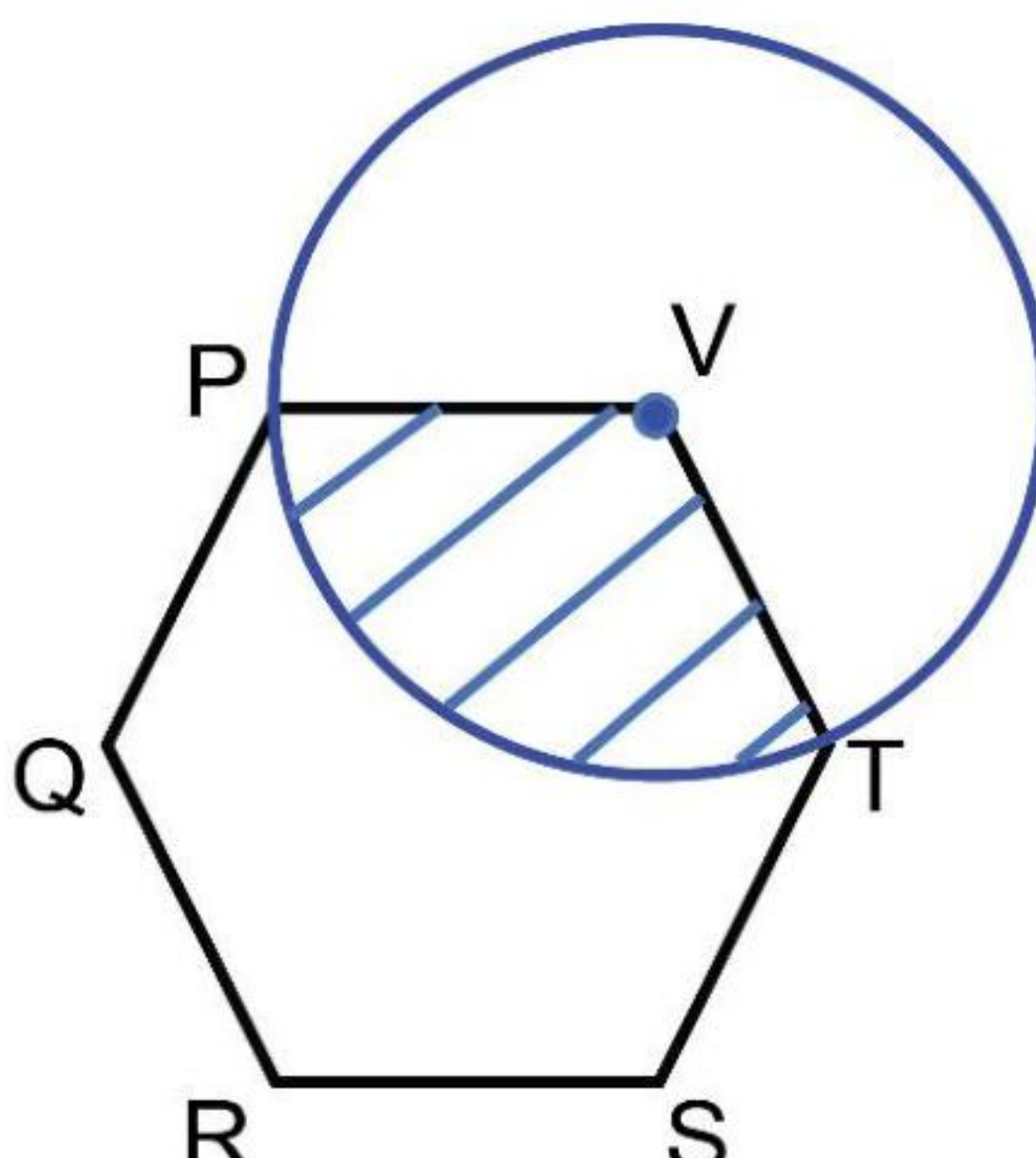


**General Aptitude (GA)****Q.1 – Q.5 Carry ONE mark Each**

|     |                                                                               |
|-----|-------------------------------------------------------------------------------|
| Q.1 | “I have not yet decided what I will do this evening; I _____ visit a friend.” |
|     |                                                                               |
| (A) | mite                                                                          |
| (B) | would                                                                         |
| (C) | might                                                                         |
| (D) | didn't                                                                        |
|     |                                                                               |

