INDEPENDENT CAT PREPARATION / ORIGINAL MOCK

CAT 2026 Prediction Paper 01

Question paper

68 questions · 120 minutes · Maximum 204 marks

This is an original practice paper informed by recent CAT patterns and the forecast in this study. It is not the official CAT 2026 paper and does not claim to reproduce unreleased questions. Its difficulty has not been calibrated on a candidate cohort.

SECTION	QUESTIONS	TIME	MARKS
Verbal Ability & Reading Comprehension	24	40 minutes	72
Data Interpretation & Logical Reasoning	22	40 minutes	66
Quantitative Ability	22	40 minutes	66

Correct answer: +3. Incorrect MCQ: –1. Incorrect TITA or unanswered question: 0. Each MCQ has exactly one correct option. TITA answers are whole numbers.

Design reference: IMS CAT 2025 exam analysis and the instructions of the official CAT 2026 mock (released 6 November 2026). The 24/22/22 structure, four-question RC passages and four- or five-question DILR sets inform this mock. Original contexts and exact question allocations are authoring choices. Method and source limitations: validation.html. Practice profile: The original forecast.

VARC · 24 questions

RC 1 · What an archive allows us to see

Historians are sometimes told that digitisation will finally free them from the prejudices of the archive. Once millions of documents become searchable, the argument runs, the eccentric interests of earlier collectors will matter less: patterns invisible to an individual reader will emerge from the aggregate. This promise confuses two different obstacles. A researcher may previously have been unable to locate an existing record; alternatively, the activity being studied may never have generated a record that an institution considered worth keeping. Search can radically reduce the first difficulty without touching the second.

Consider a municipal archive that preserves licences issued to street traders. A digital count might suggest that women's participation in street commerce rose sharply after a particular year. Yet the change could reflect a new rule requiring family assistants, many of them women, to obtain separate licences. The archive would then register the expansion of an administrative category rather than the beginning of an economic activity. More data from the same series might make the apparent trend look increasingly precise while leaving its interpretation wrong. Precision describes the stability of a measurement; it does not certify that the measurement answers the intended question.

This does not make official records useless or imply that every silence conceals the same excluded population. Both conclusions would turn a warning about evidence into permission to invent it. The historian needs to investigate how documents were produced: who had to report, what reporting cost, which conduct attracted enforcement, and what happened to records after collection. A gap becomes informative only in relation to a plausible process that could have produced it. Even then, an account of that process establishes possibilities and limits; it does not automatically supply the missing voices.

Other sources can help, but they do not stand outside these problems. Oral testimony has its own occasions and audiences; a household account book selects what its keeper found significant. Their value lies partly in their different selection mechanisms. When sources generated under different incentives converge, confidence may increase. When they disagree, the disagreement can expose the institutional work that a seemingly neutral category performed. Combining sources is therefore not simply a matter of filling empty cells in an otherwise settled table.

The best digital archive would make its own conditions of visibility easier to inspect. Alongside searchable documents, it would describe changes in collection rules, classification systems and survival rates, including what remains unknown. Such features may yield fewer immediate answers than an attractive graph, but they enable better questions. Scale can enlarge the historian's field of vision; understanding how that field was constructed keeps enlargement from being mistaken for completeness.

V01. Which statement best captures the central argument of the passage? MCQ

A. Digital archives should prioritise records of excluded groups because administrative sources primarily document official prejudice.
B. Combining official records with personal testimony enables historians to reconstruct a complete account that either source would conceal.
C. The biases of institutional record keeping make large numerical studies less reliable than close readings of individual documents.
D. Digitisation strengthens historical inquiry when greater access is accompanied by scrutiny of how the surviving evidence was produced and selected.

V02. Which finding would most directly support an interpretation analogous to the passage's alternative explanation of the rise in women's trading licences? MCQ

A. Hospital admissions rose after a factory opened, and independent household surveys recorded a simultaneous rise in respiratory illness.
B. The number of registered tenants rose abruptly when an unchanged tenant population became subject to individual rather than household registration.
C. Digitised shipping registers revealed more vessels than a historian had found by manually sampling the same registers.
D. Letters describing an unrecorded protest survived in a family collection, although municipal files contained no mention of it.

V03. The author would be most likely to agree with which statement about an absence in an archive? MCQ

A. An absence can constrain or inform interpretation when connected to a defensible account of record production, without revealing its missing contents.
B. Once a discriminatory reporting rule is identified, a historian can infer the scale of the activity excluded by that rule.
C. An absence is historically meaningful only when another source supplies the exact information that is missing.
D. An absence should be treated as evidence of institutional exclusion unless the historian can establish accidental document loss.

