GATE General Aptitude

Sample Paper – 3

Duration: 28 Minutes **Maximum Marks: 15**

Instructions

- This paper contains **10** questions, modelled on the General Aptitude section of **GATE** conducted by the IITs and IISc.
- The **10-question** length and the **15-mark** total match the General Aptitude section of the real 65-question paper exactly: **5 questions of 1 mark** (Q1–Q5) and **5 questions of 2 marks** (Q6–Q10).
- Each question carries **negative marking of one-third of its allotted marks**: a wrong 1-mark question costs **0.33** and a wrong 2-mark question costs **0.67**. Unattempted questions carry no penalty.
- Every question here is a **Multiple Choice Question** with exactly one correct option. The real GA section may also include Multiple Select Questions (MSQ) and Numerical Answer Type (NAT) questions, and **those two types carry no negative marking** – never leave a NAT blank.
- Attempt this practice paper in one timed sitting of about **28 minutes**, the share this section earns at the paper's overall pace of 180 minutes for 65 questions.

Verbal Aptitude

Q1. Choose the option that fills the blank with the **correct preposition**.

The design team has been working _____ the revised layout since Monday. [1 mark]

(A) at

(B) on

(C) in

(D) for

Q2. *Ductile* is to *wire* as *malleable* is to _____. [1 mark]

(A) rod

(B) beam

(C) coil

(D) sheet

Q3. The sentence below is split into four parts. Identify the part that contains a **grammatical error**.

(A) The engineer explained **(B)** that the failure occurred **(C)** because the bolt had been **(D)** tighten beyond its rated torque. [1 mark]

(A) The engineer explained

(B) that the failure occurred

(C) because the bolt had been

(D) tighten beyond its rated torque

Quantitative Aptitude

Q4. A train covers the first 60 km of a journey at a uniform speed of 30 km/h and the next 60 km at a uniform speed of 60 km/h. Its average speed for the whole journey is: [1 mark]

(A) 40 km/h

(B) 45 km/h

(C) 48 km/h

(D) 50 km/h

Q5. A dealer sells a pressure gauge for Rs. 1,080 and thereby earns a profit of 20%. The cost price of the gauge is: [1 mark]

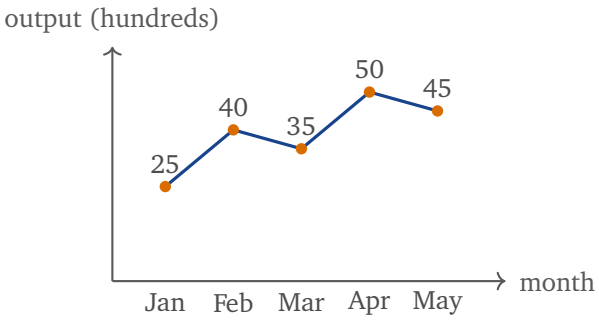
(A) Rs. 864

(B) Rs. 900

(C) Rs. 1,080

(D) Rs. 1,296

Q6. The line graph below shows the output of a workshop, in hundreds of units, for five consecutive months. The number of months in which the output was **strictly greater than the five-month average** is: **[2 marks]**



(A) 1

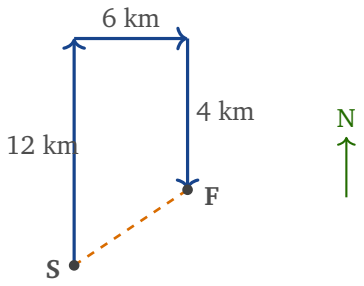
(B) 2

(C) 3

(D) 4

Analytical Aptitude

Q7. A surveyor starts from point **S** and walks 12 km towards the north. He then turns right and walks 6 km. He turns right once more and walks 4 km, and stops at point **F**. The distance of **F** from **S**, and the direction of **F** from **S**, are: **[2 marks]**



(A) 10 km, north-east of S

(B) 10 km, north-west of S

(C) 14 km, north-east of S

(D) 8 km, east of S

Q8. Five engineers **P, Q, R, S** and **T** sit in a row of five seats, all facing north. It is known that:

(i) T sits at the extreme right end of the row.
(ii) Exactly two people sit between P and T.
(iii) R sits immediately to the left of P.
(iv) S sits immediately to the right of P.

