

GATE General Aptitude

Sample Paper – 4

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

Most metal parts do not break because one load finally exceeds their strength. They break because millions of ordinary working cycles slowly extend a crack that started at a scratch, a weld defect or a tiny void. Each cycle adds a length far too small to see. The part behaves normally until the section left behind can no longer carry even the routine load, and then it parts in an instant. This is why inspection intervals, and not design margins alone, govern how long such a part stays safe in service.



The **main idea** of the passage is that:

[1 mark]

- (A) A scratch or a weld defect is the usual starting point of a crack in metal.
- (B) Metal parts break when a single load finally exceeds their design strength.
- (C) Design margins should be made larger so that metal parts survive millions of load cycles.
- (D) Metal parts fail through cracks that grow invisibly under repeated loading, so scheduled inspection rather than design margin alone keeps them safe.

Q2. Choose the option that completes the sentence with the **correct verb form**.

By the time the maintenance crew arrived, the pump _____ for nearly three hours.

[1 mark]

- (A) has been running
- (B) is running
- (C) had ran
- (D) had been running

Q3. Read the sentence below.

*The safety audit was **perfunctory**: the inspector signed the form without once opening the control panel.*

As used in this sentence, *perfunctory* means:

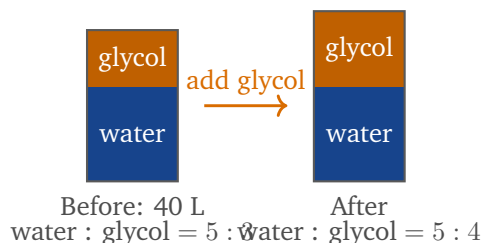
[1 mark]

- (A) Unusually thorough
- (B) Carried out without proper authority
- (C) Done as a routine duty, with minimal care or interest
- (D) Delayed beyond the scheduled date

Quantitative Aptitude



- Q4.** A vessel holds **40 litres** of a coolant mixture in which water and glycol are in the ratio **5 : 3**. Glycol alone is now added, and nothing is removed, until the ratio of water to glycol becomes **5 : 4**. The volume of glycol added, in litres, is: [1 mark]



- (A) 4
(B) 5
(C) 6
(D) 8
- Q5.** The annual output of a plant grew by **20%** during the first year and by a further **25%** during the second year. The overall growth in output over the two years taken together is: [1 mark]
- (A) 50%
(B) 45%
(C) 22.5%
(D) 44%
- Q6.** The table below shows, for four plants of a company, the number of units produced in a month and the number of those units rejected at final inspection. The plant with the **highest percentage of units rejected** is: [2 marks]

Plant	Units produced	Units rejected
P	1200	48
Q	800	44
R	1500	60
S	500	26

- (A) P



- (B) Q
- (C) R
- (D) S

Analytical Aptitude

Q7. Read the two statements and the two conclusions below.

Statements:

- I. All sensors supplied by vendor X are calibrated before dispatch.
- II. Some sensors in the laboratory are not calibrated.

Conclusions:

- I. Some sensors in the laboratory were not supplied by vendor X.
- II. No sensor in the laboratory was supplied by vendor X.

Which of the conclusions follows from the statements? [2 marks]

- (A) Only conclusion II follows
- (B) Only conclusion I follows
- (C) Both conclusion I and conclusion II follow
- (D) Neither conclusion I nor conclusion II follows

Q8. In a certain code, **ROD** is written as **54-45-12** and **PIN** is written as **48-27-42**. In the same code, **DIG** will be written as: [2 marks]

- (A) 12-27-21
- (B) 12-27-18
- (C) 8-18-14
- (D) 21-27-12

Spatial Aptitude

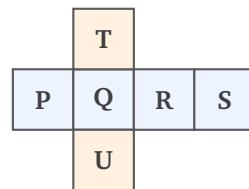
Q9. The first four figures of a sequence are shown below. The figure that **continues** the sequence in the fifth position is: [2 marks]





- (A) A hexagon containing 5 dots
- (B) A heptagon (7 sides) containing 4 dots
- (C) A heptagon (7 sides) containing 5 dots
- (D) An octagon (8 sides) containing 5 dots

Q10. The figure below is the **net** of a cube: the six squares are marked **P**, **Q**, **R**, **S**, **T** and **U**. When the net is folded along the common edges to close the cube, the face that lies **opposite** the face marked **Q** is: [2 marks]



net of a cube (not to scale)

- (A) S
- (B) R
- (C) T
- (D) U



Detailed Solutions**Q1.****Solution**

Concept – the main idea is what the whole passage is built to say: It must cover the passage from end to end. A statement that is true of only one sentence is a supporting detail, not the main idea, and a statement the passage never makes is out regardless of how sensible it sounds.

