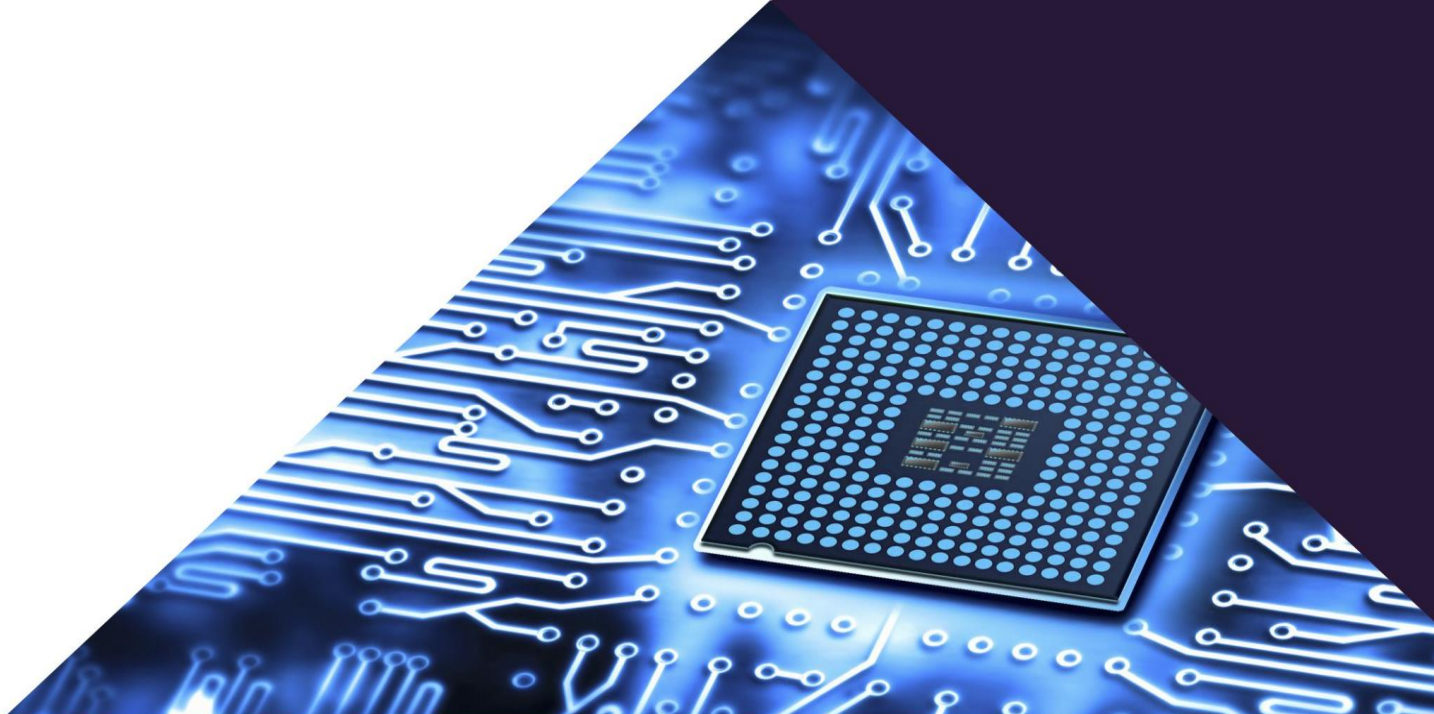


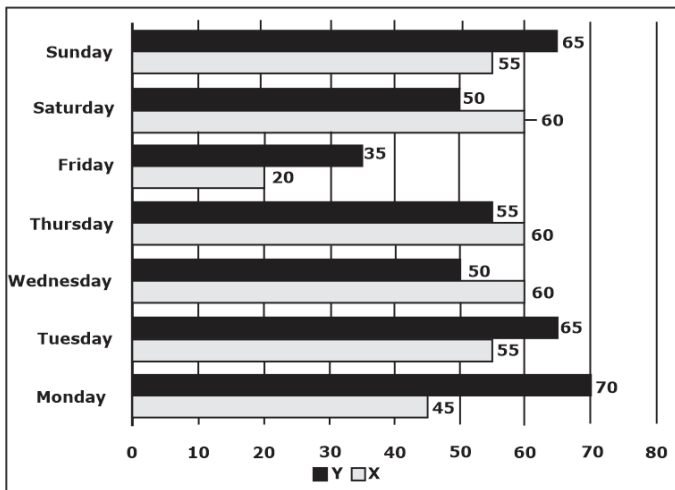
GATE 2021

Electronics
& Communication
Engineering

▶ **General Aptitude
Questions & Solutions**



1.



