GATE General Aptitude

Sample Paper – 2

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. Select the word that correctly fills the blank.

The revised firing schedule had no measurable _____ on the kiln's output. [1 mark]

(A) affect

(B) affected

(C) effecting

(D) effect

Q2. The committee decided to **call off** the trial run after the vibration sensor failed. In this sentence, *call off* most nearly means: [1 mark]

(A) Postpone to a later date

(B) Supervise closely

(C) Cancel

(D) Announce publicly

Q3. Read the passage below and answer the question that follows.

Carbon fibre composites are valued in aircraft design because they are both light and stiff. Unlike aluminium, however, they do not visibly dent when struck. A spanner dropped on a composite panel can leave the outer surface almost unmarked while separating the layers underneath it. Airlines therefore inspect composite structures with ultrasound rather than by eye alone.

Which one of the following can be **inferred** from the passage? [1 mark]

(A) A composite panel can be damaged even when its surface looks undamaged.

(B) Carbon fibre composites are stronger than aluminium in every respect.

(C) Ultrasound has replaced all visual inspection of aircraft.

(D) An aluminium panel needs no inspection after a spanner is dropped on it.

Quantitative Aptitude

Q4. Pipe A alone fills an empty tank in 12 minutes and pipe B alone fills the same tank in 18 minutes. If both pipes are opened together on the empty tank, the time taken to fill it is: [1 mark]

(A) 6 minutes

(B) 7 minutes 12 seconds

(C) 7 minutes 20 seconds

(D) 15 minutes

Q5. A sum of Rs. 20,000 is invested for 2 years at 10% per annum. The compound interest (compounded annually) exceeds the simple interest by: [1 mark]

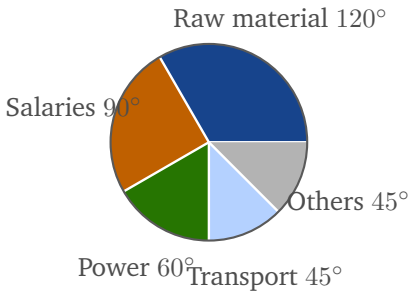
(A) Rs. 20

(B) Rs. 200

(C) Rs. 400

(D) Rs. 4,200

Q6. The pie chart below shows how a factory's total annual expenditure of **Rs. 7,200 lakh** is divided among five heads, with each sector marked by its central angle. The amount spent on **raw material** exceeds the amount spent on **power** by: [2 marks]



(A) Rs. 1,200 lakh

(B) Rs. 900 lakh

(C) Rs. 2,400 lakh

(D) Rs. 60 lakh

Analytical Aptitude

Q7. Pointing to a boy, Ravi said, "He is the son of the only son of my grandfather's only child." How is the boy related to Ravi? [2 marks]

(A) His brother

(B) His nephew

(C) His cousin

(D) His son

Q8. In the series below, one term is missing. The missing term is:

5, 11, 23, 47, ____, 191 [2 marks]

(A) 95

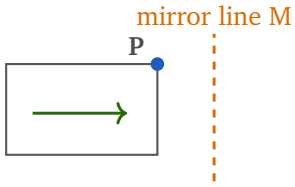
(B) 94

(C) 96

(D) 71

Spatial Aptitude

Q9. The figure below shows a rectangle placed to the left of the vertical dashed **mirror line M**. A dot **P** marks one corner of the rectangle, and an arrow inside it points towards the mirror. In the mirror image of this figure, the dot **P** lies at the _____ corner of the rectangle and the arrow points _____. [2 marks]



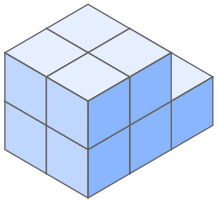
(A) top-right corner, and the arrow points right

(B) bottom-left corner, and the arrow points left

(C) top-left corner, and the arrow points left

(D) bottom-right corner, and the arrow points right

Q10. The figure below shows a stack built entirely from identical unit cubes. The total number of unit cubes in the stack, **including any cube that cannot be seen**, is: [2 marks]



(A) 9

(B) 10

(C) 12

(D) 8

Detailed Solutions

Q1.

