INDEPENDENT CAT PREPARATION / ORIGINAL MOCK

CAT 2026 Prediction Paper 02

Answer key & worked solutions

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: Build the baseline.

Quick answer key

V01 C	**V02** A	**V03** D	**V04** B	**V05** B	**V06** D
V07 A	**V08** C	**V09** D	**V10** B	**V11** C	**V12** A
V13 A	**V14** C	**V15** B	**V16** D	**V17** C	**V18** D
V19 A	**V20** B	**V21** 3124	**V22** 2413	**V23** 3	**V24** 3
D01 100	**D02** A	**D03** 5	**D04** B	**D05** C	**D06** 3
D07 B	**D08** 3	**D09** 1	**D10** A	**D11** 20	**D12** D
D13 20	**D14** A	**D15** 40	**D16** A	**D17** 20	**D18** B
D19 8	**D20** C	**D21** 27	**D22** C	**Q01** C	**Q02** 12
Q03 A	**Q04** B	**Q05** 28	**Q06** D	**Q07** A	**Q08** 66000
Q09 C	**Q10** 4	**Q11** A	**Q12** B	**Q13** 5	**Q14** D
Q15 A	**Q16** B	**Q17** 1458	**Q18** D	**Q19** 168	**Q20** B
Q21 75	**Q22** D				

VARC · 24 questions

RC 1 · The journeys that make a forest

A forest fruit is often described as a payment: the plant supplies food and an animal carries away its seeds. The metaphor is convenient but misleading if it suggests a dependable transaction between fixed partners. One bird may swallow a fruit whole, another may remove its flesh and drop the seed beneath the parent, and a third may destroy the seed. Even a single species can perform different roles as the availability of other foods changes. The visitor's presence is only the beginning of the explanation.

For the plant, successful dispersal requires several events. A seed must survive handling, reach a suitable location and escape hazards long enough to establish itself. Carrying many seeds a short distance may be valuable where seedlings survive nearby, but ineffective where disease is concentrated around mature plants. A less frequent visitor that travels farther can then make a disproportionately large contribution. There is consequently no universal ranking of dispersers independent of the landscape and the stage of regeneration being considered.

These complications become important when a forest loses a large animal. Smaller visitors may continue eating the same fruits, so the visible interaction appears to persist. Yet their narrower movements or inability to swallow large seeds may change which plants regenerate. The adult forest can retain its familiar appearance for decades because existing trees live much longer than the disrupted dispersal process. Its future composition is being altered before the alteration becomes conspicuous in its canopy.

It would nevertheless be a mistake to assume that every lost interaction is irreplaceable. Animals sometimes change diets or movements when competitors disappear. Several dispersers may already perform overlapping functions, providing some protection against the loss of one. Whether this protection is sufficient is an empirical question. Redundancy cannot be inferred merely from the number of species visiting a tree, but neither can its absence be inferred from the disappearance of a celebrated large visitor. The relevant alternatives must be examined.

Restoration therefore involves more than reintroducing a plant and waiting for its partners to return. A suitable disperser may need connected habitat outside the planting site; a suitable destination may need protection from grazing. Such measures can support an interaction without attempting to reproduce every detail of an earlier forest. The aim is to recover the processes that permit continuing regeneration. A forest is not simply a collection of organisms that happen to stand together; its persistence depends partly on journeys between them and on what happens after those journeys end.

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

A. Forest restoration requires returning every animal species that inhabited the original forest.
B. Large animals consistently disperse seeds more successfully than smaller visitors.
C. Forest regeneration depends on the effects of dispersal interactions, whose adequacy cannot be judged from visitor presence alone.
D. The survival of adult trees is the most reliable indicator of a functioning dispersal system.

Answer: C. Forest regeneration depends on the effects of dispersal interactions, whose adequacy cannot be judged from visitor presence alone.

The correct option connects handling, movement and establishment with regeneration. Complete historical reconstruction is explicitly unnecessary. Large visitors can matter disproportionately but receive no universal superiority. Long-lived adults can conceal a disrupted process rather than reliably reveal its health.

V02. Why can the adult forest remain apparently unchanged after a major disperser disappears? MCQ

A. Existing trees may persist while the recruitment of future trees is already changing.
B. Remaining animals immediately acquire all functions of the missing disperser.
C. Seeds do not require dispersal until the parent trees approach death.
D. The effects of animal loss arise only after every remaining visitor disappears.

Answer: A. Existing trees may persist while the recruitment of future trees is already changing.

Adult longevity creates a delay between altered recruitment and visible canopy change. Adaptation by remaining animals is possible, not guaranteed. Neither delayed seed dependence nor the disappearance of all visitors is required by the argument.

V03. Which finding most strongly supports functional redundancy after the loss of a disperser? MCQ

A. The same number of animal species continues to visit the fruiting trees.
B. The surviving trees produce as many fruits as they produced before the loss.
C. A smaller animal now spends more time feeding below the parent trees.
D. Other animals deliver the affected seeds to suitable sites and establishment remains comparable.

Answer: D. Other animals deliver the affected seeds to suitable sites and establishment remains comparable.

Comparable delivery and establishment address the lost function itself. Visitor counts and fruit output concern earlier stages that may remain intact despite failed dispersal. More feeding beneath parents could still leave seeds at hazardous sites and does not establish replacement.

V04. The fourth paragraph chiefly qualifies which possible conclusion? MCQ

A. An animal can sometimes destroy a seed while feeding on a fruit.
B. Every disappearance of a prominent disperser necessarily eliminates an irreplaceable function.
C. Regeneration involves events after a seed has been transported.
D. Landscape conditions can affect the value of a disperser's movements.

Answer: B. Every disappearance of a prominent disperser necessarily eliminates an irreplaceable function.

The paragraph introduces behavioural adjustment and overlapping functions to resist automatic claims of irreplaceability. The other statements are accepted components of the explanation and are not weakened by the qualification.

RC 2 · Who is being called “you”?

The second person in fiction appears to offer the shortest possible route from a sentence to its reader. Write "you enter the room", and the reader seems to have been placed inside the scene. Yet actual readers seldom confuse their bodies with the character's body. Someone reading on a train knows that entering a fictional room is not an instruction to leave the carriage. The interesting effect of the second person begins with this distance, rather than with its complete disappearance.