|     |                                                        |
|-----|--------------------------------------------------------|
| Q.2 | Eject : Insert :: Advance : _____<br>(By word meaning) |
|     |                                                        |
| (A) | Advent                                                 |
| (B) | Progress                                               |
| (C) | Retreat                                                |
| (D) | Loan                                                   |
|     |                                                        |

|     |                                                                                                                                                                                                                                                  |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.3 | In the given figure, PQRSTV is a regular hexagon with each side of length 5 cm. A circle is drawn with its centre at V such that it passes through P. What is the area (in $\text{cm}^2$ ) of the shaded region? (The diagram is representative) |
|     |                                                                                                                                                               |
| (A) | $\frac{25\pi}{3}$                                                                                                                                                                                                                                |
| (B) | $\frac{20\pi}{3}$                                                                                                                                                                                                                                |
| (C) | $6\pi$                                                                                                                                                                                                                                           |
| (D) | $7\pi$                                                                                                                                                                                                                                           |

|     |                                                                                                                                                                                                 |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.4 | <p>A duck named Donald Duck says “All ducks always lie.”</p> <p>Based only on the information above, which one of the following statements can be logically inferred with <i>certainty</i>?</p> |
|     |                                                                                                                                                                                                 |
| (A) | Donald Duck always lies.                                                                                                                                                                        |
| (B) | Donald Duck always tells the truth.                                                                                                                                                             |
| (C) | Donald Duck’s statement is true.                                                                                                                                                                |
| (D) | Donald Duck’s statement is false.                                                                                                                                                               |
|     |                                                                                                                                                                                                 |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.5 | <p>A line of symmetry is defined as a line that divides a figure into two parts in a way such that each part is a mirror image of the other part about that line.</p> <p>The figure below consists of 20 unit squares arranged as shown. In addition to the given black squares, upto 5 more may be coloured black. Which one among the following options depicts the minimum number of boxes that must be coloured black to achieve two lines of symmetry? (The figure is representative)</p> |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| (A) | d                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| (B) | c, d, i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| (C) | c, i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| (D) | c, d, i, f, g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