The engineer sitting in the middle seat of the row is: [2 marks]

(A) P

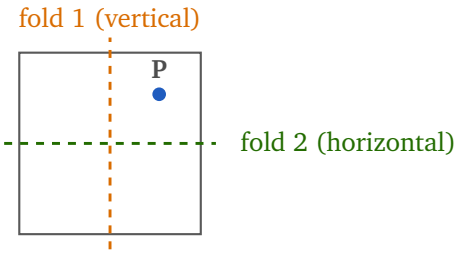
(B) S

(C) Q

(D) R

Spatial Aptitude

Q9. A square sheet of paper is folded **twice**, as shown below. **Fold 1:** the left half is folded onto the right half along the vertical dashed line. **Fold 2:** the resulting shape is folded again, bottom half onto top half, along the horizontal dashed line. A single hole is then punched straight through the folded packet at the point marked **P**. When the sheet is completely unfolded, the number of holes in it is: [2 marks]



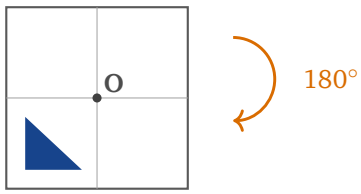
(A) 4

(B) 2

(C) 3

(D) 8

Q10. The transparent square sheet below is divided into four quadrants by the two faint lines, and carries an opaque shaded marker in its **bottom-left** quadrant. The sheet is rotated **180 degrees** in its own plane about the centre marked **O**. After the rotation the marker lies in the: **[2 marks]**



(A) Bottom-left quadrant

(B) Bottom-right quadrant

(C) Top-right quadrant

(D) Top-left quadrant

Detailed Solutions

Q1.

Solution

Concept – a preposition is chosen by the word it attaches to, not by the meaning of the sentence: The verb *work* takes a different preposition depending on what follows it, so the fix is to ask what kind of noun sits in the blank.

Step 1 – identify the verb: The verb phrase is *has been working*. The blank sits immediately after it.

Step 2 – identify the noun after the blank: The noun is *the revised layout*. That is a **task or piece of work**, not a place, not a field and not an employer.

Step 3 – recall the four fixed patterns of "work": work **on** a task or project; work **at** a place; work **in** a field or a department; work **for** an employer or for a stretch of time.

Step 4 – match the noun to the pattern: A revised layout is a task, so the pattern needed is *work on a task*. The preposition is **on**.

Step 5 – read the finished sentence back: "The design team has been working **on** the revised layout since Monday." This is natural and correct.

Why the other options are wrong:

- A, at: fits a **location**, as in "she works at the Pune plant". The misconception is treating a project like a place.
- C, in: fits a **field or department**, as in "he works in structural design". A layout is a specific deliverable, not a field.
- D, for: fits an **employer** ("works for the contractor") or a **duration** ("worked for three hours"). Here the noun is neither.

Final Answer: on $\Rightarrow$ B

Answer: (B) Go Back to Q1

Q2.

Solution

Concept – an analogy is solved by naming the RELATION in words first: Once the relation between the first pair is stated as a sentence, the second pair only has to satisfy the same sentence.

Step 1 – define the first word: *Ductile* describes a material that can be **drawn**

out under tension without breaking.

Step 2 – state the relation of the first pair: A ductile material is drawn into a **wire**. So the relation is: "this property lets the material be shaped into this specific product".

Step 3 – define the third word: *Malleable* describes a material that can be **hammered or rolled flat** under compression without cracking.

Step 4 – apply the same relation: Hammering or rolling a malleable material flat produces a thin flat product, that is a **sheet**. Gold leaf and rolled steel plate are the standard examples.

Step 5 – confirm the pairing is the textbook one: Materials engineering pairs the two properties exactly this way: ductility is measured by drawing into wire, malleability by beating into sheet. The analogy holds cleanly.