Sometimes the addressed "you" is a character speaking to an earlier self. The form then divides a life into the person who acted and the person who now judges the action. At other times an unnamed narrator addresses another fictional person. The reader overhears an intimacy whose history is only gradually disclosed. In both cases the grammatical address reaches the reader, but its fictional destination lies elsewhere. A story can exploit that double direction without asking anyone to mistake it for a literal conversation.

The form may also enlist experiences that are widely shared. "You reach for the light before remembering the power cut" briefly recruits a habitual movement familiar to many readers. Familiarity can make the sentence feel immediate even when the situation is invented. But the same form becomes resistant when it assigns a feeling the reader rejects: "you welcome the humiliation" may provoke an inward refusal. That refusal is not necessarily a failure of the story. It can make coercion, accusation or a character's mistaken assumptions perceptible.

For this reason, claims that second-person writing is inherently immersive are too simple. Immersion itself can mean different things: sustained attention, emotional involvement or an imagined position within a scene. A resistant reader may remain intensely attentive while refusing the position offered. A reader of a first-person novel may, conversely, become absorbed without ever being addressed. Pronouns help organise a relation; they do not independently determine the experience produced by that relation.

Judging the technique therefore requires asking what a particular story accomplishes through address. Does it let a character evade responsibility by turning "I did this" into "you do this"? Does it make a

private experience sound like a rule everyone must obey? Does it establish a listener whose silence gradually becomes significant? The same grammatical device can perform any of these tasks. Its force lies in the shifting relation among speaker, addressee and overhearing reader, not in a mechanical ability to abolish the boundary between the page and the person holding it.

V05. The passage primarily argues that second-person narration: MCQ

A. succeeds when readers cease distinguishing their physical situation from the character's.
B. creates varied relations of address whose literary effects depend on context, including possible reader resistance.
C. works best when the addressee is eventually revealed to be the narrator's earlier self.
D. is less effective than first-person narration at sustaining emotional involvement.

Answer: B. creates varied relations of address whose literary effects depend on context, including possible reader resistance.

The correct option covers the varied destinations and effects of address. Literal bodily confusion is rejected. No preferred addressee or general ranking against first-person fiction is supplied. The emphasis is contextual rather than competitive.

V06. A reader rejects a feeling attributed to "you" but becomes more attentive to the narrator's controlling behaviour. The author would regard this as: MCQ

A. evidence that second-person fiction cannot produce emotional involvement.
B. a sign that the reader has mistaken fictional address for a literal command.
C. a failure that can be repaired only by changing the narrative pronoun.
D. a possible achievement of the form despite the refusal of the offered identity.

Answer: D. a possible achievement of the form despite the refusal of the offered identity.

Resistance can reveal coercion while sustaining attention, exactly the productive possibility discussed. It establishes neither an impossibility of involvement nor literal misunderstanding. Changing pronouns is not presented as a necessary remedy.

V07. What role does the example of a reader on a train play? MCQ

A. It separates grammatical address from literal relocation, preparing the argument about more complex effects.
B. It explains why second-person fiction is most effective when read while travelling.
C. It shows that readers must imagine a character's movements before understanding a sentence.
D. It demonstrates that physical surroundings prevent readers from becoming absorbed in fiction.

Answer: A. It separates grammatical address from literal relocation, preparing the argument about more complex effects.

The example establishes the obvious boundary that the later analysis treats as productive. Travel is incidental. The text neither imposes a mental sequence for comprehension nor denies absorption in an ordinary physical setting.

V08. Which question would best guide the kind of evaluation advocated in the last paragraph? MCQ

A. How frequently does the pronoun "you" occur compared with "I"?
B. Would every reader recognise the physical habits described in the story?
C. How does the story's address redistribute responsibility between its speaker and its implied listener?
D. Does the second person always generate stronger immersion than the third person?

Answer: C. How does the story's address redistribute responsibility between its speaker and its implied listener?

The correct question examines a contextual function of address. Counting pronouns alone cannot establish that function. Universal recognition and universal comparative superiority repeat precisely the automatic claims that the author resists.

RC 3 · Livelihoods across places

Seasonal migration is often represented as a halfway condition: workers have left the village but have not yet settled permanently in the city. A policy built on this picture may regard repeated return as a sign that migration has failed. For some households, however, movement between places is an intended arrangement. Agricultural work is concentrated in certain months, urban demand in others, and neither location alone offers a dependable income throughout the year. A household can combine imperfect opportunities rather than choose one complete livelihood.

The arrangement is not sustained by wages alone. Someone must care for children, maintain a dwelling, cultivate land or negotiate access to shared resources while another member is away. Money sent home may compensate part of that work without making it visible as employment. The apparent flexibility of the mobile worker thus rests on obligations carried by less mobile people. Describing the household as a single decision-maker can obscure disagreement over who travels, who remains and whose ambitions are postponed.

There are also reasons not to romanticise movement as a clever response to uncertainty. Travel costs, unsafe lodging and interrupted access to public services can make circulation exhausting. A worker may return because a contractor withholds payment, not because a carefully balanced household plan calls for it. The same observed journey can arise from preference, negotiation or constraint. Its frequency alone does not disclose which explanation applies.

Policy need not decide that permanent settlement is always better, or that circulation must be preserved unchanged. Some measures improve the range of choices available in either case. Benefits that remain accessible across locations can reduce the cost of moving without compelling movement. Reliable rural employment can make staying possible without prohibiting an urban job. Affordable family housing may enable a household that wants to settle to do so, while accessible short-term accommodation serves workers who prefer to circulate. These provisions answer different needs rather than stages on a compulsory ladder.

Evaluating them requires attention to both persons and households over time. An increase in a family's annual earnings can coexist with a worsening burden on one member. A decline in migration can reflect either better local work or the disappearance of a valuable urban opportunity. The relevant achievement is an expansion of workable choices, assessed alongside their distribution within the household. Movement is neither inherently liberating nor inherently evidence of failure. It is one practice through which people organise livelihoods, and its meaning depends on the alternatives they actually have.

V09. Which statement best expresses the author’s position? MCQ

A. Repeated migration is the most efficient way for rural households to diversify income.
B. Governments should preserve seasonal movement because permanent settlement weakens village economies.
C. Household income is a sufficient measure of whether migration benefits its members.
D. Seasonal migration should be assessed through available livelihood choices and their unequal costs, rather than a universal settlement ideal.