Step 1 – read what the first sentence rules out: It says metal parts do *not* usually break because one load exceeds their strength. So the passage opens by rejecting a common belief.

Step 2 – read what the passage puts in its place: Failure comes from millions of ordinary working cycles that slowly extend a crack. This is the mechanism the passage is arguing for.

Step 3 – note the property the passage stresses about that mechanism: Each cycle adds a length far too small to see, and the part behaves normally right up to the break. The damage is real but invisible.

Step 4 – read the last sentence, which carries the point: Because the damage is invisible, inspection intervals and not design margins alone govern how long the part stays safe. The word "this is why" marks it as the conclusion the earlier sentences were leading to.

Step 5 – join Steps 2 to 4 into one statement: Cracks grow invisibly under repeated loading, therefore scheduled inspection, not design margin alone, is what keeps the part safe. That is exactly option D, and it is the only option that carries both halves of the argument.

Why the other options are wrong:

- A, a scratch or weld defect is the usual starting point: is **true but too narrow**. It reports one clause of the second sentence. This is the classic detail-as-main-idea distractor: correct information promoted above its rank.
- B, parts break when a single load exceeds design strength: **contradicts** the opening sentence, which exists specifically to deny this. It catches a reader who skims the first line and takes the belief being rejected as the belief being taught.
- C, design margins should be made larger: is a **distortion**. The passage says margins alone are not sufficient; it never recommends increasing them. Swapping "not sufficient by itself" for "should be increased" is a different claim, and the passage's actual remedy is inspection.



Final Answer: Option D $\Rightarrow$ D

Answer: (D) [Go Back to Q1](#)

Q2.

Solution

Concept – an action that ran for a stretch of time up to a point in the PAST takes the past perfect continuous: The form is *had been* + verb+ing. Two clues in the sentence force it, and both must be honoured.

Step 1 – find the reference point in time: "By the time the maintenance crew arrived" fixes a moment in the **past**. Everything in the blank must be dated relative to that past moment, not to now.

Step 2 – find the duration clue: "for nearly three hours" gives a stretch of time, not a single instant. That calls for a **continuous** form.

Step 3 – combine the two clues: Earlier than a past point $\Rightarrow$ past **perfect**. Ran for a stretch $\Rightarrow$ **continuous**. Together they give the past perfect continuous: *had been running*.

Step 4 – read the finished sentence back: "By the time the maintenance crew arrived, the pump had been running for nearly three hours." The pump started three hours before the crew reached it and was still running as they arrived. That is exactly the meaning intended.

Why the other options are wrong:

- A, has been running: is the **present** perfect continuous, which measures a stretch running up to *now*. It clashes with "arrived", which has already placed the sentence in the past. The misconception is treating "for three hours" as reason enough for the present perfect, ignoring the tense of the main clause.
- B, is running: is the present continuous, which places the running in the present moment. The sentence is entirely in the past, so the two clauses would not agree.
- C, had ran: is not a valid form. The past participle of *run* is **run**, not *ran*, so the perfect tense would have to be *had run*. Even after that repair, *had run* is a simple perfect and loses the sense of an activity still in progress when the crew arrived.

Final Answer: had been running $\Rightarrow$ D

Answer: (D) [Go Back to Q2](#)



Q3.

Solution

Concept – "as used in this sentence" means the context decides: Do not answer from a half-remembered dictionary entry. Read what the rest of the sentence shows the word doing, then pick the option that matches that behaviour.

Step 1 – read the evidence the sentence gives: The inspector "signed the form without once opening the control panel". He went through the motion that produced the paperwork and skipped the part that produced the knowledge.