V04. What purpose does the discussion of oral testimony and household account books primarily serve? MCQ

A. It establishes that personal sources are less affected by institutional interests than official records.
B. It extends the need to examine selection beyond official records and shows how differently generated evidence can improve interpretation.
C. It shifts the argument from the reliability of sources to the superior interpretive skills of historians who use several media.
D. It explains why disagreement between sources should normally be resolved in favour of the source with fewer reporting costs.

RC 2 · The city after dark

Cities usually describe artificial light as a quantity to be supplied. A street is inadequately lit; a junction needs brighter lamps; a square has been successfully illuminated. This vocabulary makes darkness look like a leftover, what remains wherever a service has not yet arrived. For many urban organisms, however, darkness is itself a condition that infrastructure either preserves or destroys. A river can remain physically continuous while becoming difficult for a nocturnal animal to traverse because a sequence of lights interrupts its route.

The issue is not adequately captured by counting bulbs or adding up their electricity use. A lamp that consumes less energy can emit light that has a greater effect on a particular species. Direction, wavelength and timing matter alongside intensity. Nor do all species respond alike. An illuminated feeding site may benefit one predator while exposing another animal to danger. Consequently, the discovery of more animals around a lamp is not, on its own, evidence that the lamp has improved the habitat. The observed gathering may even depend on a depletion elsewhere.

Thinking in terms of temporal habitat changes the questions asked of a lighting plan. Instead of asking only whether a riverside path is bright enough throughout the night, planners might ask who uses which segments, at what hours, and during which seasons. Lighting a crossing during the evening commute and shielding a neighbouring riverbank after midnight are not logically incompatible objectives. A useful plan could make room for both, although deciding how much room requires local evidence and public deliberation. Darkness need not mean that every light is switched off simultaneously.

There is nevertheless a danger in treating adjustable technology as an automatic reconciliation of competing needs. Motion sensors may illuminate a path whenever a person arrives, but frequent activation can erase the very dark intervals that a species requires. A system can therefore satisfy its engineering specification and fail its ecological purpose. The relevant test is not whether the sensor works; it is whether the resulting pattern of light and darkness supports the activity for which a dark interval was intended. Testing that proposition requires observation beyond the boundaries of the installed equipment.

Human requirements are also uneven. People who work late, walk slowly or depend on an unfamiliar route may experience a lighting reduction differently from an able resident returning early to a familiar home. Their concerns cannot be dismissed by invoking nature as a single overriding interest. The case for temporal habitat is instead a case for making neglected consequences visible within a shared decision. Its ambition is neither the permanently bright city nor the uniformly dark one, but a city capable of asking what a particular light does, for whom, and at what time.

V05. Which proposal is most consistent with the passage as a whole? MCQ

A. Set a single maximum illumination level for every street, since ecological harm is chiefly a result of excessive brightness.
B. Plan and assess lighting through its changing effects on human and nonhuman activity, using local evidence and negotiated priorities.
C. Replace conventional lamps with efficient sensor-controlled lamps, since responsive equipment reconciles the principal competing needs.
D. Establish uninterrupted darkness as the default public entitlement and require late-night users to adapt their travel accordingly.

V06. Two riverbank lighting plans use identical lamps and provide the same total number of dark hours per night. One provides a continuous dark period; the other divides darkness into short intervals. A council observes the same nightly total of animal detections under both plans and concludes that their ecological effects are equivalent. Which assumption connecting its evidence to its conclusion is most directly called into question by the passage? MCQ

A. Identical lamps provide an appropriate control for differences in wavelength and direction between the plans.
B. Observing the plans over comparable nights reduces the risk of attributing seasonal population changes to lighting.
C. A plan can preserve an ecologically useful period of darkness without leaving the riverbank unlit for the whole night.
D. Ecologically important differences in the timing and continuity of darkness would be reflected in the nightly aggregate detection count.

V07. The distinction between meeting an "engineering specification" and achieving an "ecological purpose" implies that: MCQ

A. correct operation of a device is insufficient evidence of success when success depends on the environmental pattern produced by its use.
B. engineering specifications cannot incorporate ecological knowledge because devices and organisms operate on different timescales.
C. sensor-operated lighting is generally more ecologically damaging than permanently illuminated lighting.
D. an ecological purpose can be evaluated only after all artificial lighting has been removed from the study area.

V08. Which inference about "temporal habitat" is best supported by the passage? MCQ

A. It is relevant primarily where humans and wildlife use the same space at entirely different times.
B. It converts disagreements about lighting into technical questions that ecological monitoring can settle without value judgements.
C. It can reveal an interruption in a habitat that a map showing only the physical continuity of a river would miss.
D. It requires city planners to assign equal weight to every species affected by a proposed lighting change.

