PROBABILITY

Single Correct Answer Type

1. If a positive integral divisor of 16200 is selected of random, given that it is even, the chance that it will have exactly four divisors is ___

   (A) $\frac{1}{15}$ (B) $\frac{2}{15}$ (C) $\frac{1}{15}$ (D) $\frac{1}{4}$

2. Let $\lambda \in \{-2,-1,0,1,2\}$ then the chance that the equation $|x^2+3x|+\lambda-\lambda x=0$ possesses exactly three solutions, given that it possesses atleast 2 solutions is

   (A) $\frac{1}{3}$ (B) $\frac{1}{5}$ (C) $\frac{2}{3}$ (D) 0

3. There are 10 empty seats in a row. Three persons A, B, C wish to occupy. Given that no. two of them sit adjacent the chance that B sits in the middle between A and C is

   (A) $\frac{1}{7}$ (B) $\frac{1}{14}$ (C) $\frac{2}{7}$ (D) None

4. Six persons stand at random in a queue for buying cinema ticket individually. Three of them have only a five rupee note each while each of the other three has a ten rupee note only. The booking clerk has an empty cash box. Then the probability that the six persons will get tickets so that each paying rupees five is

   (A) 3/4 (B) 1/4 (C) 1/2 (D) 3/5

5. If $f(x)=x^3+ax^2+bx+c$ and parameters a,b,c are chosen by rolling 3 dice, the probability that $f(x)$ is increasing

   (A) 5/36 2) 8/36 3) 4/9 (D) 1/3

6. Four people sit round a circular table, and each person will a roll a normal six sided die once. The probability that no two people sitting next to each other will roll the same number is

   (A) 630/1296 (B) 670/1296 (C) 650/1296 (D) 600/1296

7. $A_1,A_2,A_3,.....A_{21}$ be the 21 -vertices of a regular polygon of 21-sides inscribed in a circle with centre O. Triangle are formed by joining the vertices of this regular polygon. From these triangles, if a triangle is chosen at random. Probability that chosen triangle is right angled triangle

   (A) 196/1330 (B) 2/1330 (C) 945/1330 (D) 0

8. The probability that a man makes a certain dangerous journey by car, motor cycle or on foot are 1/2, 1/6 and 1/3 respectively. The probabilities of an accident when he uses these means of transport are 1/5, 2/5 and 1/10 respectively. The probability of, if an accident is known to have happened, the probability that the man was travelling by car, is

   (A) 3/2 (B) 1/5 (C) 1/2 (D) 1/3

9. Of the three independent events E_1,E_2 and E_3 the probability that only E_1 occurs is α, only E_2 occurs is β and only E_3 occurs is γ. Let the probability p that none of events E_1,E_2 or E_3 occurs satisfy the equation $(\alpha-2\beta)p=\alpha\beta$ and $(\beta-3\gamma)p=2\beta\gamma$. All the given probabilities are assumed to lie in the interval $(0,1)$. Then $\frac{\text{Probability of occurence of } E_1}{\text{Probability of occurence of } E_3}=$ _____

   (A) 5 (B) 4 (C) 3 (D) 6

10. If the letters of the word 'MATHEMATICS' are arranged around the circle randomly, then the probability that alike letters are not together is

    (A) 37/90 (B) 49/90 (C) 47/90 (D) none of these

11. A bag contains 5 balls of unknown colors, two balls are drawn at random from the bag and are found to be red. The probability that the bag contains exactly 4 red balls is.

(A) $\frac{3}{5}$ (B) $\frac{3}{10}$ (C) $\frac{5}{13}$ (D) $\frac{4}{13}$

12. There are twenty points $A_1, A_2, ..., A_{20}$ on a circle. The number of ways of selecting 4 points such that there are at least two points in between any two selected points is

(A) $^{20}C_1.^{11}C_3$ (B) $^{20}C_1.\frac{^{11}C_3}{4}$ (C) $^{20}C_1.\frac{^{10}C_3}{4}$ (D) none of these

13. Two buses A and B are scheduled to arrive at a town central bus station at noon. The probability that bus A will be late is 1/5. The probability that bus B will be late is 7/25. The probability that the bus B is late given that bus A is late is 9/10 Then.