Step 2 – describe that behaviour in plain words: The audit was done, but only as a formality. It was carried out mechanically, to discharge a duty, with no real care or interest in the result.

Step 3 – match that description to the word: *Perfunctory* means precisely this: performed as a routine duty, superficially and without enthusiasm. The colon in the sentence is itself a signal, since it introduces the clause that illustrates the word.

Step 4 – confirm against the options: Option C states "done as a routine duty, with minimal care or interest", which is the same description arrived at in Step 2.

Why the other options are wrong:

- A, unusually thorough: is the **opposite** of what the sentence shows. An inspector who never opened the panel was not thorough. This option catches anyone who assumes a long, formal-sounding word must be a compliment.
- B, carried out without proper authority: confuses *perfunctory* with *unauthorised*. The sentence questions the **quality** of the audit, not the inspector's right to conduct it. Nothing suggests he was not entitled to sign.
- D, delayed beyond the scheduled date: brings in timing, which the sentence never mentions. The complaint is about how the audit was done, not about when.

Final Answer: Done as a routine duty, with minimal care or interest ⇒ C

Answer: (C) [Go Back to Q3](#)



Q4.

Solution

Concept – when only one ingredient is added, the OTHER ingredient is unchanged: Convert the starting ratio into actual litres, hold the untouched quantity fixed, and use it as the anchor for the new ratio.

Step 1 – split the 40 litres in the ratio 5 : 3: Total parts = $5 + 3 = 8$

Value of one part = $\frac{40}{8} = 5$ litres

Step 2 – find each quantity: Water = $5 \times 5 = 25$ litres

Glycol = $3 \times 5 = 15$ litres

Check: $25 + 15 = 40$ litres, which matches the given total.

Step 3 – identify what does not change: Only glycol is added and nothing is removed, so the water stays at **25 litres** throughout. This is the anchor.

Step 4 – use the anchor on the new ratio 5 : 4: In the new mixture, water corresponds to 5 parts.

5 parts = 25 litres

One part = $\frac{25}{5} = 5$ litres

Step 5 – find the new glycol quantity: Glycol = 4 parts = $4 \times 5 = 20$ litres

Step 6 – find how much glycol was added: Glycol added = $20 - 15 = 5$ litres

Step 7 – verify: New water = 25 litres, new glycol = 20 litres.

Ratio = $25 : 20 = 5 : 4$, as required. New total = 45 litres, which is the original 40 plus the 5 added.

Why the other options are wrong:

- A, 4: comes from reading the ratio change as "3 parts becomes 4 parts, so add 1 part", and then valuing that part wrongly, or from simply subtracting $4 - 3 = 1$ and multiplying by 4. The parts are worth 5 litres each, not 4.
- C, 6: usually appears when the water is allowed to drift. If someone re-splits the *new* total in the ratio 5 : 4 while forgetting that the water must remain exactly 25 litres, the glycol figure comes out wrong. Water is untouched, so it must be the fixed reference.
- D, 8: comes from applying the difference in parts to the original total, for example $\frac{1}{5}$ of 40, and it ignores that one part is worth 5 litres. Adding 8 litres would give glycol = 23 litres and a ratio of 25 : 23, which is not 5 : 4.

Final Answer: 5 litres $\Rightarrow$ **B**

Answer: (B) [Go Back to Q4](#)



Q5.

Solution

Concept – growth over successive periods MULTIPLIES: The second year's percentage is charged on the value at the end of the first year, not on the original value. Percentages from different bases can never simply be added.

Step 1 – take a convenient starting output: Let the output at the start be 100 units.

Step 2 – apply the first year's 20% growth: Increase = $100 \times \frac{20}{100} = 20$

Output after year 1 = $100 + 20 = 120$

Step 3 – apply the second year's 25% growth to the NEW output of 120:

Increase = $120 \times \frac{25}{100} = 30$

Output after year 2 = $120 + 30 = 150$

Step 4 – find the overall increase over the two years: Increase = $150 - 100 = 50$

Step 5 – express it as a percentage of the ORIGINAL output: Overall growth = $\frac{50}{100} \times 100 = 50\%$

Step 6 – confirm with multipliers: Year 1 multiplier = 1.20

Year 2 multiplier = 1.25

Combined multiplier = $1.20 \times 1.25 = 1.50$

A multiplier of 1.50 is a rise of 0.50, that is **50%**. Both routes agree.