Answer: D. Seasonal migration should be assessed through available livelihood choices and their unequal costs, rather than a universal settlement ideal.

The author supports context-sensitive assessment of choices and distribution. Efficiency and preservation are not universal prescriptions. Household income alone can conceal burdens imposed on particular members.

V10. Why does the author question treating the household as a single decision-maker? MCQ

A. Only the travelling member contributes economically to the household.
B. Members may bear different obligations and have conflicting preferences about mobility.
C. Families cannot coordinate work across more than one location.
D. Remittances eliminate any obligation owed to those who remain behind.

Answer: B. Members may bear different obligations and have conflicting preferences about mobility.

Differences in care work, postponed ambitions and negotiation challenge a unitary picture. The passage recognises contributions by those who stay and the possibility of coordination. It explicitly denies that money necessarily renders those contributions visible or exhausts the relationship.

V11. Which outcome is least interpretable without further information, according to the passage? MCQ

A. The introduction of benefits accessible in both the village and the city.
B. A reduction in the documented cost of travelling between the two locations.
C. A fall in migration following simultaneous changes in village employment and urban job availability.
D. The opening of accommodation for workers who wish to stay briefly.

Answer: C. A fall in migration following simultaneous changes in village employment and urban job availability.

A migration decline may reflect improved local choices or lost urban opportunities, producing opposite evaluations. The other outcomes describe concrete changes in access or cost. They still require assessment, but do not contain the specific directional ambiguity highlighted by the author.

V12. The third paragraph prevents the reader from concluding that: MCQ

A. a household's repeated movement must express an unconstrained strategy that works well for all its members.
B. urban and rural opportunities can sometimes complement one another.
C. public benefits may be difficult to access while travelling.
D. a contractor's refusal to pay can influence a worker's return.

Answer: A. a household's repeated movement must express an unconstrained strategy that works well for all its members.

The paragraph rejects romanticisation by presenting constraint and exploitation as alternative causes of circulation. Complementarity remains possible; service barriers and withheld wages are supporting examples, not conclusions being denied.

RC 4 · Reading time in stone

When geologists explain an ancient landscape using processes observable today, they are not necessarily claiming that the landscape formed at today's pace. A river cuts rock, waves sort sediment and molten material cools. Recognising these processes gives investigators tools for interpreting traces left long before anyone observed them. The claim that familiar mechanisms operated in the past is different from the claim that their rates and combinations have always been uniform.

This distinction matters because a slowly accumulated deposit and the aftermath of a short violent event can sometimes resemble each other. A thick layer of sand need not represent a long interval of ordinary deposition. It might have been laid down rapidly and then preserved because later conditions protected it. Conversely, a thin boundary can conceal a large span of time during which material was removed or nothing durable accumulated. Thickness is a physical measurement, not a clock that works without assumptions.

Geologists therefore combine clues. The size and orientation of grains may indicate flow conditions; structures within a layer may reveal repeated disturbances; the relation between one layer and its neighbours can constrain the order of events. No single clue need settle the matter. A proposed history gains strength when it explains several observations that were not all used to invent it. An attractive story that accounts for one striking feature can remain weak if it requires ignoring the ordinary details around that feature.

There is a parallel danger in making dramatic events the default explanation whenever a record is incomplete. Catastrophes leave compelling narratives, but a gap does not identify its own cause. Erosion can proceed under familiar conditions, and preservation is selective even without a singular disaster. The discipline's rejection of unsupported catastrophe stories should not be mistaken for a prohibition on abrupt change. A rapid event is acceptable when its proposed effects fit the evidence better than the alternatives, not when it provides the most memorable account.

The geological imagination must consequently work at two scales. It needs patience for effects that become substantial only over immense periods, and openness to intervals when exceptional conditions rearrange a landscape quickly. Neither patience nor drama is an explanation by itself. Both must be disciplined by traces whose relationships can be tested. The past becomes intelligible not because it is identical to the present, but because investigators can argue, with explicit limits, about which present understanding is relevant to a particular surviving record.

V13. Which distinction is most important to the passage? MCQ

A. Continuity of physical mechanisms does not imply constancy of their rates or combinations.
B. Ancient landscapes can be understood through stories but not through physical measurements.
C. Slow processes leave reliable records whereas violent events destroy all evidence.
D. Present observations are useful only when ancient environmental conditions were identical.

Answer: A. Continuity of physical mechanisms does not imply constancy of their rates or combinations.

The opening distinction governs the discussion of deposits and abrupt events. Measurements are useful with contextual assumptions. Both slow and rapid processes can leave interpretable traces, and identical conditions are expressly unnecessary.

V14. What can a thin boundary between rock layers represent? MCQ

A. A short event whose duration can be read directly from the boundary's width.
B. Proof that deposition occurred at a constant rate across the entire sequence.
C. A long interval of non-deposition or removal, despite its small physical thickness.
D. The absence of any meaningful geological process during that interval.

Answer: C. A long interval of non-deposition or removal, despite its small physical thickness.

The passage explicitly separates thickness from duration: missing or removed material can hide substantial time. The other options reinstall a direct thickness-clock relation, infer constancy without evidence, or mistake lack of deposition for lack of process.

V15. Which finding would most strengthen a proposed account of a rapid depositional event? MCQ

A. The account provides a vivid explanation of the thickest layer in the region.
B. Independent features of adjacent layers and grain orientation agree with consequences predicted by that account.
C. No observer has recorded an event of equal size during the last century.
D. The proposed event would have been more dramatic than gradual deposition.

Answer: B. Independent features of adjacent layers and grain orientation agree with consequences predicted by that account.

Support comes from explanatory reach across evidence not merely used to construct the account. Vividness and drama do not discriminate between histories. Absence of a recent observed counterpart does not, by itself, support an ancient event.

V16. The author's attitude towards catastrophe explanations is best described as: MCQ

A. dismissive because familiar mechanisms can explain every geological feature slowly.
B. enthusiastic because abrupt events make the historical record easier to interpret.
C. neutral because ancient events cannot be tested against surviving traces.
D. open to them when supported by comparative evidence, but resistant to using gaps as automatic proof.

Answer: D. open to them when supported by comparative evidence, but resistant to using gaps as automatic proof.

The author permits rapid events while demanding evidence against alternatives. Slow universalism and enthusiasm for drama are rejected. The passage also insists that interpretations can be tested, so neutrality through total unknowability misrepresents its position.