RC 3 · Where expertise comes from

A familiar defence of automation says that it removes routine tasks so that skilled workers can devote themselves to judgement. The claim is persuasive when routine work and judgement are independent activities, like carrying a suitcase and deciding where to travel. In many occupations they are not. What looks routine to an observer may be the repeated encounter through which a worker learns what ordinary conditions feel like, and therefore notices when a case is becoming unusual. Removing the encounters can remove part of the machinery that produces judgement.

An experienced technician may benefit greatly from a system that summarises hundreds of measurements. Years of inspecting the underlying records have already supplied a sense of plausible variation. A novice receiving the same summary does not inherit that history. Both may produce equally satisfactory decisions on ordinary days, especially when the system is reliable. Their apparent equivalence can disappear when a sensor deteriorates or an unfamiliar combination of conditions arises. Success with the tool is evidence about current performance, not necessarily about the knowledge available when the tool becomes misleading.

The distinction is between using a stock of expertise and maintaining the process by which that stock is renewed. Organisations often measure the former because speed, cost and immediate error rates are visible. The latter may be neglected precisely because accumulated expertise continues to support performance for several years after opportunities to acquire it have diminished. By the time the loss becomes apparent, experienced staff may have left and the remaining staff may have had little reason to practise independent interpretation. A productive arrangement can thus quietly consume an educational resource.

This argument does not require every worker to repeat every task that software can perform. Repetition without attention may teach little, and some manual procedures were poor teachers even before automation. The question is which encounters generate useful discrimination and how to preserve those encounters economically. A training system might occasionally withhold its recommendation until the learner records a diagnosis, then expose the evidence behind disagreements. Simulations of rare failures can help as well, provided that their cues do not make the intended lesson obvious. Training that rewards recognition of a familiar exercise can exaggerate preparedness for an unfamiliar event.

The proper comparison is therefore not between automation and an imagined past in which everyone understood everything. It is between alternative arrangements for producing reliable work and replenishing the understanding on which reliability depends. Some tools can support both: they may reveal patterns that were previously too costly to examine. But that educational effect is a design achievement, not a dividend that follows automatically from labour saved. A system that frees experts to exercise judgement must also leave a route by which someone can become an expert.

V09. Which statement best summarises the author's main argument? MCQ

A. Because routine work is the chief source of professional skill, organisations should retain manual procedures until all workers have become experts.
B. Automation is most valuable when its immediate productivity gains are used to fund longer periods of classroom instruction.
C. Automation should be evaluated and designed with attention to both current performance and the experiences through which expertise is renewed.
D. The reliability of automated systems depends chiefly on recruiting experienced workers who can identify unusual situations.

V10. An organisation introduces automation, after which routine performance remains strong. A critic argues that this success may conceal a weakening of the process by which new workers acquire independent judgement. Which finding would most directly weaken that specific concern about this organisation? MCQ

A. New workers match earlier recruits on independent tests using the same failure scenarios that both groups practised during training.
B. New workers and experienced workers give equally accurate answers to unfamiliar cases when the automated recommendation is available.
C. Experienced workers retain their earlier level of unaided accuracy on unfamiliar cases after several years of using the automated system.
D. After the same training period, new workers match comparable pre-automation recruits on unaided tests of unfamiliar cases in which familiar surface cues have been altered.

V11. Trainees diagnose cases before seeing an automated recommendation and then receive feedback. Their scores improve, but each practised failure has always appeared with a conspicuous visual cue. Which assessment would best distinguish improved discrimination of the underlying fault from recognition of that familiar cue? MCQ

A. Use additional cases with new numerical values but the same correspondence between the visual cue and the fault, requiring an unaided diagnosis.
B. Ask trainees to explain, after seeing the system's recommendation, which features of a familiar case support that recommendation.
C. Require evidence-based diagnoses before advice on cases where the familiar cue appears without the fault and where the fault appears without the cue.
D. Compare the speed and confidence of unaided diagnoses on familiar cases before and after the training programme.

V12. Which assumption in the familiar defence of automation does the opening paragraph most directly challenge? MCQ

A. Removing routine activity leaves intact the processes that develop and sustain the judgement workers are expected to exercise.
B. Automated systems can sometimes execute routine tasks more efficiently than people.
C. Professional judgement can be improved through repeated encounters with cases.
D. Skilled workers prefer exercising judgement to performing repetitive tasks.

RC 4 · Making repair ordinary

Arguments for a right to repair often begin with a simple contrast: an object that can be opened, understood and mended gives its owner more control than one sealed against intervention. This is a strong starting point, but a weak stopping point. A repairable design does not itself create a functioning repair economy. An owner also needs parts, diagnostic information, suitable tools and someone with the time or ability to use them. The difference between a repair that is technically possible and one that is practically available can be considerable.