Why the other options are wrong:

- B, 45%: is the misconception at the heart of this question. It comes from **adding** the two percentages, $20 + 25 = 45$, as if both were charged on the same base. The extra 5% is the growth-on-growth: 25% of the 20 units gained in year 1 is 5 units, and $45 + 5 = 50$.
- C, 22.5%: is the **average** of 20 and 25. An average answers "what single yearly rate is typical", not "how much did output rise in total". It is far too small, since output plainly rose by half.
- D, 44%: comes from compounding **20% twice**, since $1.20 \times 1.20 = 1.44$. It uses the first year's rate for both years and drops the given 25% altogether.

Final Answer: 50% $\Rightarrow$ A

Answer: (A) [Go Back to Q5](#)



Q6.

Solution

Concept – a rate question needs a RATIO, never a raw count: The table gives absolute numbers of rejects, but the question asks for a percentage. Every plant has a different production, so the rejects must be divided by that plant's own output before any comparison is legitimate.

Step 1 – write down the formula: $\text{Rejection rate} = \frac{\text{units rejected}}{\text{units produced}} \times 100$

Step 2 – compute for plant P: $\text{Rate} = \frac{48}{1200} \times 100$
 $= 0.04 \times 100 = 4.0\%$

Step 3 – compute for plant Q: $\text{Rate} = \frac{44}{800} \times 100$
 $= 0.055 \times 100 = 5.5\%$

Step 4 – compute for plant R: $\text{Rate} = \frac{60}{1500} \times 100$
 $= 0.04 \times 100 = 4.0\%$

Step 5 – compute for plant S: $\text{Rate} = \frac{26}{500} \times 100$
 $= 0.052 \times 100 = 5.2\%$

Step 6 – compare the four rates: $P = 4.0\%$, $Q = 5.5\%$, $R = 4.0\%$, $S = 5.2\%$

The largest is 5.5%, which belongs to **plant Q**.

Step 7 – note the trap the table is built around: Plant R has the *most* rejects in absolute terms, 60 of them, more than Q's 44. But R also produced 1500 units against Q's 800. Judged per unit made, R is one of the two best plants and Q is the worst. Absolute counts and rates point in opposite directions here, which is exactly what the question is testing.

Why the other options are wrong:

- A, P: rejects 4.0% of its output, tied for the **lowest** rate in the table. Its 48 rejects look large only because it made 1200 units.
- C, R: is the intended trap. It has the highest **number** of rejects (60), so anyone who scans the last column and takes the biggest figure picks R. That is the misconception of reading a count as a rate. R's actual rate is 4.0%, the joint lowest.
- D, S: at 5.2% is genuinely the second worst, so it is close. But $26/500 = 5.2\%$ is still below Q's $44/800 = 5.5\%$. S's small reject count of 26 comes only from its small output of 500.

Final Answer: Plant Q, at 5.5% $\Rightarrow$ **B**



Answer: (B) [Go Back to Q6](#)

Q7.

Solution

Concept – a conclusion follows only if it is forced in EVERY situation the statements allow: Test each conclusion separately. To accept one, prove it cannot fail. To reject one, a single consistent counterexample is enough.

Step 1 – restate statement I as a set relation: Every sensor supplied by vendor X lies inside the set of calibrated sensors. So vendor-X sensors are a **subset** of calibrated sensors. Equivalently: if a sensor is *not* calibrated, it *cannot* be from vendor X.

Step 2 – restate statement II: At least one sensor in the laboratory is not calibrated. Call this group the uncalibrated lab sensors; the group is non-empty.

Step 3 – test conclusion I: Take any one of those uncalibrated lab sensors. It is not calibrated. By the contrapositive fixed in Step 1, it cannot have come from vendor X. So there is at least one lab sensor that is not from vendor X. That is precisely "some sensors in the laboratory were not supplied by vendor X". Conclusion I is **forced**, and it is forced in every possible arrangement, since Step 2 guarantees the group is never empty.