Solution

Concept – when two similar words compete, decide the PART OF SPEECH first: *Affect* and *effect* sound almost the same, so the sentence itself must tell you which one belongs. Ask what grammatical slot the blank is, and only one of the two survives.

Step 1 – separate the two words by their usual role: *Affect* is normally a **verb** meaning to influence something. *Effect* is normally a **noun** meaning the result or influence produced.

Step 2 – look at the word just before the blank: The blank follows "no measurable". *Measurable* is an adjective.

Step 3 – work out what an adjective must modify: An adjective modifies a **noun**. So the blank has to be filled by a noun.

Step 4 – look at the word just after the blank: The blank is followed by "on the kiln's output". The fixed phrase in English is "an effect *on* something". A verb here would need no preposition, as in "it affected the output".

Step 5 – pick the noun: Of the four options, only *effect* is a noun. So the sentence reads: The revised firing schedule had no measurable **effect** on the kiln's output.

Why the other options are wrong:

- A, affect: is the **verb** to influence. This is the classic affect/effect swap. The sentence already has its verb, "had", so a second verb cannot sit after the adjective "measurable".
- B, affected: is the past tense of the same verb. "Had no measurable affected" is not a possible English structure at all.
- C, effecting: uses the rare verb *to effect*, which means to bring about. Even taken as a gerund it keeps a verb's sense of causing, and it cannot be modified by "measurable" the way a plain noun can.

Final Answer: effect $\Rightarrow$ D

Answer: (D) Go Back to Q1

Q2.

Solution

Concept – a phrasal verb is fixed, so read the whole two-word unit: The meaning of *call off* is not the meaning of *call* plus the meaning of *off*. Treat the pair as one word and confirm the meaning against the sentence.

Step 1 – state the standard meaning: *Call off* means to cancel something that had been arranged, so that it does not happen at all.

Step 2 – test it in the sentence: "The committee decided to **cancel** the trial run after the vibration sensor failed." This reads naturally and makes engineering sense.

Step 3 – check the logic of the situation: A vibration sensor is the instrument that would record whether the run is safe. With the sensor dead, the run would produce no usable data and could not be monitored. Scrapping it is the sensible action.

Step 4 – confirm the word class: *Call off* here takes a direct object, "the trial run". *Cancel* also takes a direct object, so the substitution is grammatically clean.

Why the other options are wrong:

- A, postpone to a later date: is the meaning of *put off*, not *call off*. This is the intended trap. *Call off* kills the event; *put off* only moves it. The sentence gives no new date, and a failed sensor is a reason to stop, not merely to reschedule.
- B, supervise closely: confuses *call off* with *look after* or *oversee*. Nothing in *call off* carries a sense of watching over.
- D, announce publicly: reads *call off* as *call out*, that is, reading names aloud from a list. Those are two different phrasal verbs with different particles.

Final Answer: Cancel ⇒ C

Answer: (C) Go Back to Q2

Q3.

Solution

Concept – an inference must be forced by the passage, nothing more: A valid inference is a statement the passage guarantees. Anything that adds new strength, new scope or a new claim is not an inference, however reasonable it sounds.

Step 1 – list what the passage actually states: Composites are light and stiff. They do not visibly dent when struck. A dropped spanner can leave the surface

almost unmarked while separating the layers underneath. Airlines inspect composites with ultrasound rather than by eye alone.

Step 2 – find the sentence that carries the hidden point: "Leave the outer surface almost unmarked while separating the layers underneath it" puts two facts side by side: the surface looks fine, and yet the material below has come apart.

Step 3 – name what that means: Separated layers are damage. An unmarked surface is what the eye sees. So damage can exist while the surface still looks intact. That is exactly option A.