Take a washing machine whose pump is attached with ordinary screws. If the only replacement pump is withdrawn three years after sale, accessible screws offer limited consolation. Conversely, stocking every component indefinitely imposes costs, and some unused parts will eventually become waste. The problem is not solved by declaring either manufacturers or consumers uniquely irresponsible. It involves a coordination question: who should bear the cost of keeping future repair possible when the timing and volume of demand are uncertain? Standards, commitments about availability and pooled inventories offer different answers, each with trade-offs.

Information creates a related difficulty. A fault code can make diagnosis quick, but only if its meaning is available to the person attempting the repair. Releasing a manual once may be insufficient if later software changes how a component operates. Access has a duration as well as a moment of delivery. This is why repair should be understood as a relationship that can extend across an object's working life, rather than as a property settled completely at the factory gate. The relationship need not be monopolised by the original seller; independent workshops and user communities can sustain important parts of it.

Environmental claims require similar care. Keeping a product in service avoids some impacts associated with producing a replacement, but repair is not environmentally preferable under every conceivable condition. An exceptionally inefficient old appliance may consume enough additional resources to change the comparison. That possibility does not justify treating all older products as obsolete. It means that the relevant comparison includes production, use and likely remaining service, rather than celebrating either longevity or novelty in isolation. A policy can make repair available while allowing informed decisions about when to use it.

Community repair events illustrate both the promise and the limits of voluntary action. They can circulate practical knowledge and recover objects that would otherwise be discarded. They cannot reliably compensate for components that no one can obtain or information withheld from everyone outside an authorised network. Celebrating the ingenious volunteer while ignoring those constraints risks converting a systemic obstacle into an individual test of resourcefulness. The right to repair becomes substantial when the conditions for ordinary, repeatable repair are secured, so that success does not depend on finding an unusually determined person.

V13. Which statement most accurately expresses the passage's central claim? MCQ

A. A meaningful right to repair requires sustained practical conditions for repair, extending beyond a product's physically accessible design.
B. Repair policy should primarily transfer responsibility for spare parts from manufacturers to independent workshops and user communities.
C. The environmental value of repair is uncertain enough that governments should focus on improving the efficiency of new products instead.
D. Voluntary repair communities offer the most economical way to overcome manufacturers' reluctance to keep old products working.

V14. Two appliance models are equally easy to open, and both came with diagnostic manuals. Five years later, a smaller proportion of attempted repairs succeeds for one model. A reviewer attributes the difference to its owners being less resourceful. Which investigation would best test the alternative explanation suggested by the passage? MCQ

A. Compare owners' reported repair experience and willingness to spend time on repairs, matching them by the original purchase price.
B. For comparable faults and access to skilled labour, compare whether compatible parts and usable, updated instructions were obtainable when each repair was attempted.
C. Have technicians compare disassembly times and the clarity of the manuals originally supplied, without consulting later parts or software records.
D. Compare the models' expected remaining service and energy use to establish whether the failed repairs would have been environmentally worthwhile.

V15. Which statement about environmental policy would the author most likely endorse? MCQ

A. If repair is technically possible, extending an appliance's life is environmentally preferable to purchasing a replacement.
B. Policy should preserve a practical repair option while allowing the choice to depend on production impacts, use impacts and expected remaining service.
C. Because old appliances may be inefficient, practical access to repair should depend on proof that repair has the lower total environmental impact.
D. Replacement should be preferred whenever a new appliance has lower energy consumption during use, regardless of its production impacts.

V16. The discussion of the "unusually determined person" primarily serves to: MCQ

A. suggest that repair enthusiasts exaggerate the difficulty of tasks that ordinary consumers could perform with enough effort.
B. argue that professional repair services should replace voluntary community initiatives.
C. warn that exceptional individual successes can distract from whether the wider conditions for routine repair are available.
D. show that personal attachment to objects is more important to successful repair than technical information.

V17. Choose the option that best summarises the paragraph.

Public consultation is often judged by how many people participate. Yet an invitation to comment may arrive after the consequential choices have been fixed, leaving participants to choose a colour for a building whose location they oppose. Low participation can therefore express a realistic assessment of influence rather than civic indifference. Equally, a crowded meeting need not show that influence is substantial: the disputed decision may simply matter enough for people to attend despite expecting little effect. Participation figures become interpretable only when related to what participants could change and whether reasons offered in discussion altered the decision process. Counting voices is useful, but it cannot substitute for examining the power attached to them. MCQ

A. Participation in consultation increases when citizens believe their contributions will influence major decisions rather than cosmetic details.
B. Public consultation is meaningful only if participants have the authority to reverse decisions made before their involvement.
C. Participation counts alone cannot establish the quality of consultation; they must be interpreted alongside participants' opportunities for influence and the treatment of their reasons.
D. Low attendance often reflects citizens' limited influence, whereas high attendance establishes that the issue matters more than the consultation process.