Step 4 – test conclusion II: This claims no lab sensor at all came from vendor X. Statement II only spoke about *some* lab sensors. It says nothing about the remaining lab sensors, which may perfectly well be calibrated ones from vendor X.

Step 5 – build a counterexample to conclusion II: Suppose the laboratory has 10 sensors: 6 came from vendor X and are calibrated, and 4 came from another vendor and are not calibrated. Statement I holds, since every vendor-X sensor is calibrated. Statement II holds, since 4 lab sensors are uncalibrated. Yet 6 lab sensors *did* come from vendor X, so conclusion II is false. One consistent counterexample is enough: conclusion II does **not** follow.

Step 6 – combine the two verdicts: Conclusion I follows, conclusion II does not. So only conclusion I follows.

Why the other options are wrong:

- A, only conclusion II follows: reverses both verdicts. It requires conclusion II to be forced, which Step 5 disproves, and conclusion I to fail, which Step 3 disproves.
- C, both follow: accepts conclusion II as well. This is the misconception of



turning "some are not X" into "none are X", that is, letting a partial statement swallow the whole set. Statement II licenses no claim at all about the lab sensors it did not mention.

- D, neither follows: rejects conclusion I. But Step 3 is a strict deduction, not a guess: an uncalibrated sensor exists, and no uncalibrated sensor can be from vendor X, so a non-vendor-X lab sensor must exist. There is no arrangement of the two statements in which conclusion I fails.

Final Answer: Only conclusion I follows $\Rightarrow$ B

Answer: (B) [Go Back to Q7](#)

Q8.

Solution

Concept – in a number code, first convert letters to their alphabet positions, then look for the arithmetic that turns those positions into the given numbers: Two coded words are supplied so that the rule can be found on one and confirmed on the other. Never infer the rule from the answer options.

Step 1 – write the alphabet positions of ROD: R = 18, O = 15, D = 4

Step 2 – line these up against the given code 54-45-12: 18 $\rightarrow$ 54

15 $\rightarrow$ 45

4 $\rightarrow$ 12

Step 3 – find the operation: $54 \div 18 = 3$

$45 \div 15 = 3$

$12 \div 4 = 3$

Every position is multiplied by the same factor 3. The rule is: code = alphabet position $\times$ 3.

Step 4 – confirm the rule on the second word PIN: P = 16, I = 9, N = 14

$16 \times 3 = 48$

$9 \times 3 = 27$

$14 \times 3 = 42$

This gives 48-27-42, which is exactly the code supplied for PIN. The rule is confirmed on an independent word, so it is safe to apply.

Step 5 – write the alphabet positions of DIG: D = 4, I = 9, G = 7

Step 6 – apply the rule, one letter per line: D: $4 \times 3 = 12$



$$I: 9 \times 3 = 27$$

$$G: 7 \times 3 = 21$$

Step 7 – assemble in the same order as the word: DIG $\rightarrow$ 12-27-21

Step 8 – cross-check using a shared letter: Both PIN and DIG contain the letter I, and PIN codes it as 27. Any correct answer for DIG must also carry 27 in the position of its I, and 12-27-21 does.

Why the other options are wrong:

- B, 12-27-18: gets D and I right but codes G as 18, which needs a position of 6. G is the **seventh** letter, not the sixth. This is the standard off-by-one slip from counting the alphabet starting at zero, or from forgetting a letter while counting up from A.
- C, 8-18-14: multiplies every position by **2** instead of 3, giving $4 \times 2 = 8$, $9 \times 2 = 18$, $7 \times 2 = 14$. Testing this factor on ROD would give 36-30-8, nowhere near the given 54-45-12, so it fails the very pair it was supposed to be derived from.
- D, 21-27-12: uses the right three numbers but writes them **in reverse order**, coding G first and D last. Nothing in ROD $\rightarrow$ 54-45-12 reverses anything; R, the first letter, maps to 54, the first number.

Final Answer: 12-27-21 $\Rightarrow$ A

Answer: (A) [Go Back to Q8](#)

Q9.

Solution

Concept – track each attribute of the figures SEPARATELY: When a sequence has more than one thing changing, list the attributes, find the rule for each on its own, then extend every rule and combine the results into a single figure.