Step 4 – check that the last sentence supports it: Airlines would have no reason to buy ultrasound equipment if the eye were enough. The switch to ultrasound is only rational if invisible damage is real, which confirms Step 3.

Step 5 – confirm nothing extra was assumed: Option A adds no number, no comparison and no new claim. It just restates what the third sentence forces. It is a safe inference.

Why the other options are wrong:

- B, stronger in every respect: over-generalises. The passage praises composites only for being light and stiff, and then describes a weakness of theirs, that damage hides. "Every respect" is a scope the passage never grants. This is the classic too-strong distractor.
- C, ultrasound has replaced all visual inspection: misreads "rather than by eye **alone**". The word *alone* means ultrasound is used in addition to the eye, not instead of it. Dropping one word reverses the meaning.
- D, aluminium needs no inspection: is never claimed. The passage says only that aluminium *does* dent visibly. That makes its damage easier to spot, which is an argument for looking, not for skipping the check.

Final Answer: Option A $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q3

Q4.

Solution

Concept – work questions are solved with RATES, never with times: Times cannot be added, but rates can. Give the tank a convenient size in units, convert each pipe's time into units per minute, add the rates, then divide back.

Step 1 – choose the tank's capacity: Take the capacity as the LCM of 12 and 18.

LCM of 12 and 18 $= 36$ units

Step 2 – find pipe A's rate: Rate of A $= \dfrac{36}{12}$

$= 3$ units per minute

Step 3 – find pipe B's rate: Rate of B $= \dfrac{36}{18}$

$= 2$ units per minute

Step 4 – add the rates: Combined rate $= 3 + 2$

$= 5$ units per minute

Step 5 – convert the combined rate back into a time: Time $= \dfrac{\text{capacity}}{\text{combined rate}} = \dfrac{36}{5}$

$= 7.2$ minutes

Step 6 – turn the decimal part into seconds: Whole minutes $= 7$

Decimal part $= 0.2$ minute

$0.2 \times 60 = 12$ seconds

Time $= 7$ minutes 12 seconds

Step 7 – sanity check the size of the answer: Two pipes together must beat the faster pipe acting alone, so the answer must be less than 12 minutes. It must also be more than half of 12, which is 6 minutes, because the slower pipe is not as fast as the quicker one. And $6 < 7.2 < 12$, so the answer sits exactly where it should.

Why the other options are wrong:

- A, 6 minutes: comes from subtracting the times, $18 - 12 = 6$. Subtraction has no meaning here, and 6 minutes is the absolute floor the pair could never reach even if both pipes were as fast as A.
- C, 7 minutes 20 seconds: is the right value of 7.2 minutes spoiled at the last step. It reads the ".2" as 20 seconds instead of converting it, that is, it treats a decimal minute as if minutes had 100 seconds.
- D, 15 minutes: averages the two times, $\dfrac{12 + 18}{2} = 15$. This is the central misconception of the topic. Averaging times says the pair is **slower** than pipe A alone, which is impossible when a second pipe is helping.

Final Answer: 7 minutes 12 seconds $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q4

Q5.

Solution

Concept – CI beats SI only because interest itself starts earning interest: Simple interest is charged on the original sum every year. Compound interest is charged on the sum plus whatever interest has already piled up. Over 2 years the whole gap is just one year's interest on the first year's interest.

Step 1 – write down the given data: Principal $P = \text{Rs. } 20{,}000$

Rate $r = 10\%$ per annum

Time $n = 2$ years

Step 2 – compute the simple interest: $\text{SI} = \dfrac{P \times r \times n}{100} = \dfrac{20000 \times 10 \times 2}{100}$

$= \dfrac{400000}{100}$

$= \text{Rs. } 4{,}000$

Step 3 – compute the first year's compound interest: Interest in year 1 $= 20000 \times \dfrac{10}{100} = \text{Rs. } 2{,}000$

Amount at the end of year 1 $= 20000 + 2000 = \text{Rs. } 22{,}000$

Step 4 – compute the second year's compound interest: Interest in year 2 is charged on Rs. 22,000, not on Rs. 20,000.