Why the other options are wrong:

- A, rod: a rod is thick and is produced by drawing, rolling or extrusion, so it belongs to the *ductile* side of the pair. It repeats the first relation instead of matching malleability.
- B, beam: a beam is a structural member defined by its **load-carrying role**, not by a forming property. The misconception is jumping to any engineering object rather than the product of the named process.
- C, coil: a coil is wire that has been wound up, so it is again the ductile product, one step further along.

Final Answer: sheet $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q2

Q3.

Solution

Concept – error spotting is done part by part, never by ear on the whole sentence: Check each part against one grammar rule at a time and stop at the part that breaks a rule.

Step 1 – check part A, "The engineer explained": Singular subject *engineer* with singular past-tense verb *explained*. Agreement and tense are both fine.

Step 2 – check part B, "that the failure occurred": *That* correctly introduces a reported clause after *explained*. *Occurred* is the correct past tense and is correctly spelt with the doubled r. Fine.

Step 3 – check part C, "because the bolt had been": *Because* correctly introduces the reason. *Had been* is the start of a past perfect passive, which is right: the tightening happened *before* the failure, so past perfect is the correct tense choice. Fine.

Step 4 – check part D, "tighten beyond its rated torque": Part C has set up *had been*, and *had been* must be completed by a **past participle** to form the passive. The word supplied is *tighten*, which is the base form of the verb, not a participle.

Step 5 – state the correction: The past participle of *tighten* is *tightened*. The part must read "**tightened** beyond its rated torque", giving "the bolt had been tightened beyond its rated torque".

Step 6 – name the underlying rule: In any perfect or passive construction the auxiliary *had been* is always followed by the third form of the verb. Using the base form is the error, and it sits in part D.

Why the other options are wrong:

- A: contains a correct singular subject-verb pair. Nothing here breaks a rule.
- B: uses the reporting conjunction *that* correctly and the simple past *occurred* correctly.
- C: is often marked wrong by candidates who think *had been* is an unnecessary tense shift. It is not. The tightening preceded the failure, so the past perfect is required. This is the intended trap.

Final Answer: Part D, "tighten" should be "tightened" $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q3

Q4.

Solution

Concept – average speed is TOTAL distance divided by TOTAL time: It is never the plain average of the two speeds, because the slower stretch takes longer and therefore carries more weight.

Step 1 – find the time for the first stretch: Time $= \dfrac{\text{distance}}{\text{speed}} = \dfrac{60}{30}$

$= 2$ hours

Step 2 – find the time for the second stretch: Time $= \dfrac{60}{60}$

$= 1$ hour

Step 3 – find the total time: Total time $= 2 + 1 = 3$ hours

Step 4 – find the total distance: Total distance $= 60 + 60 = 120$ km

Step 5 – divide: Average speed $= \dfrac{120}{3}$

$= 40$ km/h

Step 6 – sanity check the position of the answer: The train spends 2 of its 3 hours at 30 km/h and only 1 hour at 60 km/h. So the average must sit **closer to 30 than to 60**, and 40 does. Anything at or above 45 is immediately suspect.

Why the other options are wrong:

- B, 45 km/h: is the **plain arithmetic mean** $(30 + 60)/2$. This is the classic error. It would be correct only if equal *times* were spent at the two speeds, whereas here the equal quantity is distance.
- C, 48 km/h: has no valid derivation. It sits between 45 and 50 to catch anyone who feels 45 is slightly too low and nudges upward instead of computing.
- D, 50 km/h: comes from weighting the faster stretch more heavily, which is the exact opposite of what happens. The slower stretch occupies more of the clock, so it pulls the average down, not up.

Final Answer: 40 km/h $\Rightarrow$ A

Answer: (A) Go Back to Q4

Q5.

Solution

Concept – profit percentage is ALWAYS calculated on the cost price: The cost price is the base, so it is the unknown to solve for. It is never the selling price that gets the percentage applied to it.