Step 1 – identify the attributes that vary: Two things change from figure to figure: the **number of sides** of the polygon, and the **number of dots** inside it.

Step 2 – read off the number of sides: Figure 1 is a triangle: 3 sides

Figure 2 is a square: 4 sides

Figure 3 is a pentagon: 5 sides

Figure 4 is a hexagon: 6 sides

Step 3 – state the rule for the sides: The count goes 3, 4, 5, 6, rising by exactly 1 each time.



Step 4 – extend the side rule: Sides in figure 5 = $6 + 1 = 7$, so the polygon is a heptagon.

Step 5 – read off the number of dots: Figure 1 has 1 dot

Figure 2 has 2 dots

Figure 3 has 3 dots

Figure 4 has 4 dots

Step 6 – state the rule for the dots: The count goes 1, 2, 3, 4, also rising by exactly 1 each time.

Step 7 – extend the dot rule: Dots in figure 5 = $4 + 1 = 5$

Step 8 – state the link between the two attributes as a check: In every figure, dots = sides – 2. Check: $3 - 2 = 1$, $4 - 2 = 2$, $5 - 2 = 3$, $6 - 2 = 4$. All four hold. For figure 5 this gives dots = $7 - 2 = 5$, which agrees with Step 7.

Step 9 – combine: Figure 5 is a heptagon containing 5 dots.

Why the other options are wrong:

- A, hexagon with 5 dots: advances the dots but leaves the sides at 6, repeating figure 4's polygon. It catches anyone who spots only the dot rule and stops there.
- B, heptagon with 4 dots: is the mirror error. It advances the sides but freezes the dots at figure 4's count. Both attributes move, and each must be extended.
- D, octagon with 5 dots: over-steps the side rule by jumping from 6 to 8. The sides climb by 1, not by 2. It also breaks the dots = sides – 2 link, since an octagon on that link would need 6 dots.

Final Answer: A heptagon containing 5 dots $\Rightarrow$ C

Answer: (C) [Go Back to Q9](#)

Q10.

Solution

Concept – faces that share an edge in the net can never be opposite in the cube: Two faces are opposite only if they never touch. On a straight strip of squares, opposite faces sit **two apart**, because the strip wraps around the cube like a belt.

Step 1 – describe the net: Four squares lie in a horizontal strip: **P, Q, R, S** from left to right. One square, **T**, sits directly above **Q**, and one square, **U**, sits directly



below Q.

Step 2 – see what the strip of four becomes: P, Q, R, S are joined edge to edge in a line. Folding them at right angles wraps them into a closed **band** around the cube, and S closes back onto P. A cube band is made of exactly 4 side faces.

Step 3 – apply the two-apart rule to the band: Going round the band the order is P, Q, R, S and back to P. Faces one step apart are adjacent; faces two steps apart are opposite. So:

P is opposite R

Q is opposite S

Step 4 – read off the answer for Q: Q sits at position 2 in the strip, so its opposite is position 4, which is S.

Step 5 – account for the remaining two faces: T and U are the flaps above and below Q. When the band closes, T folds down to become the top face and U folds up to become the bottom face. So T is opposite U, and the three pairs are P–R, Q–S and T–U. All six faces are used exactly once, which confirms the pairing is complete and consistent.

Step 6 – confirm by adjacency: Q shares an edge with P, with R, with T and with U in the net. A face touches exactly 4 others in a cube and is opposite the one remaining face. Q touches four faces, and the only face left over is S. So Q is opposite S.

Why the other options are wrong:

- B, R: shares an edge with Q in the net, so R and Q meet at that edge in the folded cube. Faces that meet can never be opposite. This is the misconception of taking "the next square along the strip" as the opposite face; on a strip, that square is adjacent and the opposite one is two steps further.
- C, T: shares the top edge of Q, so T is adjacent to Q as well. T folds down to become the cube's top face, and Q is one of its four side neighbours. T's true opposite is U.
- D, U: shares the bottom edge of Q and is adjacent to Q for the same reason. U becomes the cube's bottom face, opposite T, not opposite Q.

Final Answer: S $\Rightarrow$ A

Answer: (A) [Go Back to Q10](#)



Answer Key

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