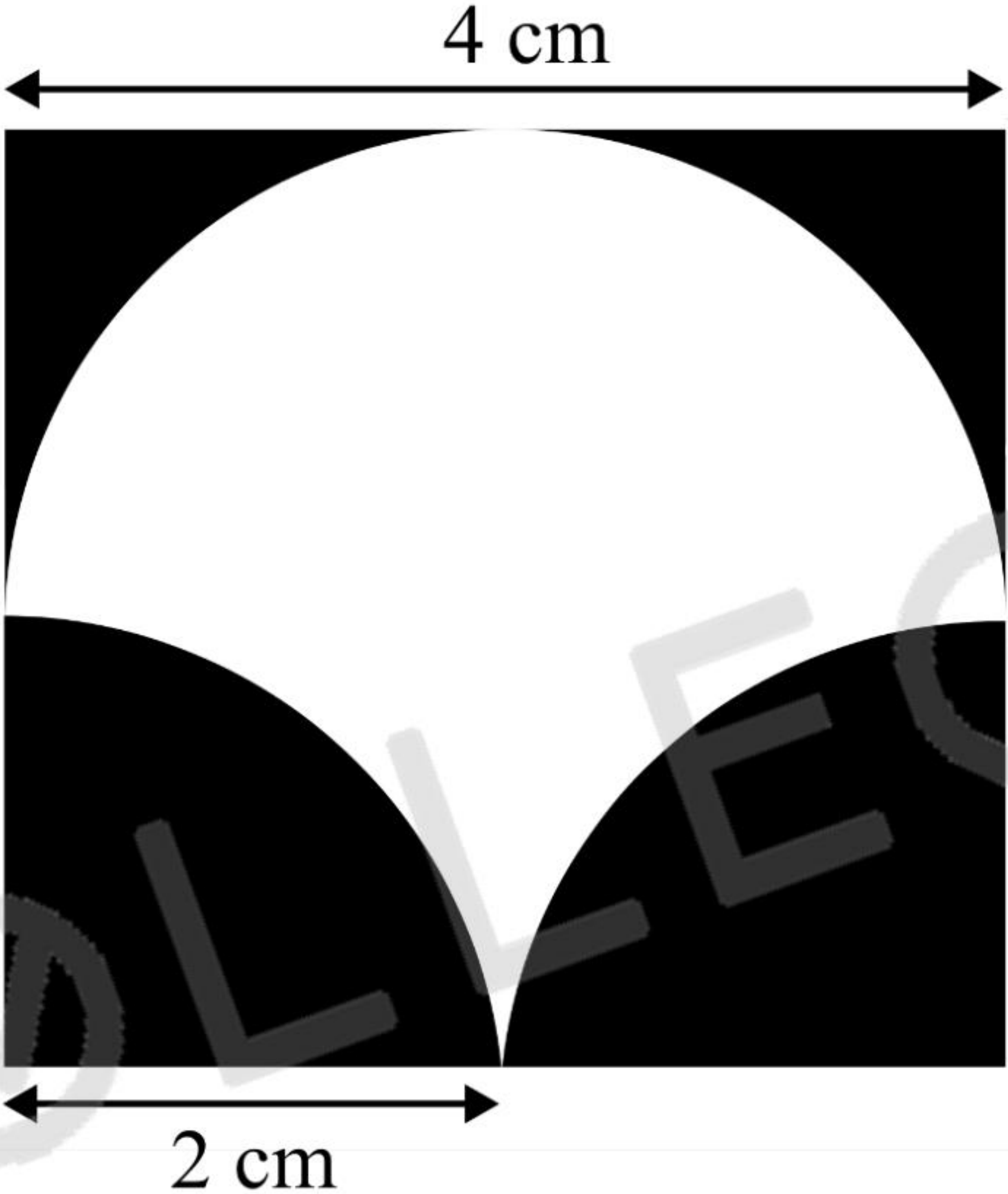
**Q.6 – Q.10 Carry TWO marks Each**

|     |                                                                                                                                                              |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.6 | Based only on the truth of the statement ‘Some humans are intelligent’, which one of the following options can be logically inferred with <i>certainty</i> ? |
|     |                                                                                                                                                              |
| (A) | No human is intelligent.                                                                                                                                     |
| (B) | All humans are intelligent.                                                                                                                                  |
| (C) | Some non-humans are intelligent.                                                                                                                             |
| (D) | Some intelligent beings are humans.                                                                                                                          |

|     |                                                                                                                                                                                         |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.7 | Which one of the options can be inferred about the mean, median, and mode for the given probability distribution ( <i>i.e.</i> probability mass function), $P(x)$ , of a variable $x$ ? |
|     |                                                                                                                                                                                         |
| (A) | mean = median $\neq$ mode                                                                                                                                                               |
| (B) | mean = median = mode                                                                                                                                                                    |
| (C) | mean $\neq$ median = mode                                                                                                                                                               |
| (D) | mean $\neq$ mode = median                                                                                                                                                               |
|     |                                                                                                                                                                                         |