Step 1 – write the relation: Selling price $=$ cost price $+$ profit

Step 2 – express the profit in terms of the cost price: Profit $= 20\%$ of cost price

$= \dfrac{20}{100} \times \text{CP} = 0.2\,\text{CP}$

Step 3 – substitute into Step 1: $\text{SP} = \text{CP} + 0.2\,\text{CP}$

$\text{SP} = 1.2\,\text{CP}$

Step 4 – put in the given selling price: $1080 = 1.2 \times \text{CP}$

Step 5 – solve for CP: $\text{CP} = \dfrac{1080}{1.2}$

$= \dfrac{10800}{12}$

$= 900$

Step 6 – verify by working forward: Profit $= 20\%$ of $900 = 180$

Selling price $= 900 + 180 = 1080$, which matches the figure given. So Rs. 900 is confirmed.

Why the other options are wrong:

- A, Rs. 864: comes from taking 20% **of the selling price** and subtracting it: $1080 - 216 = 864$. This applies the percentage to the wrong base. Checking it exposes the error at once: a cost of 864 sold at 1080 is a profit of 216 on 864, which is 25%, not 20%.
- C, Rs. 1,080: is the selling price copied straight down. It assumes zero profit and ignores the 20% entirely.
- D, Rs. 1,296: adds 20% *to* the selling price, 1080×1.2. Besides using the wrong base, it makes the cost price larger than the selling price, which would be a loss, contradicting the word "profit" in the question.

Final Answer: Rs. 900 $\Rightarrow$ B

Answer: (B) Go Back to Q5

Q6.

Solution

Concept – a "how many are above average" question is two jobs, not one: First compute the average of all the data, then compare every single reading against that one number. The average must come from all five months, not from a short-cut.

Step 1 – read the five values off the line graph: Jan $= 25$, Feb $= 40$, Mar $= 35$, Apr $= 50$, May $= 45$ (all in hundreds of units).

Step 2 – add them up, one operation per line: $25 + 40 = 65$

$65 + 35 = 100$

$100 + 50 = 150$

$150 + 45 = 195$

Total $= 195$ hundred units.

Step 3 – divide by the number of months: Average $= \dfrac{195}{5}$

$= 39$ hundred units.

Step 4 – compare each month against 39: Jan: $25 < 39$, so no.

Feb: $40 > 39$, so yes.

Mar: $35 < 39$, so no.

Apr: $50 > 39$, so yes.

May: $45 > 39$, so yes.

Step 5 – count the "yes" months: Feb, Apr and May clear the average. That is **3** months.

Step 6 – check the count is plausible: An average always has at least one value on each side unless every value is equal. Here 2 months lie below and 3 lie above, and $2 + 3 = 5$, which accounts for all the months. The split is consistent.

Why the other options are wrong:

- A, 1: counts only the **highest** month, April. The question asks how many beat the average, not which month is the peak.
- B, 2: comes from using the **median instead of the mean**. Sorted, the five values are 25, 35, 40, 45, 50, so the median is 40. Counting only what is strictly above 40 gives Apr and May, that is 2. The median is not the average, and Feb at 40 is genuinely above the true average of 39.
- D, 4: compares every month against **January** (25) rather than against the average, which puts Feb, Mar, Apr and May all above the bar. Using the first data point as the baseline is a different question altogether.

Final Answer: 3 months $\Rightarrow$ C

Answer: (C) Go Back to Q6

Q7.

Solution

Concept – direction sense is coordinate geometry in disguise: Put the start at the origin, treat north as $+y$ and east as $+x$, and every leg becomes a simple addition. Never try to hold the picture in your head.

Step 1 – fix the origin and the initial heading: Let S be $(0, 0)$. The surveyor first faces **north**.

Step 2 – walk the first leg: 12 km north takes him from $(0, 0)$ to $(0, 12)$.

Step 3 – resolve the first turn: He is facing north and turns **right**. Right of north is **east**. He now faces east.

Step 4 – walk the second leg: 6 km east takes him from $(0, 12)$ to $(6, 12)$.

Step 5 – resolve the second turn: He is facing east and turns **right** again. Right of east is **south**. He now faces south.

Step 6 – walk the third leg: 4 km south takes him from $(6, 12)$ to $(6, 8)$. So F is the point $(6, 8)$.