V17. Choose the best summary.

A city can make its public transport network easier to understand without changing a single route. A map that emphasises connections may help occasional riders plan journeys that a geographically precise street map makes difficult to see. But the same simplification can hide a long walk between stations or make a short above-ground journey appear to require a transfer. Neither map is therefore simply more truthful. Each preserves relations relevant to particular decisions while compressing others. A useful information system offers ways to recover the relations that its main representation suppresses, allowing passengers to move between an overview of connections and the practical details of travelling through the city. MCQ

A. Geographically precise maps should replace simplified network maps because they prevent unnecessary transfers.
B. The main purpose of transport maps is to persuade occasional riders to make journeys by public transport.
C. Transport representations serve different decisions; useful systems combine simplified connections with access to suppressed practical details.
D. Since every map hides information, passengers should rely primarily on direct experience of routes.

Answer: C. Transport representations serve different decisions; useful systems combine simplified connections with access to suppressed practical details.

The correct summary captures selective representation and complementary access. Replacing network maps denies their stated benefit. Persuasion is not discussed. Reliance on experience abandons the proposed information system and does not follow from selective compression.

V18. Choose the best summary.

A rehearsal is not merely an incomplete version of a performance. Actors may deliberately exaggerate a gesture, interrupt a scene or exchange roles to discover possibilities that should never appear before an audience. Judged by the standards of a polished show, these activities can look like errors or wasted time. Their value lies in what they permit the group to learn. This does not mean that every disruption is productive: an exercise needs some relation to a question the production is trying to resolve. Rehearsal has its own discipline, one that licenses provisional awkwardness while requiring participants to turn exploration into decisions about the eventual performance. MCQ

A. Rehearsals succeed when actors perform their roles exactly as they will before the audience.
B. Every interruption of a scene contributes to creativity by freeing actors from conventional standards.
C. The quality of a final performance depends chiefly on how often actors exchange roles during rehearsal.
D. Rehearsal uses disciplined experimentation whose temporary departures from performance standards can help resolve artistic questions.

Answer: D. Rehearsal uses disciplined experimentation whose temporary departures from performance standards can help resolve artistic questions.

The correct option includes both experimental licence and its purpose. Exact replication misses the central distinction. Universal productivity ignores the qualification. Role exchange is one example, not the principal determinant of quality.

V19. Choose the best position for the missing sentence.

Sentence: Those instructions allowed the mechanism to repeat a sequence without a performer directing each movement.

(1) Early mechanical theatres used carefully arranged rotating cylinders to coordinate the actions of miniature figures. Pins placed on a cylinder lifted levers as it turned, making a door open or a tiny musician raise an arm. (2) The order and spacing of the pins encoded instructions for the scene. (3) Repetition was therefore built into the arrangement of the machine, rather than supplied anew by a human operator at every step. The operator still had important tasks, including winding the mechanism and correcting faults. (4) Automation changed the distribution of work; it did not remove every form of human involvement from the entertainment. MCQ

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

Answer: A. Position (3)

Position (3) follows the introduction of encoded instructions and explains the repeated sequence developed by “Repetition was therefore”. Earlier positions lack the clear instruction antecedent; the final position interrupts the transition to the operator’s continuing tasks.

V20. Choose the best position for the missing sentence.

Sentence: This second audience could judge the exchange without possessing the full information available to either participant.

A diplomatic letter was addressed to a particular recipient, but its writer might also expect it to circulate. (1) The immediate reader could understand a reference to an earlier private conversation that the letter did not describe. Copies might then be read by officials elsewhere who had never heard that conversation. (2) Their judgements could nevertheless influence whether the agreement survived. Writers therefore had to manage both a specific relationship and the impressions created at a distance. (3) A phrase that reassured the recipient might appear evasive to those later readers. (4) The document's tone can be understood only by considering these overlapping situations of reading. MCQ

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

Answer: B. Position (2)

Position (2) follows the officials who form the second audience and supplies the subject of "Their judgements". At (1) the second audience is not yet identified; later positions separate the judgement explanation from its consequence and weaken the reference chain.

V21. Arrange the sentences and enter their numbers without spaces.

1. The animal can then use the interval between its own call and the returning echo to estimate distance.
2. This calculation requires a distinction between a sound it produced and similar sounds arriving from elsewhere.
3. An echolocating animal emits a sound that may bounce from an obstacle and return.
4. Hearing a loud noise is therefore not enough; the timing and identity of the sound both matter.
TITA

Answer: 3124

3 introduces emission and return; 1 explains how their interval estimates distance. 2's "This calculation" adds the identity requirement. 4 concludes by combining timing and identity, so it belongs after both have been established.

V22. Arrange the sentences and enter their numbers without spaces.

1. Yet that imagined account may collapse when the missing exchange is finally shown.
2. A film may show a character reacting before revealing the exchange that provoked her reaction.
3. Such a collapse asks viewers to revise an interpretation they have already formed.
4. Until that exchange is shown, her expression invites the audience to imagine what might have happened. TITA

Answer: 2413

2 introduces a reaction and an exchange withheld from view; 4 gives the audience's imagined account during the delay. 1 requires that imagined account and describes its collapse. 3's "Such a collapse" then states the demand for revision. These references establish 2–4–1–3.

V23. Four sentences form a coherent paragraph. Enter the odd sentence number.

1. A seed bank preserves material that might otherwise disappear from cultivated fields.
2. Its usefulness depends partly on records of where each sample came from and how it was collected.
3. Some agricultural machines can plant several rows at the same time.
4. Without those records, researchers may be unable to identify the conditions to which a stored variety was adapted.
5. Conservation therefore includes maintaining information about the samples as well as keeping them viable. TITA

Answer: 3

1–2–4–5 explain why seed conservation requires provenance information as well as viable material. Sentence 3 concerns planting machinery and does not develop the dependency between stored samples and their records.

V24. Four sentences form a coherent paragraph. Enter the odd sentence number.

1. The availability of that alternative can strengthen a worker's position even if she does not resign.
2. A worker who receives another credible job offer gains an option outside her current employment.
3. Employers sometimes change the names of departments during internal reorganisations.
4. Bargaining power can therefore depend on opportunities that remain unused.
5. Her employer knows that refusing every request may now cause her to leave. TITA

Answer: 3

The coherent order is 2–1–5–4: an outside offer creates an option, strengthens bargaining, changes the employer's incentives and supports the general conclusion. Department names do not bear on the mechanism.

