S5	Press Information Bureau (Ministry of Ports, Shipping and Waterways), "Long-term Main Contract for development of Shahid Beheshti Port Terminal, Chabahar signed between India Port Global Limited (IPGL) and Ports and Maritime Organization (PMO) of Iran", 13 May 2024, Release ID 2020454. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2020454&reg=48&lang=2	Date and parties of the long-term main contract; Sonowal's presence; meeting with Minister Mehrdad Bazrpash; regional connectivity hub; gateway for Afghanistan and Central Asia; India-Iran flagship project
S6	Press Information Bureau, "Year End Review of Ministry of Ports, Shipping and Waterways 2024", 31 December 2024, Release ID 2089049. https://www.pib.gov.in/PressReleasePage.aspx?PRID=2089049&reg=48&lang=2	Contract pending for quite a few years; an important step in opening up the INSTC to Central Asia
S7	Press Information Bureau, "Transforming India's Transport Infrastructure (2014-2025)", 11 June 2025, Note ID 154624. https://www.pib.gov.in/PressNoteDetails.aspx?ModuleId=3&NoteId=154624&reg=3&lang=2	10-year agreement of 2024 giving India the legal rights to operate the port; vital nodal point for the INSTC network
S13	Deccan Herald (PTI), "India, Iran sign pact for long-term operation of terminal at Chabahar", 13 May 2024. https://www.deccanherald.com/amp/story/india%2Findia-iran-sign-pact-for-long-term-operation-of-terminal-at-chabahar-3020456	10-year term; IPGL to invest about USD 120 million; rupee credit window equivalent to USD 250 million; trilateral agreement of May 2016 for an International Transport and Transit Corridor; cargo handled (more than 90,000 TEUs and more than 8.4 million tonnes); wheat and pulses for Afghanistan
S17	Ministry of Commerce and Industry, "Dry Run Study of INSTC Trade Route", reply in the Lok Sabha, 20 March 2015, as reproduced by Business Standard. http://www.business-standard.com/article/government-press-release/dry-run-study-of-instc-trade-route-115032000589_1.html	Fifth INSTC Coordination Council meeting at Baku (2013); dry run of 2014 by the freight forwarders' federation; the two routes

No.	Source	Used for
S18	The institute's current affairs file: Insights "Current Affairs 30", February 2026, "Chabahar Port", page 64	Selection of the item only. The facts in the notes are taken from the sources listed in this table
S19	Lok Sabha, Unstarred Question No. 3984, Ministry of Commerce and Industry, answered on 20 March 2015 (Digital Parliament Library). https://eparlib.nic.in/bitstream/123456789/660907/1/15450.pdf	Official text of the dry-run reply: fifth Coordination Council meeting at Baku (2013); dry run in 2014; the two routes through Bandar Abbas to Astrakhan and to Baku
S20	Lok Sabha, Unstarred Question No. 803, Ministry of Shipping, answered on 23 November 2000 (Digital Parliament Library). https://eparlib.nic.in/bitstream/123456789/396916/1/14494.pdf	INSTC agreement signed in September 2000 by the transport ministers of India, Russia and Iran; to take effect after ratification by all three
S22	Manohar Parrikar Institute for Defence Studies and Analyses (IDSA), "Significance of India joining the Ashgabat Agreement". https://www.idsa.in/publisher/comments/significance-of-india-joining-the-ashgabat-agreement/	Signed on 25 April 2011 by Uzbekistan, Turkmenistan, Iran, Oman and Qatar; Qatar withdrew in 2013; Turkmenistan as depository informed India on 1 February 2018

Additional verified primary sources — 31 October 2026

- PIB, 26 July 2024, PRID2037450: ten-year equipping/operating term from13May2024; 2023–24 vessel traffic+43%, container traffic+34%. These are distinct historical indicators, not 2026growth rates. https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=2037450&lang=2&reg=48
- DD News,13May2024: approximatelyUSD120million equipment commitment and separate rupee credit window equivalent toUSD250million. Offered credit is not proof of disbursement. https://ddnews.gov.in/en/india-and-iran-ink-long-term-deal-for-chabahar-port-operations/
- Actual official LokSabha reply3984,20March2015,page1 verifies both dry-run routes and Baku2013 recommendation. https://eparlib.sansad.in/bitstream/123456789/660907/1/15450.pdf
- Embassy of India,Astana,16February2018newsletter,page5: accession effective3February2018; four consenting founding members named Iran,Oman,Turkmenistan,Uzbekistan; Turkmenistan depository. This dated formulation is used in the visual, not an independently certified current roster. Embassy newsletter, 16 February 2018, page 5