Step 7 – find the net displacement components: Net eastward displacement $= 6 - 0 = 6$ km

Net northward displacement $= 12 - 4 = 8$ km

Step 8 – apply Pythagoras, one operation per line: $\text{SF}^2 = 6^2 + 8^2$

$= 36 + 64$

$= 100$

$\text{SF} = \sqrt{100} = 10$ km

Step 9 – read off the direction: F is 6 km east of S and 8 km north of S. Both components are positive, so F lies in the quadrant that is north and east of S. The direction is **north-east of S**.

Step 10 – check against the figure: The dashed line in the figure runs from S up and to the right, confirming that F sits above and to the right of S. A 6-8-10 right triangle is the standard 3-4-5 triple scaled by 2, which is a useful check that the arithmetic is clean.

Why the other options are wrong:

- B, 10 km north-west: gets the distance right but reverses the horizontal turn. It is what you get if the first "right" turn is taken as **west** instead of east, that is turning left. The distance is unaffected by the mistake, which is exactly why this option is dangerous.
- C, 14 km north-east: gets the direction right but **adds the two components**, $6 + 8 = 14$, instead of combining them with Pythagoras. Displacement is a straight line, not the sum of the legs.
- D, 8 km east of S: keeps only the northward component 8 as the distance and then mislabels it as a direction. It ignores the 6 km eastward offset in the distance and ignores the 8 km northward offset in the direction.

Final Answer: 10 km, north-east of S $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q7

Q8.

Solution

Concept – start a linear arrangement from the clue that fixes an absolute position: Clues that name an end seat pin the row down. Relative clues such as "immediately to the left of" are then hung off that fixed point.

Step 1 – set up the seats: Number the seats 1 to 5 from left to right. Everybody faces north, so from our reading direction "left" means a lower seat number and "right" means a higher one. This matters: had they faced south, the two would swap.

Step 2 – apply clue (i): T sits at the extreme right, so **T is in seat 5**.

Row so far: _, _, _, _, T

Step 3 – apply clue (ii): Exactly two people sit between P and T. T is in seat 5, so the two people between must be in seats 3 and 4, which forces **P into seat 2**.

Row so far: _, P, _, _, T

Step 4 – apply clue (iii): R sits immediately to the left of P. P is in seat 2, so **R is in seat 1**.

Row so far: R, P, _, _, T

Step 5 – apply clue (iv): S sits immediately to the right of P. P is in seat 2, so **S is in seat 3**.

Row so far: R, P, S, _, T

Step 6 – place the last person: Only Q is left, and only seat 4 is empty, so **Q is in seat 4**.

Final row: **R, P, S, Q, T** in seats 1 to 5.

Step 7 – verify every clue against the final row: (i) T is in seat 5, the extreme right. Satisfied.

(ii) P is in seat 2 and T is in seat 5, so seats 3 and 4 lie between them, holding S and Q, exactly two people. Satisfied.

(iii) R in seat 1 is immediately left of P in seat 2. Satisfied.

(iv) S in seat 3 is immediately right of P in seat 2. Satisfied.

Step 8 – answer the question asked: The middle seat of a row of five is seat 3. Seat 3 holds **S**.

Why the other options are wrong:

- A, P: is in seat 2, not seat 3. This is what you get by counting "two people between P and T" as two *seats* of gap in the wrong direction, or by treating

P as the anchor of the row.

- C, Q: is in seat 4. Q is the only person with no direct clue, so it is tempting to drop Q into the leftover middle seat before clue (iv) has been applied. Clue (iv) fills seat 3 with S first, pushing Q to seat 4.
- D, R: is in seat 1. This is the answer you reach if "immediately to the left of P" is misread as "immediately to the right", which would send R to seat 3 and S to seat 1. The misconception is flipping the left-right convention for a row that faces north, where no flip is needed.

Final Answer: S sits in the middle $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q8

Q9.

Solution

Concept – a punch cuts one hole per LAYER of paper it passes through: So the whole question reduces to counting the layers sitting under the punch, and folds are what create layers.

Step 1 – count the folds: The sheet is folded **twice**: once vertically (left half onto right half), then once horizontally (bottom half onto top half).