DILR · 22 questions

Four-depot stock reconciliation

Four depots A, B, C and D together initially hold 400 sealed crates. They simultaneously make these transfers: A sends 20 to B; B sends 15 to C; C sends 10 to D; D sends 5 to A. There are no other receipts, dispatches or losses. After the transfers, A:B stocks are 5:7 and C:D stocks are 25:19. Before the transfers, C held exactly four-thirds as many crates as A. All stocks are whole crates.

Any additional condition or change in a question applies only to that question.

D01. How many crates did B hold initially? TITA

Answer: 100

The transfers change A, B, C and D by −15, +5, +5 and +5. Put their final stocks at 5k, 7k, 25m and 19m. Then 12k + 44m = 400 and 3(25m − 5) = 4(5k + 15). Solving gives k = 15 and m = 5.
Depot | Before | After
A | 90 | 75
B | 100 | 105
C | 120 | 125
D | 90 | 95

B initially held 105 − 5 = 100 crates.

D02. Which depot has the greatest final stock? MCQ

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

Answer: A. C

The transfers change A, B, C and D by −15, +5, +5 and +5. Put their final stocks at 5k, 7k, 25m and 19m. Then 12k + 44m = 400 and 3(25m − 5) = 4(5k + 15). Solving gives k = 15 and m = 5.
Depot | Before | After
A | 90 | 75
B | 100 | 105
C | 120 | 125
D | 90 | 95

Final stocks are 75, 105, 125 and 95; C is greatest.

D03. After the stated transfers, how many crates must B send to D to make their stocks equal? TITA

Answer: 5

The transfers change A, B, C and D by −15, +5, +5 and +5. Put their final stocks at 5k, 7k, 25m and 19m. Then 12k + 44m = 400 and 3(25m − 5) = 4(5k + 15). Solving gives k = 15 and m = 5.
Depot | Before | After
A | 90 | 75
B | 100 | 105
C | 120 | 125
D | 90 | 95

105 − x = 95 + x gives x = 5.

D04. Which depot has the greatest percentage increase relative to its own initial stock? MCQ

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

Answer: B. D

The transfers change A, B, C and D by −15, +5, +5 and +5. Put their final stocks at 5k, 7k, 25m and 19m. Then 12k + 44m = 400 and 3(25m − 5) = 4(5k + 15). Solving gives k = 15 and m = 5.
Depot | Before | After
A | 90 | 75
B | 100 | 105
C | 120 | 125
D | 90 | 95

B, C and D each gain five, but D's initial base is smallest: 5/90 exceeds 5/100 and 5/120. A loses stock.

D05. What is the smallest combined final stock of any two depots? MCQ

A. 200
B. 190
C. 170
D. 180

Answer: C. 170

The transfers change A, B, C and D by –15, +5, +5 and +5. Put their final stocks at 5k, 7k, 25m and 19m. Then 12k + 44m = 400 and 3(25m – 5) = 4(5k + 15). Solving gives k = 15 and m = 5.
Depot | Before | After
A | 90 | 75
B | 100 | 105
C | 120 | 125
D | 90 | 95

Choose A and D: 75 + 95 = 170.

Seats around the circular table

Eight people A through H occupy eight equally spaced seats around a circular table. Number the positions 1 to 8 clockwise, and fix A in position 1. E is in position 4, 5 or 6. C is immediately clockwise from B, and F is immediately clockwise from D. G is opposite C. H is adjacent to E. Every person occupies one seat. A gap of two clockwise positions means one occupied seat lies between the two people.

Any additional condition or change in a question applies only to that question.

D06. How many seating arrangements satisfy every condition? TITA

Answer: 3

Fix A in position 1 to remove rotational duplicates. B–C and D–F must each be clockwise adjacent blocks; G is opposite C. Checking the permitted E positions and the H adjacency leaves exactly:
ADFGEHBC
ADFGHEBC
AGHEBCDF
Each row lists positions 1 through 8 clockwise. Mirror images are distinct because clockwise conditions matter.

The exhaustive block placement gives the three displayed orders.

D07. Which person cannot be opposite A? MCQ

A. B
B. F
C. H
D. E

Answer: B. F

Fix A in position 1 to remove rotational duplicates. B–C and D–F must each be clockwise adjacent blocks; G is opposite C. Checking the permitted E positions and the H adjacency leaves exactly:
ADFGEHBC
ADFGHEBC
AGHEBCDF
Each row lists positions 1 through 8 clockwise. Mirror images are distinct because clockwise conditions matter.

The persons opposite A in the three orders are E, H and B; never F.

D08. If E is opposite A, what is F's position number? TITA

Answer: 3

Fix A in position 1 to remove rotational duplicates. B–C and D–F must each be clockwise adjacent blocks; G is opposite C. Checking the permitted E positions and the H adjacency leaves exactly:
ADFGEHBC
ADFGHEBC
AGHEBCDF
Each row lists positions 1 through 8 clockwise. Mirror images are distinct because clockwise conditions matter.

Only ADFGEHBC has E opposite A. F occupies position 3.

D09. If H is two positions clockwise from G, how many people lie strictly between C and D when travelling clockwise from C? TITA

Answer: 1

Fix A in position 1 to remove rotational duplicates. B–C and D–F must each be clockwise adjacent blocks; G is opposite C. Checking the permitted E positions and the H adjacency leaves exactly:
ADFGEHBC
ADFGHEBC
AGHEBCDF
Each row lists positions 1 through 8 clockwise. Mirror images are distinct because clockwise conditions matter.

Only ADFGEHBC satisfies the extra condition. Clockwise from C to D, only A lies between them, so the answer is 1.

D10. Who can occupy the position immediately clockwise from A? MCQ

A. D or G only
B. D only
C. D, F or G
D. F or G only

Answer: A. D or G only

Fix A in position 1 to remove rotational duplicates. B–C and D–F must each be clockwise adjacent blocks; G is opposite C. Checking the permitted E positions and the H adjacency leaves exactly:
ADFGEHBC
ADFGHEBC
AGHEBCDF
Each row lists positions 1 through 8 clockwise. Mirror images are distinct because clockwise conditions matter.

The three arrangements have D, D and G in position 2.