|     |                                                                                                                                                                                                   |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.9 | Let $a = 30!$ , $b = 50!$ , and $c = 100!$ . Consider the following numbers:<br>$\log_a c, \quad \log_c a, \quad \log_b a, \quad \log_a b$<br>Which one of the following inequalities is CORRECT? |
|     |                                                                                                                                                                                                   |
| (A) | $\log_c a < \log_b a < \log_a b < \log_a c$                                                                                                                                                       |
| (B) | $\log_c a < \log_a b < \log_b a < \log_b c$                                                                                                                                                       |
| (C) | $\log_c a < \log_b a < \log_a c < \log_a b$                                                                                                                                                       |
| (D) | $\log_b a < \log_c a < \log_a b < \log_a c$                                                                                                                                                       |
|     |                                                                                                                                                                                                   |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.10 | <p>A square of side length 4 cm is given. The boundary of the shaded region is defined by one semi-circle on the top and two circular arcs at the bottom, each of radius 2 cm, as shown.</p> <p>The area of the shaded region is _____ <math>\text{cm}^2</math>.</p>                                                                                                                                                        |
|      |  <p>The diagram shows a square with a side length of 4 cm. A semi-circle is drawn on the top side of the square, with its diameter equal to the side length. Two quarter-circles are drawn on the bottom side of the square, each with a radius of 2 cm. The region between the semi-circle and the quarter-circles is shaded black.</p> |
| (A)  | 8                                                                                                                                                                                                                                                                                                                                                                                                                           |
| (B)  | 4                                                                                                                                                                                                                                                                                                                                                                                                                           |
| (C)  | 12                                                                                                                                                                                                                                                                                                                                                                                                                          |
| (D)  | 10                                                                                                                                                                                                                                                                                                                                                                                                                          |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Q.11 – Q.35 Carry ONE mark Each**

|      |                                                                                                                                                                                                             |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.11 | The area of the region bounded by the parabola $x = -y^2$ and the line $y = x + 2$ equals                                                                                                                   |
| (A)  | $\frac{3}{2}$                                                                                                                                                                                               |
| (B)  | $\frac{7}{2}$                                                                                                                                                                                               |
| (C)  | $\frac{9}{2}$                                                                                                                                                                                               |
| (D)  | 9                                                                                                                                                                                                           |
| Q.12 | Let $A$ be a $3 \times 3$ real matrix having eigenvalues 1, 0, and $-1$ .<br>If $B = A^2 + 2A + I_3$ , where $I_3$ is the $3 \times 3$ identity matrix, then which one of the following statements is true? |
| (A)  | $B^3 - 5B^2 + 4B = 0$                                                                                                                                                                                       |
| (B)  | $B^3 - 5B^2 - 4B = 0$                                                                                                                                                                                       |
| (C)  | $B^3 + 5B^2 - 4B = 0$                                                                                                                                                                                       |
| (D)  | $B^3 + 5B^2 + 4B = 0$                                                                                                                                                                                       |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.13 | <p>Consider the following statements.</p> <p>(I) Let <math>A</math> and <math>B</math> be two <math>n \times n</math> real matrices. If <math>B</math> is invertible, then <math>\text{rank}(BA) = \text{rank}(A)</math>.</p> <p>(II) Let <math>A</math> be an <math>n \times n</math> real matrix. If <math>A^2\mathbf{x} = \mathbf{b}</math> has a solution for every <math>\mathbf{b} \in \mathbb{R}^n</math>, then <math>A\mathbf{x} = \mathbf{b}</math> also has a solution for every <math>\mathbf{b} \in \mathbb{R}^n</math>.</p> <p>Which of the above statements is/are true?</p> |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| (A)  | Only (I)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| (B)  | Only (II)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| (C)  | Both (I) and (II)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| (D)  | Neither (I) nor (II)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |



|      |                                                                                                                                                                                                                                                                                                                                                                     |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.15 | <p>Let <math>\Phi(\cdot)</math> denote the cumulative distribution function of a standard normal random variable. If the random variable <math>X</math> has the cumulative distribution function</p> $F(x) = \begin{cases} \Phi(x) & \text{if } x < -1 \\ \Phi(x+1) & \text{if } x \geq -1, \end{cases}$ <p>then which one of the following statements is true?</p> |
|      |                                                                                                                                                                                                                                                                                                                                                                     |
| (A)  | $P(X \leq -1) = \frac{1}{2}$                                                                                                                                                                                                                                                                                                                                        |
| (B)  | $P(X = -1) = \frac{1}{2}$                                                                                                                                                                                                                                                                                                                                           |
| (C)  | $P(X < -1) = \frac{1}{2}$                                                                                                                                                                                                                                                                                                                                           |
| (D)  | $P(X \leq 0) = \frac{1}{2}$                                                                                                                                                                                                                                                                                                                                         |
|      |                                                                                                                                                                                                                                                                                                                                                                     |