The number of minutes spent by two students, X and Y, exercising every day in a given week are shown in the bar chart above.

The number of days in the given week in which one of the students spent a minimum of 10% more than the other student, on a given day, is

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

Ans. D

Sol. Sunday $\Rightarrow 55 + 10\% = 60.5$
 $65 > 60.5$
 Monday $\Rightarrow 45 + 5.5\% = 49.5$
 $70 > 49.5$
 Tuesday $\Rightarrow 55 + 10\% = 60.5$
 $65 > 60.5$
 Wednesday $\Rightarrow 50 + 10\% = 55$
 $60 > 55$
 Thursday $\Rightarrow 55 + 10\% = 60.5$
 $60 < 60.5$
 Friday $\Rightarrow 20 + 10\% = 22$
 $35 > 22$
 Saturday $\Rightarrow 50 + 10\% = 55$
 $60 > 55$

2. p and q are positive integers and $\frac{p}{q} + \frac{q}{p} = 3$,

then $\frac{p^2}{q^2} + \frac{q^2}{p^2} =$

- A. 3
- B. 11
- C. 9
- D. 7

Ans. D

Sol. $\frac{p}{q} + \frac{q}{p} = 3$

$$\left(\frac{p}{q} + \frac{q}{p}\right)^2 = 3^2$$

$$\left(\frac{p}{q}\right)^2 + \left(\frac{q}{p}\right)^2 + 2\left(\frac{p}{q}\right)\left(\frac{q}{p}\right) = 9$$

$$\frac{p^2}{q^2} + \frac{q^2}{p^2} = 7$$

3. Computers are ubiquitous. They are used to improve efficiency in almost all fields from agriculture to space exploration. Artificial intelligence (AI) is currently a hot topic. AI enables computers to learn, given enough training data. For humans sitting in front of a computer for long hours can lead to health issues.

Which of the following can be deduced from the above passage?

- (i) Nowadays, computers are present in almost all places.
- (ii) Computers cannot be used for solving problems in engineering.
- (iii) For humans, there are both positive and negative effects of using computers.
- (iv) Artificial intelligence can be done without data.

- A. (i) and (iii)
- B. (ii) and (iii)
- C. (i), (iii) and (iv)
- D. (ii) and (iv)

Ans. A

Sol. Nowadays, computers are present in almost all places. "efficiency in almost all fields from agriculture to space exploration" is true.

Computers cannot be used for solving problems in engineering. This statement is false. This is contradictory to the given passage. "from agriculture to space exploration"

For humans, there are both positive and negative effects of using computers. This statement is true. "can lead to health issues" shows the negative effect and positive effect is shown by "improve efficiency in almost all fields".

Artificial intelligence can be done without data. This statement is false. This is contradictory to the given passage. "given enough training data".

So, correct option is A.

4. The current population of a city is 11,02,500. If it has been increasing at the rate of 5% per annum, what was its population 2 years ago?

1. 10,00,000 2. 9,92,500
3. 12,51,506 4. 9,95,006

Ans. A

Sol. Current Population of city = 1102500

P_0 = Population of the the city 2 year ago

$n = 2$

$$P = P_0 \left(1 + \frac{r}{100} \right)^n$$

$$1102500 = P_0 \left(1 + \frac{5}{100} \right)^2$$

$$1102500 = P_0(1.05)^2$$

$$P_0 = 1000000$$

5. Nostalgia is to anticipation as _____ is to _____
Which one of the following maintains a similar logical relation in the above sentence?

- A. Future, past B. Present, past
C. Past, future D. Future, present

Ans. C

Sol. Nostalgia: Anything or feeling that happen in past.

Anticipation: the fact of seen that something might happen in the future.

So, we can write Nostalgia is to anticipation as past is to future.