Course-registration overlap

A college has 150 students. Courses A, B and C have 90, 80 and 70 registrants respectively. Exactly 135 students take at least one of them. The numbers taking both A and B, both A and C, and both B and C are 50, 40 and 35 respectively; each of these pair counts includes students taking all three. A student may take zero, one, two or all three courses.

Any additional condition or change in a question applies only to that question.

D11. How many students take all three courses? TITA

Answer: 20

Inclusion–exclusion gives 135 = 90 + 80 + 70 – 50 – 40 – 35 + t, hence t = 20. Subtract t from each pair total before obtaining single-course regions.
Region | Students
A only | 20
B only | 15
C only | 15
AB only | 30
AC only | 20
BC only | 15
ABC | 20
None | 15

The inclusion–exclusion equation gives 20.

D12. How many students take exactly two courses? MCQ

A. 45
B. 85
C. 50
D. 65

Answer: D. 65

Inclusion–exclusion gives 135 = 90 + 80 + 70 – 50 – 40 – 35 + t, hence t = 20. Subtract t from each pair total before obtaining single-course regions.
Region | Students
A only | 20
B only | 15
C only | 15
AB only | 30
AC only | 20
BC only | 15
ABC | 20
None | 15

Add the pair-only regions: 30 + 20 + 15 = 65.

D13. How many students take A but neither B nor C? TITA

Answer: 20

Inclusion–exclusion gives 135 = 90 + 80 + 70 − 50 − 40 − 35 + t, hence t = 20. Subtract t from each pair total before obtaining single-course regions.
Region | Students
A only | 20
B only | 15
C only | 15
AB only | 30
AC only | 20
BC only | 15
ABC | 20
None | 15

A-only = 90 − 50 − 40 + 20 = 20.

D14. Among C registrants, what fraction take exactly two courses? MCQ

A. 1/2
B. 5/7
C. 2/7
D. 3/7

Answer: A. 1/2

Inclusion–exclusion gives 135 = 90 + 80 + 70 − 50 − 40 − 35 + t, hence t = 20. Subtract t from each pair total before obtaining single-course regions.
Region | Students
A only | 20
B only | 15
C only | 15
AB only | 30
AC only | 20
BC only | 15
ABC | 20
None | 15

Of C's 70 registrants, AC-only + BC-only = 20 + 15 = 35 take exactly two; 35/70 = 1/2.

Deliveries with transit loss

Hub A receives 80 packages and hub B receives 120. Each hub sends every package to either C or D. Exactly one quarter of packages sent on A→C are damaged and discarded before arrival; none are lost on A→D or B→C. Exactly one fifth of packages sent on B→D are damaged and discarded. C receives 100

usable packages and D receives 80. No other routes or losses exist, and all numbers of packages sent and lost are integers.

Any additional condition or change in a question applies only to that question.

D15. How many packages were sent on A→C? TITA

Answer: 40

Let x be packages sent A→C and y those sent B→C. Then 3x/4 + y = 100 and (80 − x) + 4(120 − y)/5 = 80. Solving gives x = 40 and y = 70. The sent/usable route counts are A→C 40/30, A→D 40/40, B→C 70/70 and B→D 50/40.

The simultaneous conservation equations give x = 40.

D16. How many usable packages does D receive from B? MCQ

A. 40
B. 60
C. 30
D. 50

Answer: A. 40

Let x be packages sent A→C and y those sent B→C. Then 3x/4 + y = 100 and (80 − x) + 4(120 − y)/5 = 80. Solving gives x = 40 and y = 70. The sent/usable route counts are A→C 40/30, A→D 40/40, B→C 70/70 and B→D 50/40.

B sends 120 − 70 = 50 towards D; four fifths, or 40, arrive usable.

D17. How many packages are damaged in total? TITA

Answer: 20

Let x be packages sent A→C and y those sent B→C. Then 3x/4 + y = 100 and (80 − x) + 4(120 − y)/5 = 80. Solving gives x = 40 and y = 70. The sent/usable route counts are A→C 40/30, A→D 40/40, B→C 70/70 and B→D 50/40.

Usable arrivals total 180 against 200 dispatched; the difference is 20.

D18. What percentage of C's usable arrivals came from B? MCQ

A. 60%
B. 70%
C. 75%
D. 80%

Answer: B. 70%

Let x be packages sent A→C and y those sent B→C. Then 3x/4 + y = 100 and (80 − x) + 4(120 − y)/5 = 80. Solving gives x = 40 and y = 70. The sent/usable route counts are A→C 40/30, A→D 40/40, B→C 70/70 and B→D 50/40.

B supplies 70 of C's 100 usable arrivals.

Three-project development portfolio

A council chooses exactly three of eight projects. Total cost must not exceed 12 units and total risk must not exceed 6. Benefits add. Exactly one of A and B must be chosen. If C is chosen, D must also be chosen. There are no other restrictions.

Project | Cost | Risk | Benefit
A | 4 | 2 | 9
B | 5 | 3 | 12
C | 3 | 3 | 8
D | 4 | 1 | 7
E | 6 | 2 | 15
F | 2 | 2 | 6
G | 5 | 4 | 14
H | 3 | 1 | 8

Any additional condition or change in a question applies only to that question.

D19. How many feasible portfolios are there? TITA

Answer: 8

Enumerate the triples with exactly one of A and B, apply C's prerequisite, and reject excess cost or risk. The complete feasible table is:
Projects | Cost | Risk | Benefit
ACD | 11 | 6 | 24
ADF | 10 | 5 | 22
ADH | 11 | 4 | 24
AEF | 12 | 6 | 30
AFH | 9 | 5 | 23
BDF | 11 | 6 | 25
BDH | 12 | 5 | 27
BFH | 10 | 6 | 26

Eight triples survive every restriction.

D20. Which portfolio has the maximum benefit? MCQ

A. BFH
B. ACD
C. AEF
D. BDH

Answer: C. AEF

Enumerate the triples with exactly one of A and B, apply C's prerequisite, and reject excess cost or risk. The complete feasible table is:
Projects | Cost | Risk | Benefit
ACD | 11 | 6 | 24
ADF | 10 | 5 | 22
ADH | 11 | 4 | 24
AEF | 12 | 6 | 30
AFH | 9 | 5 | 23
BDF | 11 | 6 | 25
BDH | 12 | 5 | 27
BFH | 10 | 6 | 26

AEF has benefit 30, exceeding the next-best BDH at 27.