|      |                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.16 | <p>Let <math>X</math> be a random variable with probability density function</p> $f(x) = \begin{cases} \alpha \lambda x^{\alpha-1} e^{-\lambda x^\alpha} & \text{if } x > 0 \\ 0 & \text{otherwise,} \end{cases}$ <p>where <math>\alpha &gt; 0</math> and <math>\lambda &gt; 0</math>. If the median of <math>X</math> is 1 and the third quantile is 2, then <math>(\alpha, \lambda)</math> equals</p> |
|      |                                                                                                                                                                                                                                                                                                                                                                                                         |
| (A)  | $(1, \log_e 2)$                                                                                                                                                                                                                                                                                                                                                                                         |
| (B)  | $(1, 1)$                                                                                                                                                                                                                                                                                                                                                                                                |
| (C)  | $(2, \log_e 2)$                                                                                                                                                                                                                                                                                                                                                                                         |
| (D)  | $(1, \log_e 3)$                                                                                                                                                                                                                                                                                                                                                                                         |
|      |                                                                                                                                                                                                                                                                                                                                                                                                         |

|      |                                                                                                                                         |
|------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Q.17 | Let $X$ be a random variable having Poisson distribution with mean $\lambda > 0$ . Then $E\left(\frac{1}{X+1} \mid X > 0\right)$ equals |
| (A)  | $\frac{1 - e^{-\lambda} - \lambda e^{-\lambda}}{\lambda(1 - e^{-\lambda})}$                                                             |
| (B)  | $\frac{1 - e^{-\lambda}}{\lambda}$                                                                                                      |
| (C)  | $\frac{1 - e^{-\lambda} - \lambda e^{-\lambda}}{\lambda}$                                                                               |
| (D)  | $\frac{1 - e^{-\lambda}}{\lambda + 1}$                                                                                                  |
|      |                                                                                                                                         |



|      |                                                                                                                                                                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.19 | <p>Let <math>(X, Y)</math> have joint probability density function</p> $f(x, y) = \begin{cases} 8xy & \text{if } 0 < x < y < 1 \\ 0 & \text{otherwise.} \end{cases}$ <p>If <math>E(X   Y = y_0) = \frac{1}{2}</math>, then <math>y_0</math> equals</p> |
|      |                                                                                                                                                                                                                                                        |
| (A)  | $\frac{3}{4}$                                                                                                                                                                                                                                          |
| (B)  | $\frac{1}{2}$                                                                                                                                                                                                                                          |
| (C)  | $\frac{1}{3}$                                                                                                                                                                                                                                          |
| (D)  | $\frac{2}{3}$                                                                                                                                                                                                                                          |
|      |                                                                                                                                                                                                                                                        |





















|      |                                                                                                                                                                                                                                                                          |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q.37 | <p>Let <math>X</math> be a random variable with probability density function</p> $f(x) = \begin{cases} \frac{1}{x^2} & \text{if } x \geq 1 \\ 0 & \text{otherwise.} \end{cases}$ <p>If <math>Y = \log_e X</math>, then <math>P(Y &lt; 1 \mid Y &lt; 2)</math> equals</p> |
| (A)  | $\frac{e}{1+e}$                                                                                                                                                                                                                                                          |
| (B)  | $\frac{e-1}{e+1}$                                                                                                                                                                                                                                                        |
| (C)  | $\frac{1}{1+e}$                                                                                                                                                                                                                                                          |
| (D)  | $\frac{1}{e-1}$                                                                                                                                                                                                                                                          |
|      |                                                                                                                                                                                                                                                                          |







