V18. Choose the option that best summarises the paragraph.

A translation can reproduce every explicit claim in a text and still alter what the text asks its reader to do. A joke may depend on a delay before a familiar expression becomes strange; a political slogan may derive force from sounding borrowed rather than new. Moving these effects into another language sometimes requires changing the wording that appears most faithful in isolation. This does not grant translators unlimited licence. The change should be defensible in relation to the text's activity and the new reader's resources. Fidelity is consequently neither a fixed distance from the original wording nor permission to create an independent work; it is an accountable judgement about which relations must survive the move. MCQ

A. A faithful translation reproduces explicit claims while allowing translators to devise new effects suited to the receiving culture.
B. The effects of jokes and slogans cannot survive literal translation because different languages supply readers with incompatible cultural resources.
C. Translators should give priority to readers' reactions over explicit claims whenever the two cannot be preserved simultaneously.
D. Faithful translation may require justified changes in wording to preserve how a text operates for readers, without becoming unrestricted reinvention.

V19. The sentence below is missing from the paragraph. Choose the position (1), (2), (3) or (4) where it best fits.

Missing sentence: The missing entry is the time between planting those saplings and their becoming effective sources of shade.

Paragraph:
(1) City tree inventories often report gains and losses as a count of individual trees. On that measure, replacing ten mature trees with ten newly planted saplings appears to restore what was removed. (2) During that unrecorded interval, residents may lose protection from summer heat even though the inventory shows a balanced total. A numerical recovery can therefore conceal a prolonged reduction in a service that people actually use. (3) This does not make counting trees pointless; counts remain useful for tracking planting activity and checking whether promised replacements arrived. It means that evaluating the consequences of replacement also requires measures that register the age and development of the trees. (4) MCQ

A. Position (1)
B. Position (2)
C. Position (3)
D. Position (4)

V20. The sentence below is missing from the paragraph. Choose the position (1), (2), (3) or (4) where it best fits.

Missing sentence: The second kind of disagreement can expose a difference in what the teams have actually chosen to measure.

Paragraph:
(1) When studies report incompatible numbers, the disagreement may be presented as a contest in which one team must have made a mistake. Before choosing a winner, however, it helps to distinguish two situations. (2) Teams may obtain different results while applying the same measurement rules to comparable cases. Alternatively, they may use different rules while describing their measurements with the same familiar label. (3) Such a difference can remain hidden if discussion focuses exclusively on whether each team calculated its result correctly. Recognising it changes the task from identifying a computational error to examining the relation between a label and the procedures that give it meaning. (4) MCQ

A. Position (1)
B. Position (2)
C. Position (3)
D. Position (4)

V21. The four sentences below form a coherent paragraph when arranged correctly. Enter the correct sequence of sentence numbers without spaces.

1. The unresolved descriptions constitute what might be called interpretive debt, which remains after the files themselves are accessible.
2. A museum can digitise every object in a collection within a few months.
3. Paying down that debt requires revisiting earlier curatorial judgements, so it cannot be measured by the number of files uploaded.
4. Its catalogue, however, may take years to replace obsolete descriptions inherited from earlier curators. TITA

V22. The four sentences below form a coherent paragraph when arranged correctly. Enter the correct sequence of sentence numbers without spaces.

1. At first, the resulting difference in germination seemed to demonstrate the superiority of one soil.
2. That overlooked difference meant that the trial could not isolate soil as the cause of the result.
3. To compare two soils, a gardener planted one batch of seeds in each and kept watering and sunlight the same.
4. Yet the seeds assigned to the two soils had also been stored at different temperatures before planting. TITA

V23. Four of the five sentences below form a coherent paragraph. Enter the number of the sentence that does not belong.

1. A flood warning can lower the loss from a storm if it prompts residents to move valuables upstairs.
2. The resulting low loss does not, by itself, show that the warning exaggerated the danger.
3. Weather agencies often express rainfall forecasts as the probability of exceeding a specified amount.
4. Indeed, judging the warning by the damage actually observed can penalise it for inducing successful precautions.
5. Its value must therefore be assessed against an estimate of what would have happened without those precautions. TITA

V24. Four of the five sentences below form a coherent paragraph. Enter the number of the sentence that does not belong.