Interest in year 2 $= 22000 \times \dfrac{10}{100} = \text{Rs. } 2{,}200$

Amount at the end of year 2 $= 22000 + 2200 = \text{Rs. } 24{,}200$

Step 5 – extract the compound interest: $\text{CI} = 24200 - 20000$

$= \text{Rs. } 4{,}200$

Step 6 – take the difference: $\text{CI} - \text{SI} = 4200 - 4000$

$= \text{Rs. } 200$

Step 7 – check with the standard 2-year formula: Difference $= P\left(\dfrac{r}{100}\right)^2 =$

$20000 \times \left(\dfrac{10}{100}\right)^2$

$= 20000 \times 0.01$

$= \text{Rs. } 200$

Both routes agree.

Step 8 – read the meaning of the 200: The first year's interest was Rs. 2,000. Under CI that Rs. 2,000 earns 10% for one further year, which is $2000 \times 0.10 = \text{Rs. } 200$. Under SI it earns nothing. That single amount is the entire gap.

Why the other options are wrong:

- A, Rs. 20: comes from an algebraic slip in the formula, writing $\frac{Pr}{100^2}$ instead of $P\left(\frac{r}{100}\right)^2$. That gives $\frac{20000 \times 10}{10000} = 20$. The rate must be squared along with its own 100.
- C, Rs. 400: charges interest on the first year's interest for **both** years, $2000 \times 0.10 \times 2 = 400$. But the first year's interest only exists from the end of year 1, so it can earn for one year only, not two.
- D, Rs. 4,200: is the compound interest itself. The question asks by how much CI exceeds SI, which is a difference, not the CI figure.

Final Answer: Rs. 200 $\Rightarrow$ B

Answer: (B) Go Back to Q5

Q6.

Solution

Concept – in a pie chart the whole circle is 360 degrees and it stands for the whole total: So every sector's value is $\frac{\text{its angle}}{360} \times$ total. A degree is never a rupee and never a percent until you scale it.

Step 1 – check that the chart is complete: $120 + 90 + 60 + 45 + 45$

$= 210 + 60 + 45 + 45$

$= 360^\circ$

The five sectors account for the full circle, so the whole Rs. 7,200 lakh is covered.

Step 2 – find what one degree is worth: Value of $1^\circ = \frac{7200}{360}$

$= 20$ lakh per degree

Step 3 – find the raw material spend: Raw material $= 120 \times 20$

$=$ Rs. 2,400 lakh

Step 4 – find the power spend: Power $= 60 \times 20$

$=$ Rs. 1,200 lakh

Step 5 – take the difference: Excess $= 2400 - 1200$

$=$ Rs. 1,200 lakh

Step 6 – verify by working with the angle gap directly: Angle gap $= 120 - 60 = 60^\circ$

Excess $= \frac{60}{360} \times 7200 = \frac{1}{6} \times 7200 =$ Rs. 1,200 lakh

Both routes agree.

Step 7 – sanity check the size: Raw material at $120°$ is exactly twice power at $60°$. So the excess must equal the power spend itself, which is Rs. 1,200 lakh. The answer is consistent.

Why the other options are wrong:

- B, Rs. 900 lakh: uses the **wrong pair** of sectors. It is salaries minus transport, $(90 - 45) \times 20 = 900$. The question names raw material and power.
- C, Rs. 2,400 lakh: is the raw material spend on its own. It forgets to subtract the power spend, answering "how much on raw material" instead of "by how much does it exceed power".
- D, Rs. 60 lakh: treats the **degrees as the answer**, reading the $60°$ angle gap straight off as Rs. 60 lakh. An angle only becomes money after it is multiplied by the total and divided by 360.

Final Answer: Rs. 1,200 lakh $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q6

Q7.

Solution

Concept – unwrap a blood relation from the INSIDE out: Start at the innermost phrase, name the person it points to, then substitute that name back and take the next layer. Every word like *only* is a hard constraint, not decoration.