Therefore, Nostalgia is to anticipation as past is to future.

6. Consider the following sentences:

- (i) I woke up from sleep.
(ii) I woked up from sleep.
(iii) I was woken up from sleep.
(iv) I was wokened up from sleep.

Which of the above sentences are grammatically CORRECT?

- A. (i) and (ii) B. (i) and (iii)
C. (ii) and (iii) D. (i) and (iv)

Ans. B

Sol. Wake means to stop sleeping; to make somebody stop sleeping.

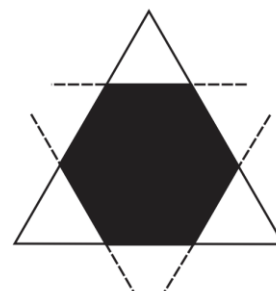
The three forms of the verb "wake":

- Present – Wake
- Past – Woke
- Past participle – Woken/Waked

The sentence (i) I woke up from sleep and sentence (iii) I was woken up from sleep is correct.

Hence, option (i) and (iii) is correct.

7.



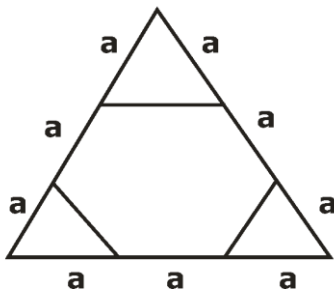
Corners are cut from an equilateral triangle to produce a regular convex hexagon as shown in the figure above.

The ratio of the area of the regular convex hexagon to the area of the original equilateral triangle is

- A. 3 : 4
- B. 2 : 3
- C. 4 : 5
- D. 5 : 6

Ans. B

Sol.



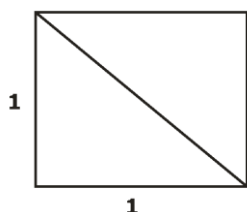
$$\frac{\text{area of hexagon}}{\text{area of triangle}} = \frac{6 \times \frac{\sqrt{3}}{4} \left(\frac{a}{3}\right)^2}{\frac{\sqrt{3}}{4} (3a)^2} = \frac{6}{9} = \frac{2}{3}$$

8. Consider a square sheet of side 1 unit. In the first step, it is cut along the main diagonal to get two triangles. In the next step, one of the triangles is revolved about its short edge to form a solid cone. The volume of the resulting cone, in cubic units, is _____

- A. 3π
- B. $\frac{3\pi}{2}$
- C. $\frac{\pi}{3}$
- D. $\frac{2\pi}{3}$

Ans. C

Sol.



$$V = \frac{1}{3} \pi r^2 h = \frac{1}{3} \pi$$

9. Given below are two statements and two conclusions.

Statement 1: All purple are green.

Statement 2: All black are green.

Conclusion I: Some black are purple.

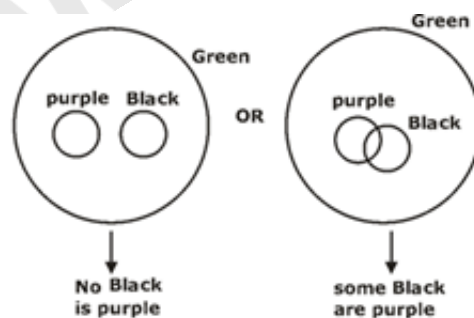
Conclusion II: No black is purple.

Based on the above statements and conclusions, which one of the following is logically CORRECT?

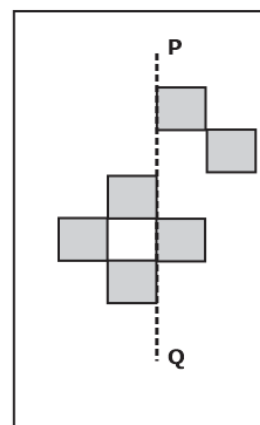
- A. Both conclusion I and II are correct.
- B. Either conclusion I or II is correct.
- C. Only conclusion II is correct.
- D. Only conclusion I is correct.

Ans. B

Sol.



10.



The least number of squares that must be added so that the line P-Q becomes the line of symmetry is _____

- A. 4
- B. 3
- C. 6
- D. 7

Ans. C

Sol.