1. For that reason, a model can lose accuracy even when the physical objects it encounters have not changed.
2. A classification system inherits the distinctions made by the people who labelled its training examples.
3. When those people revise a category boundary, yesterday's correctly labelled example may no longer carry the accepted label.
4. Faster processors allow classification systems to inspect larger collections of images in a given time.
5. Maintaining accuracy therefore requires checking whether category definitions, as well as the objects being classified, have changed. TITA

DILR · 22 questions

Subscription audit

SET 1 — Subscription audit

A learning platform sells three monthly plans: Basic at ₹100, Standard at ₹150 and Premium at ₹250. Each subscriber buys exactly one plan. The following table gives the number of subscribers and the revenue collected in four cities in one month. There are no discounts, taxes or refunds in this original snapshot.

City	Total subscribers	Revenue (₹)
A	180	27,000
B	180	27,000
C	200	31,000
D	200	33,000

Additional information:
• Premium subscribers in A and B are in the ratio 4:3.
• Basic subscribers in C and A are in the ratio 5:4.
• Standard subscribers in A and C are in the ratio 3:2.
• There are 180 Premium subscribers across the four cities together.

All subscriber counts are whole numbers. Any change described in a question applies only to that question and starts from the original snapshot.

D01. How many Standard subscribers are there in city B? TITA

D02. Across all four cities, what is the total number of subscribers who are on either the Basic plan or the Premium plan? MCQ

A. 420
B. 440
C. 460
D. 480

D03. Some Standard subscribers move from city D to city B, retaining their plan. No other subscriber count changes. The proportion of Standard subscribers becomes the same in B and D. How many subscribers moved? TITA

D04. In city A, 10% of Basic subscribers, 20% of Standard subscribers and 25% of Premium subscribers receive a full refund. Everyone else receives no refund. What revenue, in rupees, does the platform retain from city A? MCQ

A. 21,400
B. 21,900
C. 22,400
D. 23,000

D05. The Basic price increases by 10%, the Standard price by 20%, and the Premium price remains unchanged. Subscriber counts do not change. Which city has the greatest percentage increase in revenue? MCQ

A. A
B. B
C. C
D. D

The eight-workshop programme

SET 2 — The eight-workshop programme

Eight workshops, A through H, occupy eight sessions from Monday through Thursday, with one morning and one evening session each day. Exactly one workshop occupies each session, and every workshop occurs once.

The workstreams are:
Analytics: A and E
Finance: B and F
Marketing: C and G
Operations: D and H

The programme satisfies all these conditions:
• The two workshops from the same workstream are never on the same day.
• A is in a morning session. A and F are on the same day.
• H is in an evening session.
• G is in the same session of the day as C, on the day immediately after C.
• E occupies the session immediately after B in chronological order. This may be the evening of the same day or the morning of the next day.
• D occurs later than G.

For questions asking for a session number, Monday morning is 1, Monday evening is 2, Tuesday morning is 3, and so on through Thursday evening, which is 8. Additional conditions in different questions are independent.

D06. How many complete programmes satisfy all the conditions? TITA

D07. Which statement must be true? MCQ

A. B is in a morning session.
B. E is in an evening session.
C. G is on Thursday.
D. C is in a morning session.

D08. If E is on Thursday morning, what is the session number of H? TITA

D09. If A is on Monday, how many distinct sessions can B occupy across all valid programmes? TITA

D10. Which ordered pair can occupy Wednesday morning and Wednesday evening, respectively? MCQ

A. G and H
B. E and D
C. A and D
D. D and G

The five-team league

SET 3 — The five-team league

Teams A, B, C, D and E play a single round-robin league: every pair meets exactly once. A win earns 3 points, a draw earns 1 point for each team and a loss earns 0 points. There are no penalties, bonus points or abandoned games in the original league.

The final points table is:
Team | Points
A | 8
B | 7
C | 5
D | 4
E | 2

It is also known that A drew with B, and C defeated D. Rankings are determined by points in descending

order. Changes in a question apply only to that question; the original table determines any reference to an opponent finishing higher.

D11. How many games in the league ended in a draw? TITA

D12. In which listed game did the first-named team defeat the second-named team? MCQ

A. A against C
B. B against D
C. D against B
D. E against C

D13. After the league, each team receives 2 additional points for each victory against a team that finished higher in the original table. By how many points does D's adjusted total exceed C's adjusted total? TITA

D14. Suppose the result of the B–D game alone were reversed, with its original loser becoming the winner. What would the final ranking be, from highest points to lowest? MCQ

A. B, A, C, E, D
B. A, B, C, E, D
C. B, A, C, D, E
D. A, C, B, D, E

Packing the relief consignment

SET 4 — Packing the relief consignment

A relief agency must pack exactly 100 cartons, containing a total of 250 kg of rice and 150 kg of pulses. It can use four standard carton types. Every carton contains 4 kg in total, and its contents cannot be changed.