Step 1 – write the statement in layers: The boy is the son of (the only son of (my grandfather's only child)).

Step 2 – resolve the innermost layer: "My grandfather's only child" is Ravi's grandfather's single child. A grandfather's child who is in Ravi's line of descent is Ravi's parent. Since that child is the *only* child, Ravi's parent has no brother and no sister.

Innermost layer = Ravi's parent.

Step 3 – substitute and resolve the next layer: "The only son of my grandfather's only child" becomes "the only son of Ravi's parent".

Step 4 – identify that son: Ravi is male, and Ravi is a son of his own parent. The phrase says that parent has **only one** son. So that one son can be nobody but Ravi himself.

Middle layer = Ravi.

Step 5 – resolve the outermost layer: "The boy is the son of (Ravi)".

So the boy is Ravi's son.

Step 6 – read the relation in the asked direction: The question asks how the boy is related to Ravi. The boy is **his son**.

Step 7 – check the two constraints once more: "Only child" removes any uncle or aunt for Ravi, so no cousin branch exists. "Only son" removes any brother for Ravi. Both words were needed, and both are now used.

Why the other options are wrong:

- A, his brother: would mean the boy is another child of Ravi's parent, but the statement says the boy is that son's **son**, one generation lower. It reads "son of the only son" as "the only son", dropping a whole generation.
- B, his nephew: needs the "only son" in the middle layer to be a brother of Ravi's. That is impossible, because the parent is stated to have only one son and Ravi is already that son.
- C, his cousin: needs Ravi's grandfather to have at least two children, so that a second branch of the family exists. The word **only** in "only child" rules that out completely.

Final Answer: His son $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q7

Q8.

Solution

Concept – a series is cracked by testing differences first, then ratios: Look for one rule that fits *every* consecutive pair, and confirm it on the terms that sit on both sides of the gap.

Step 1 – write out the terms with the gap: $5,\ 11,\ 23,\ 47,\ ?,\ 191$

Step 2 – take the differences you can compute: $11 - 5 = 6$

$23 - 11 = 12$

$47 - 23 = 24$

Step 3 – read the pattern in those differences: $6,\ 12,\ 24$ is itself a doubling chain. So the next difference should be $24 \times 2 = 48$, and the one after that $48 \times 2 = 96$.

Step 4 – state the rule in a cleaner form: Check whether each term is twice the previous term plus one.

$5 \times 2 + 1 = 11$ ✓

$11 \times 2 + 1 = 23$ ✓

$23 \times 2 + 1 = 47$ ✓

The rule is "double and add 1".

Step 5 – apply the rule across the gap: Missing term $= 47 \times 2 + 1$

$= 94 + 1$

$= 95$

Step 6 – verify against the term after the gap: $95 \times 2 + 1 = 190 + 1 = 191$

The given last term is 191, so the rule holds on both sides of the gap. The missing term is confirmed as 95.

Step 7 – cross-check with the difference route: $47 + 48 = 95$, and $95 + 96 = 191$. Both methods land on the same number, so the answer is secure.

Why the other options are wrong:

- B, 94: applies only the doubling and **forgets the** $+1$, giving $47 \times 2 = 94$. It also fails the check on the far side: $94 \times 2 + 1 = 189$, not 191.
- C, 96: adds 2 instead of 1, giving $47 \times 2 + 2 = 96$. Then $96 \times 2 + 2 = 194$, which misses the given 191.
- D, 71: assumes the differences stay constant at 24 instead of doubling, giving $47 + 24 = 71$. That is the misconception of forcing an arithmetic progression on a series whose differences are clearly growing.

Final Answer: 95 $\Rightarrow$ A

Answer: (A) Go Back to Q8

Q9.

Solution

Concept – a vertical mirror flips LEFT and RIGHT only, and leaves UP and DOWN untouched: Handle the two directions separately. Anything that changes both directions at once is a rotation, not a reflection.