Step 2 – track the layers through fold 1: Before any fold the sheet is 1 layer thick.

The vertical fold puts the left half exactly on top of the right half, so the packet is now $1 \times 2 = $ **2 layers** thick.

Step 3 – track the layers through fold 2: The horizontal fold puts the bottom of that 2-layer packet exactly on top of its top half.

The packet is now $2 \times 2 = $ **4 layers** thick.

Step 4 – confirm the punch goes through all four layers: Point P lies in the **top-right** quadrant of the original sheet. Fold 1 brings the left half over onto the right half, and fold 2 brings the bottom over onto the top, so the top-right quadrant is the quadrant that ends up on the outside of the finished packet, with the other three quadrants stacked beneath it. P therefore sits over all 4 layers and the punch passes through every one.

Step 5 – count the holes on unfolding: 4 layers punched once gives **4 holes**. Their positions are P itself, the mirror image of P about the vertical fold line, the mirror image of P about the horizontal fold line, and the point diagonally opposite P through the centre.

Step 6 – state the general rule: n folds give 2^n layers, hence 2^n holes from a

single punch, provided the punch lies over the full stack. So 1 fold gives 2, 2 folds give 4, 3 folds give 8. The count always doubles, and the holes always come out symmetric about the fold lines.

Why the other options are wrong:

- B, 2: is the answer for **one** fold, $2^1 = 2$. The misconception is counting only the fold that is most visible in the diagram and missing that the question specifies two.
- C, 3: comes from **adding** one hole per fold, $1+1+1 = 3$, instead of doubling the layers. Layers multiply, they do not accumulate one at a time, so an odd count above one can never arise from folding.
- D, 8: is 2^3, the answer for **three** folds. It over-applies the doubling rule by one step.

Final Answer: $4 \Rightarrow$ A

Answer: (A) Go Back to Q9

Q10.

Solution

Concept – a 180 degree rotation sends every point to the point diagonally opposite through the centre: This is the one rotation where the direction of the turn does not matter, because clockwise and anticlockwise both land in the same place.

Step 1 – fix the starting position: The shaded marker occupies the **bottom-left** quadrant.

Step 2 – work out where a 180 degree turn sends each quadrant: A half turn about O reverses both directions at once: left becomes right, and bottom becomes top. So:

bottom-left $\rightarrow$ top-right

top-right $\rightarrow$ bottom-left

bottom-right $\rightarrow$ top-left

top-left $\rightarrow$ bottom-right

Each quadrant swaps with the one diagonally across from it.

Step 3 – apply it to the marker: The marker starts in the bottom-left quadrant, so it lands in the **top-right** quadrant.

Step 4 – confirm with coordinates: Put O at the origin. A point in the bottom-

left quadrant has coordinates of the form $(-x, -y)$ with $x, y > 0$. A 180 degree rotation maps $(x, y) \to (-x, -y)$, so it sends $(-x, -y) \to (+x, +y)$. Both signs flip to positive, which is the top-right quadrant. This confirms Step 3.

Step 5 – confirm physically: Turn the page upside down and watch the bottom-left corner. It travels through the centre and comes to rest exactly where the top-right corner used to be.

Step 6 – note why the turn direction is irrelevant here: Two clockwise quarter turns and two anticlockwise quarter turns both add up to a half turn, and both put the marker in the same quadrant. So unlike a 90 degree question, there is no clockwise or anticlockwise trap to fall into. The only real trap is doing 90 degrees when 180 was asked.

Why the other options are wrong:

- A, bottom-left: is the starting position. It corresponds to no rotation at all, or to a full 360 degree turn. It is also the trap for anyone who reads 180 degrees as flipping the sheet over about a line rather than rotating it in its own plane.
- B, bottom-right: is where the marker lands after a **90 degree anticlockwise** rotation. The misconception is doing a single quarter turn instead of a half turn.
- D, top-left: is where the marker lands after a **90 degree clockwise** rotation. It is the mirror-image version of the same quarter-turn error.

Final Answer: Top-right quadrant $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q10

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	D	3	D	4	A	5	B
6	C	7	A	8	B	9	A	10	C