

Q1. 21 January Shift 2

A random variable X takes values 0, 1, 2, 3 with probabilities $\frac{2a+1}{30}$, $\frac{8a-1}{30}$, $\frac{4a+1}{30}$, b respectively, where $a, b \in \mathbf{R}$. Let μ and σ respectively be the mean and standard deviation of X such that $\sigma^2 + \mu^2 = 2$. Then $\frac{a}{b}$ is equal to :

- (1) 12 (2) 30 (3) 60 (4) 3

Q2. 22 January Shift 1

If a random variable x has the probability distribution

x	0	1	2	3	4	5	6	7
$P(x)$	0	$2k$	k	$3k$	$2k^2$	$2k$	$k^2 + k$	$7k^2$

then $P(3 < x \leq 6)$ is equal to

- (1) 0.64 (2) 0.22 (3) 0.33 (4) 0.34

Q3. 22 January Shift 1

Two distinct numbers a and b are selected at random from $1, 2, 3, \dots, 50$. The probability, that their product ab is divisible by 3, is

- (1) $\frac{272}{1225}$ (2) $\frac{561}{1225}$ (3) $\frac{664}{1225}$ (4) $\frac{8}{25}$

Q4. 23 January Shift 1

From the first 100 natural numbers, two numbers first a and then b are selected randomly without replacement. If the probability that $a - b \geq 10$ is $\frac{m}{n}$, $\gcd(m, n) = 1$, then $m + n$ is equal to ____.

Q5. 23 January Shift 2

Bag A contains 9 white and 8 black balls, while bag B contains 6 white and 4 black balls. One ball is randomly picked up from the bag B and mixed up with the balls in the bag A. Then a ball is randomly drawn from the bag A. If the probability, that the ball drawn is white, is $\frac{p}{q}$, $\gcd(p, q) = 1$, then $p + q$ is equal to

- (1) 23 (2) 24 (3) 21 (4) 22

Q6. 24 January Shift 1

From a lot containing 10 defective and 90 non-defective bulbs, 8 bulbs are selected one by one with replacement.

Then the probability of getting at least 7 defective bulbs is

- (1) $\frac{67}{10^8}$ (2) $\frac{7}{10^7}$ (3) $\frac{81}{10^8}$ (4) $\frac{73}{10^8}$

Q7. 24 January Shift 2

Let S be a set of 5 elements and $P(S)$ denote the power set of S . Let E be an event of choosing an ordered pair (A, B) from the set $P(S) \times P(S)$ such that $A \cap B = \emptyset$. If the probability of the event E is $\frac{3^p}{2^q}$, where $p, q \in N$, then $p + q$ is equal to _____

Q8. 28 January Shift 1

A bag contains 10 balls out of which k are red and $(10 - k)$ are black, where $0 \leq k \leq 10$. If three balls are drawn at random without replacement and all of them are found to be black, then the probability that the bag contains 1 red ball and 9 black balls is:

(1) $\frac{14}{55}$ (2) $\frac{7}{55}$ (3) $\frac{7}{110}$ (4) $\frac{7}{11}$ **Q9. 28 January Shift 2**

The probability distribution of a random variable X is given below :

X	$4k$	$\frac{30}{7}k$	$\frac{32}{7}k$	$\frac{34}{7}k$	$\frac{36}{7}k$	$\frac{38}{7}k$	$\frac{40}{7}k$	$6k$
$P(X)$	$\frac{2}{15}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{1}{5}$	$\frac{1}{15}$	$\frac{2}{15}$	$\frac{1}{5}$	$\frac{1}{15}$

If $E(X) = \frac{263}{15}$, then $P(X < 20)$ is equal to :

(1) $\frac{11}{15}$ (2) $\frac{3}{5}$ (3) $\frac{14}{15}$ (4) $\frac{8}{15}$ **ANSWER KEYS**

1. (3) 2. (3) 3. (3) 4. 311 5. (1) 6. (4) 7. 15 8. (1)
9. (1)