Step 1 – write the rule for a vertical mirror line: Horizontal position: reversed. What was on the left goes to the right, and what was on the right goes to the left.

Vertical position: unchanged. Top stays top, bottom stays bottom.

Step 2 – fix where P sits in the original: P is at the **top-right** corner of the rectangle, which is the corner nearest the mirror.

Step 3 – apply the vertical rule to P: P is at the top. Height is untouched by a

vertical mirror, so in the image P is still at the **top**.

Step 4 – apply the horizontal rule to P: P is at the right of its own rectangle. Left and right are reversed, so within the image rectangle P moves to the **left**.

Step 5 – combine the two: P lands at the **top-left** corner of the image rectangle.

Step 6 – check this against a physical fact about mirrors: The image rectangle appears to the right of the mirror. P was the corner closest to the mirror, and an image keeps every distance from the mirror. So P must still be the corner closest to the mirror, which for a rectangle on the right of the mirror is its left-hand side. That agrees with Step 5 and is a good way to self-check.

Step 7 – handle the arrow: The arrow points right, that is, towards the mirror. Horizontal direction reverses, so in the image it points **left**. Physically the image arrow also points back towards the mirror, which from the right-hand side means pointing left. The two checks agree.

Step 8 – read off the option: Top-left corner, arrow pointing left.

Why the other options are wrong:

- A, top-right and arrow right: is the original figure unchanged. This is the "mirror does nothing" error, and it also breaks the mirror check, since the arrow would then point away from the mirror instead of back towards it.
- B, bottom-left and arrow left: flips **both** directions. Reversing left-right and top-bottom together is a 180° rotation, not a reflection. The arrow happens to come out right, which is exactly why this option is tempting, but the corner gives it away.
- D, bottom-right and arrow right: flips only up and down. That is a reflection about a **horizontal** mirror line, not the vertical line M drawn in the figure. It is the misconception of reflecting across the wrong axis.

Final Answer: Top-left corner, arrow pointing left $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q9

Q10.

Solution

Concept – count a cube stack LAYER BY LAYER, from the bottom up: Never count faces you can see, because some cubes are buried. Work out the footprint of each horizontal layer instead, and the hidden cubes get counted automatically.

Step 1 – identify the bottom layer's footprint: The bottom layer is a solid rectangle of cubes, 3 cubes along the front-right direction and 2 cubes deep.

Step 2 – count the bottom layer: Bottom layer $= 3 \times 2$

$= 6$ cubes

Step 3 – identify the upper layer's footprint: The upper layer does not cover the whole base. It is a square block of cubes, 2 along and 2 deep, sitting flush at the back-left of the base. The right-hand column of the base is left uncovered, which is what makes the step visible in the figure.

Step 4 – count the upper layer: Upper layer $= 2 \times 2$

$= 4$ cubes

Step 5 – add the layers: Total $= 6 + 4$

$= 10$ cubes

Step 6 – find which cube is hidden, as a check: A cube is invisible only when something blocks all three directions you can see from: its left, its front and its top. The cube in the **back corner of the bottom layer, under the upper block**, has a cube to its left, a cube in front of it and a cube directly on top of it. It is completely buried.

Step 7 – reconcile the two counts: Cubes with at least one visible face $= 9$

Buried cubes $= 1$

Total $= 9 + 1 = 10$

This matches Step 5, so the layer count is confirmed.

Why the other options are wrong:

- A, 9: counts only the cubes that show a face and misses the single buried cube in the bottom layer. This is the exact misconception the question tests, since the figure can never show that cube.
- C, 12: assumes the solid is a full block, $3 \times 2 \times 2 = 12$. It ignores the step, that is, it wrongly fills in the two cubes above the uncovered right-hand column of the base.
- D, 8: keeps the base at 6 but counts the upper block as a single row of 2 instead of a 2×2 square, so it drops the two upper cubes at the back. It reads the depth of the top layer as one cube when the figure shows two.

Final Answer: 10 $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q10

Answer Key

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