Type	Rice (kg)	Pulses (kg)	Packing cost per carton (₹)
A	3	1	40
B	2	2	50
C	1	3	35
D	4	0	60

The number of A cartons is exactly twice the number of C cartons. At most 40 A cartons and at most 50 B cartons can be packed. At least 12 C cartons and at least 15 D cartons must be packed. All carton counts are non-negative integers.

In addition to the per-carton packing costs, there is one fixed surcharge of ₹500 if fewer than 18 D cartons are packed; there is no surcharge otherwise. The packing cost in every question includes this surcharge wherever applicable. Any subsidy mentioned in a question applies only to that question.

D15. How many distinct feasible allocations of carton counts are possible? Two allocations differ only if the count of at least one carton type differs. TITA

D16. If the agency insists on avoiding the ₹500 surcharge, what is the smallest possible number of B cartons? MCQ

A. 25
B. 30
C. 35
D. 40

D17. What is the minimum possible packing cost, in rupees? TITA

D18. A donor now offers a subsidy of ₹20 for every C carton, but only if the consignment contains at least 18 C cartons. The surcharge rule remains unchanged. Which allocation minimises the agency's net cost after this subsidy? Counts below are in the order A, B, C, D. MCQ

A. 28, 40, 14, 18
B. 32, 35, 16, 17
C. 40, 25, 20, 15
D. 36, 30, 18, 16

Routing through two hubs

SET 5 — Routing through two hubs

A warehouse W must send exactly 100 crates through two intermediate hubs, A and B, to two destinations, C and D. Exactly 60 crates must reach C and exactly 40 must reach D. A crate travels along precisely one of these four routes: W–A–C, W–A–D, W–B–C or W–B–D. There are no losses, storage, return trips or transfers between A and B.

Each directed link has the following capacity and cost. A capacity is an upper limit, and the listed cost is charged per crate that uses that link.

Link | Capacity (crates) | Cost per crate (₹)
W→A | 60 | 1
W→B | 70 | 2

A→C	40	2
A→D	30	4
B→C	50	4
B→D	30	1

The number of crates on every link must be a non-negative multiple of 5. Total transportation cost is the sum of the costs incurred on all links. A routing pattern is specified only by the number of crates on each of the six links: interchanging individual crates does not create a different pattern. A changed capacity in a question applies only to that question.

D19. How many feasible routing patterns are possible? TITA

D20. What is the minimum possible total transportation cost? MCQ

A. ₹380
B. ₹390
C. ₹400
D. ₹410

D21. If the total transportation cost is exactly ₹400, how many crates travel on W→B? TITA

D22. The capacity of A→C is temporarily reduced from 40 crates to 25 crates. All other capacities, costs and delivery requirements remain unchanged. What is the new minimum total transportation cost? MCQ

A. ₹395
B. ₹410
C. ₹420
D. ₹425

QA · 22 questions

Q01. A shopkeeper buys 300 identical notebooks at the same cost per notebook and marks each 50% above cost. She sells 40% of the stock at a discount of 20% on the marked price. She then sells 75% of the remaining stock at a discount of 10% on the marked price, and sells all the rest at cost. What is her overall profit percentage? MCQ

A. 21.5%
B. 23.75%
C. 26.25%
D. 28.5%

Q02. A vessel contains 60 litres of a milk–water mixture in the ratio 3:2. A quantity of the well-mixed liquid is removed and replaced by the same volume of water. After mixing thoroughly, 15 litres are removed and replaced by 15 litres of pure milk. The final milk–water ratio is 5:3. How many litres were removed in the first operation? TITA

Q03. The average score of 24 candidates is 65. Removing the four highest-scoring candidates reduces the average to 62. Removing the four lowest-scoring candidates from the original group instead raises the average to 69. What is the average score of the 16 candidates who are in neither of these two groups? MCQ

A. 62.50
B. 65.00
C. 67.50
D. 66.25

Q04. On one day, a motorboat covers 36 km downstream and 24 km upstream in a total of 6 hours. On another day, with the same speed in still water and the same current, it covers 24 km downstream and 36 km upstream in 6.5 hours. If the current subsequently doubles while the boat's speed in still water stays unchanged, how far can the boat travel upstream in 2.5 hours? Ignore turning time. MCQ

A. 15 km
B. 12 km
C. 18 km
D. 20 km

Q05. Working at constant individual rates, A and B together complete a job in 12 days, B and C in 15 days, and C and A in 20 days. On a fresh job, A and B work together for the first 4 days. A and C then work together for the next 8 days. C alone completes the remaining work. How many days elapse from the start until the job is finished? TITA