D21. If H must be selected, what is the largest attainable benefit? TITA

Answer: 27

Enumerate the triples with exactly one of A and B, apply C's prerequisite, and reject excess cost or risk. The complete feasible table is:
Projects | Cost | Risk | Benefit
ACD | 11 | 6 | 24
ADF | 10 | 5 | 22
ADH | 11 | 4 | 24
AEF | 12 | 6 | 30
AFH | 9 | 5 | 23
BDF | 11 | 6 | 25
BDH | 12 | 5 | 27
BFH | 10 | 6 | 26

The feasible H portfolios are ADH, AFH, BDH and BFH; their benefits are 24, 23, 27 and 26. The maximum is 27.

D22. What is the minimum cost among feasible portfolios with benefit at least 25? MCQ

A. 12
B. 11
C. 10
D. 9

Answer: C. 10

Enumerate the triples with exactly one of A and B, apply C's prerequisite, and reject excess cost or risk. The complete feasible table is:
Projects | Cost | Risk | Benefit
ACD | 11 | 6 | 24
ADF | 10 | 5 | 22
ADH | 11 | 4 | 24
AEF | 12 | 6 | 30
AFH | 9 | 5 | 23
BDF | 11 | 6 | 25
BDH | 12 | 5 | 27
BFH | 10 | 6 | 26

Qualifying portfolios AEF, BDF, BDH and BFH cost 12, 11, 12 and 10. BFH attains the minimum 10.

QA · 22 questions

Q01. An appliance is marked 20% above its purchase cost. A customer receives a fixed discount of ₹60 on the marked price and pays ₹1,080. What was the purchase cost, in rupees? MCQ

A. 900
B. 960
C. 950
D. 1000

Answer: C. 950

If cost is C, marked price is 1.2C. Thus 1.2C − 60 = 1,080, so C = 1,140/1.2 = ₹950. The discount is a fixed amount and must be subtracted after calculating the marked price.

Q02. A team of 24 employees has an average monthly salary of ₹50,000. Eight employees whose average salary is ₹65,000 leave. New employees, each earning ₹60,000 per month, then join. The resulting team again averages ₹50,000. How many employees join? TITA

Answer: 12

Use thousands of rupees. Original payroll is 24 × 50 = 1,200; departing employees account for 8 × 65 = 520, leaving 680 for 16 people. If n employees join, 680 + 60n = 50(16 + n). Hence 10n = 120 and n = 12.

Q03. A train takes 12 seconds to pass a signal pole and 24 seconds to cross a bridge 180 metres long. It maintains the same speed throughout. What is its speed in km/h? MCQ

A. 54
B. 45
C. 60
D. 72

Answer: A. 54

Let the train length be L metres and speed v m/s. Passing the pole gives L = 12v; crossing the bridge gives L + 180 = 24v. Subtracting yields v = 15 m/s, or 15 × 18/5 = 54 km/h.

Q04. A can complete a job in 12 days and B in 18 days. They work on alternate days, A starting on day 1. On the last day, work stops as soon as the job is complete. How many days elapse? MCQ

A. 14
B. 43/3
C. 44/3
D. 15

Answer: B. 43/3

A two-day cycle completes 1/12 + 1/18 = 5/36 of the job. Seven cycles take 14 days and complete 35/36. A works next and needs (1/36)/(1/12) = 1/3 day. Total elapsed time is 14 + 1/3 = 43/3 days.

Q05. An 80-litre solution contains 30% salt by volume. Only water evaporates. Afterwards, 20 litres of pure water are added, producing a solution containing exactly one-third salt by volume. Assuming volumes are additive, how many litres of water evaporated? TITA

Answer: 28

Salt remains 80 × 0.30 = 24 litres. A one-third concentration requires final volume 24 ÷ (1/3) = 72 litres. If x litres evaporate, final volume is 80 − x + 20. Therefore 100 − x = 72, giving x = 28.

Q06. A dealer sells two watches for ₹1,200 each. On one he gains 25% on cost; on the other he loses 20% on cost. What is the overall loss percentage? MCQ

A. 5/2
B. 5
C. 0
D. 100/41

Answer: D. 100/41

The two costs are 1,200/1.25 = 960 and 1,200/0.8 = 1,500. Total cost is 2,460 and revenue is 2,400, so loss is 60. Loss percentage = 60/2,460 × 100 = 100/41. Averaging the two percentages is invalid because their cost bases differ.

Q07. A loan of ₹11,000 is repaid through two payments of ₹7,200 each, made exactly one and two years after borrowing. Interest is compounded annually at a fixed positive rate, and each payment is credited immediately after that year's interest. What is the annual interest rate, in percent? MCQ

A. 20
B. 15
C. 25
D. 30

Answer: A. 20

Write the annual growth factor as $r > 1$. After the first payment the balance is $11{,}000r - 7{,}200$. After the second year it is $(11{,}000r - 7{,}200)r - 7{,}200 = 0$. Thus $55r^2 - 36r - 36 = 0 = (5r - 6)(11r + 6)$. The positive admissible factor is $6/5$, giving an annual rate of 20%.

Q08. A contract requires 120 standard worker-days of output and must be completed in 10 working days. An experienced worker produces 1.5 standard worker-days per day and costs ₹900 per day; an apprentice produces 1 and costs ₹500. At most four experienced workers and eight apprentices are available. Every hired worker must be paid for all 10 days. Hiring numbers must be integers, and excess output is allowed. What is the minimum total wage bill, in rupees? TITA

Answer: 66000

If e experienced workers and a apprentices are hired, output is $15e + 10a$ and wages are $9{,}000e + 5{,}000a$. With $e = 0$, 1 or 2, even eight apprentices cannot deliver 120. With $e = 3$, a must be at least 8, costing 67,000. With $e = 4$, a must be at least 6, costing 66,000. Thus four experienced workers and six apprentices give the minimum ₹66,000.

Q09. Real numbers x and y satisfy $x + y = 9$ and $xy = 18$. What is the value of $(x^2 + y^2)/(x - y)^2$? MCQ

A. 3
B. 4
C. 5
D. 9

Answer: C. 5

The numerator is $(x + y)^2 - 2xy = 81 - 36 = 45$. The denominator is $(x + y)^2 - 4xy = 81 - 72 = 9$. Their ratio is 5. The denominator is nonzero, so the expression is defined.

Q10. Find the real number x satisfying $\log_2(x) + \log_2(x - 2) = 3$. TITA

Answer: 4

Both logarithms require $x > 2$. Combining them gives $x(x - 2) = 2^3 = 8$, so $x^2 - 2x - 8 = (x - 4)(x + 2) = 0$. Only $x = 4$ satisfies the original domain.

Q11. How many integer values of x satisfy $|2x - 3| < x + 4$? MCQ

A. 7
B. 6
C. 8
D. 9

Answer: A. 7

The inequality requires $-(x + 4) < 2x - 3 < x + 4$. The left inequality gives $x > -1/3$, and the right gives $x < 7$. These bounds also make $x + 4$ positive. The integers are 0, 1, 2, 3, 4, 5, 6: seven values.

Q12. For which real values of k does $x^2 - 2kx + k + 6 = 0$ have two distinct real roots, both strictly between 1 and 5? Give the total length of the permitted set of k-values. MCQ

A. 1/3
B. 4/9
C. 5/9
D. 1

Answer: B. 4/9

The upward parabola must have its vertex k between 1 and 5, positive values at $x = 1$ and $x = 5$, and positive discriminant. These give $1 < k < 5$, $7 - k > 0$, $31 - 9k > 0$, and $(k - 3)(k + 2) > 0$. Combining them yields $3 < k < 31/9$. Its length is $31/9 - 3 = 4/9$. The endpoints are excluded, but that does not change interval length.

Q13. A real-valued function is defined for every nonzero real x and satisfies $f(x) + 2f(1/x) = 6x$. Find $f(2) + f(1/2)$. TITA

Answer: 5

At $x = 2$, $f(2) + 2f(1/2) = 12$. At $x = 1/2$, $f(1/2) + 2f(2) = 3$. Adding gives $3[f(2) + f(1/2)] = 15$. Hence the requested sum is 5. Individually the values are $f(2) = -2$ and $f(1/2) = 7$, which satisfy both equations.

Q14. A right trapezium has parallel sides of lengths 6 cm and 12 cm. A circle inside it touches all four sides. What is the radius of the circle, in centimetres? MCQ

A. 3
B. 6
C. 8
D. 4

Answer: D. 4

Let the height be h. One non-parallel side has length h, and the other has length $\sqrt{(h^2 + 6^2)}$. In a tangential quadrilateral, sums of opposite sides are equal, so $h + \sqrt{(h^2 + 36)} = 18$. Squaring after isolating the root gives $h = 8$. The circle touches both parallel sides, so its diameter is h; radius = 4.

Q15. A convex cyclic quadrilateral ABCD satisfies AB = BC = 5 cm and CD = DA = 8 cm. What is the square of the diagonal BD, in square centimetres? MCQ

A. 89
B. 64
C. 81
D. 169

Answer: A. 89

Triangles BAD and BCD have the same three side lengths, so angles BAD and BCD are equal. They are opposite angles of a cyclic quadrilateral and sum to 180°, making each 90°. In right triangle BAD, $BD^2 = BA^2 + AD^2 = 25 + 64 = 89$.

Q16. The line x/6 + y/8 = 1 and the coordinate axes form a triangle. Let its circumcircle have two tangents of the form x + y = k. What is the product of the two possible k-values? MCQ

A. 1
B. -1
C. 7
D. 49

Answer: B. -1

The triangle is right-angled at the origin, so its circumcentre is the midpoint of (6,0) and (0,8): (3,4), with radius 5. Tangency requires $|k - 7|/\sqrt{2} = 5$. Therefore $k = 7 \pm 5\sqrt{2}$, and their product is $49 - 50 = -1$.

Q17. In a geometric progression of positive terms, the second term is 6 and the fifth term is 162. What is the seventh term? TITA

Answer: 1458

If the first term is a and the common ratio is r, then $ar = 6$ and $ar^4 = 162$. Dividing gives $r^3 = 27$, so $r = 3$ and $a = 2$. The seventh term is $ar^6 = 2 \times 729 = 1458$.

Q18. What is the smallest three-digit positive integer N such that N + 5 is divisible by 12, 18 and 30? MCQ

A. 115
B. 145
C. 355
D. 175

Answer: D. 175

The least common multiple of 12, 18 and 30 is $2^2 \times 3^2 \times 5 = 180$. Thus $N = 180m - 5$. The first three-digit positive value is $180 - 5 = 175$.

Q19. Find the sum of all positive divisors of 72 that are also divisible by 6. TITA

Answer: 168

The qualifying divisors are 6, 12, 18, 24, 36 and 72. Their sum is 168. Equivalently, since $72 = 2^3 3^2$, choose the exponent of 2 from 1,2,3 and that of 3 from 1,2: sum $= (2 + 4 + 8)(3 + 9) = 14 \times 12 = 168$.

Q20. Three numbers A, B and C satisfy A + B = 50, B + C = 66 and C + A = 58. What is the largest of the three numbers? MCQ

A. 29
B. 37
C. 33
D. 35

Answer: B. 37

Adding the three equations gives $2(A + B + C) = 174$, so $A + B + C = 87$. Subtracting each pair sum from 87 gives $C = 87 - 50 = 37$, $A = 87 - 66 = 21$ and $B = 87 - 58 = 29$. The largest number is C = 37.

Q21. A committee of four is chosen from five men and four women. It must contain at least two women. Two particular men are unwilling to serve together. How many committees satisfy all conditions? TITA

Answer: 75

Ignoring the incompatible pair, choose 2, 3 or 4 women: C(4,2)C(5,2) + C(4,3)C(5,1) + C(4,4) = 60 + 20 + 1 = 81. A forbidden committee contains both particular men and two women, giving C(4,2) = 6 cases. Therefore 81 – 6 = 75 committees are permitted.

Q22. The fourth term of an arithmetic progression is 14 and the sum of its first ten terms is 185. What is its twentieth term? MCQ

A. 59
B. 65
C. 68
D. 62

Answer: D. 62

Let the first term be a and the common difference d. Then a + 3d = 14 and (10/2)(2a + 9d) = 185, so 2a + 9d = 37. Doubling the first equation gives 2a + 6d = 28, hence 3d = 9, d = 3 and a = 5. The twentieth term is a + 19d = 5 + 57 = 62.