Q06. An investment earns 10% per year, compounded annually, for two years. Immediately after the second year's interest is credited, the investor withdraws ₹4,100. The remaining balance earns 20% during the third year and becomes ₹9,600. The withdrawn money is held without earning interest. What is the total gain after three years, expressed as a percentage of the original investment? MCQ

A. 31%
B. 35%
C. 37%
D. 41%

Q07. Vessels A and B each contain 60 litres. Initially their milk–water ratios are 2:1 and 1:2 respectively. One round consists of transferring x litres from A to B, mixing B thoroughly, and then transferring x litres from B back to A and mixing A thoroughly. Exactly two such rounds are performed using the same x, where $0 < x < 60$. The ratio of the quantities of milk finally in A and B is 13:11. What is x? MCQ

A. 10 litres
B. 20 litres
C. 15 litres
D. 30 litres

Q08. A manufacturer must prepare exactly 180 kg of a mixture containing 20% of an active ingredient by mass. Three supplies contain 10%, 25% and 40% of that ingredient and cost ₹40, ₹50 and ₹70 per kg respectively. They are sold only in sealed packs of 15 kg, 20 kg and 10 kg respectively. Every purchased pack must be used in full, and at most 80 kg of the 25% supply is available. What is the minimum total purchase cost, in rupees? TITA

Q09. Positive real numbers x and y satisfy $x + y = 6$ and $x^2 + y^2 = 20$. What is the value of $x^2/y + y^2/x$? MCQ

A. 9
B. 7
C. 8
D. 10

Q10. Find the sum of all real values of x for which $\log_2(x) + \log_x(16) = 5$. Here logarithms must be defined over the real numbers. TITA

Q11. How many integers x simultaneously satisfy $|x - 3| + |x - 8| \le 9$ and $[(x - 2)(x - 7)]/(x - 4) \le 0$? The rational expression must be defined. MCQ

A. 4
B. 6
C. 5
D. 7

Q12. For how many positive integers k does the equation $|x^2 - 6x + 5| = k|x - 3|$ have exactly three distinct positive real roots whose sum is less than 20? MCQ

A. 8
B. 10
C. 11
D. 9

Q13. For real $t \neq -2$, define $f(t) = (2t + 3)/(t + 2)$. If $f(f(f(x))) = 19/11$ and every intermediate expression is defined, find x. TITA

Q14. Positive real numbers x, y and z satisfy $x + y + z = 9$ and $xy + yz + zx = 24$. What is the largest possible value of xyz? MCQ

A. 20
B. 18
C. 24
D. 27

Q15. A triangular plot has side lengths 13 m, 14 m and 15 m. A circular pond is constructed inside it so that the pond's boundary touches all three sides. What is the radius of the pond? MCQ

A. 3 m
B. 4.5 m
C. 4 m
D. 6 m

Q16. ABCD is a convex trapezium with AB parallel to CD, AB = 12 cm and CD = 20 cm. Diagonals AC and BD intersect at O. What is the ratio of the combined areas of triangles AOB and COD to the combined areas of triangles AOD and BOC? MCQ

A. 8:7
B. 4:3
C. 16:15
D. 17:15

Q17. An isosceles triangle has base 16 cm and equal sides 17 cm. Two congruent circles lie entirely inside the triangle, one on each side of its axis of symmetry. Each circle touches the base and the nearer equal side, and the two circles touch one another. Find their common radius, in centimetres. TITA

Q18. Find the sum of all three-digit positive integers that leave a remainder of 3 when divided by 7, leave a remainder of 5 when divided by 11, and are divisible by 4. MCQ

A. 1,192
B. 1,500
C. 1,384
D. 1,808

Q19. Let N = 100!/(30! × 30! × 40!). Find the largest non-negative integer k for which 12^k is a divisor of N. TITA

Q20. Two lists contain the positive terms of the arithmetic progressions 3, 8, 13, 18, ... and 5, 12, 19, 26, ..., respectively. Each list stops before its first term greater than 500. How many numbers occur in both lists? MCQ

A. 12
B. 13
C. 14
D. 15

Q21. Six distinct students A, B, C, D, E and F stand in a row. A and B must not stand next to each other, E must not occupy either end, and C must stand somewhere to the left of D. How many arrangements are possible? TITA

Q22. A stationery shop sells pens at ₹15 each, pencils at ₹4 each and erasers at ₹3 each. Riya buys 20 items in all, at least one of each kind, and spends exactly ₹120. How many pens does she buy? MCQ

A. 4
B. 3
C. 5
D. 6