(A) Probability that neither bus will be late on a particular day is 7/10

(B) Probability that bus A is late given that bus B is late is 8/28

(C) Probability that at least one bus is late is 6/10

(D) Probability that at least one bus is in time is 4/5

14. Each of the 'n' urns contain 4 white and 6 black balls. The $(n + 1)^{th}$ urn contains 5 white and 5 black balls. One of the urn is chosen at random and two balls are drawn from it without replacement. Both the balls turn out to be black. If the probability that the $(n + 1)^{th}$ urn was chosen to draw the balls is $\frac{1}{16}$, then the value of n is

(A) 10 (B) 11 (C) 12 (D) 13

15. A JEE aspirant estimates that she will be successful with an 80% chance if she studies 10 hours per day, with a 60% chance if she studies 7 hours per day and with a 40% chance if she studies 4 hours per day. She further believes that she will study10 hours, 7 hours and 4 hours per day with probabilities 0.1, 0.2 and 0.7 respectively and Given that she is successful, the probability she studied for 4 hours is

(A) $\frac{6}{12}$ (B) $\frac{9}{12}$ (C) $\frac{8}{12}$ (D) $\frac{7}{12}$

16. A, B are two events of a random experiment such that $P(\bar{A}) = 0.3, P(B) = 0.4$ and $P(A \cap \bar{B}) = 0.5$. Then

(A) $P(A \cup B) = 0.8$ (B) $P\left(\frac{B}{A \cup \bar{B}}\right) = 0.25$

(C) $P(\bar{A} \cup \bar{B}) = 0.2$ (D) $P(\bar{A} \cup \bar{B}) = 0.1$

17. A letter is know to have come from CHENNAI, MUMBAI, JAIPUR, AIZWAL or RAIPUR. On the post mark only two consecutive letters AI are legible. The probability that it came from JAIPUR is

(A) $\frac{11}{29}$ (B) $\frac{5}{33}$ (C) $\frac{13}{33}$ (D) $\frac{6}{29}$

18. Three unbiased dice are rolled and three numbers a,b,c on them are noted. The probability that the three planes $ax + by + cz = 0, bx + cy + az = 0$ and $cx + ay + bz = 0$

(A) Intersect along a line is 0 (B) Intersect at only one point is $\frac{105}{108}$

(C) Form a triangular prism is 0 (D) all

19. The probability that randomly chosen 3 digit number has exactly 3 factors

(A) 15 / 900 (B) 7 / 900 (C) 13 / 900 (D) 8 / 900

20. Let A and B are two independent events with $P(A) = \frac{1}{2}$ and $P(A \cup B) = \frac{2}{3}$, then probabilities the events $P(B), P(A/B)$ and $P(B^C / A)$ are in __

(A) A.P (B) G.P (C) H.P (D) None

Numerical based

21. A rod of length ℓ is broken into 3 parts at random. Then the probability that a triangle can be formed from these parts is $\frac{p}{q}$ (where G.C.D of p & q is 1) then p + q =

22. 3 boys and 2 girls stand in a queue the probability that no.of boys ahead of every girl is at least one more than no.of girls ahead of her is of the form $\frac{p}{q}$ (where p & q are relatively prime) then p + q =

23. A die has 3 faces marked with 1, 2 faces marked with 2, and 1 face marked with 3, another die has 1 face marked with 1, 2 faces marked with 2, 3 faces marked with 3, when these 2 dice are thrown, the probability of most probable throw is $\frac{p}{q}$ (where p & q are relatively prime) then 3p – q =

24. 4 identical dice are rolled then the probability that all the numbers on them are prime is $\frac{p}{q}$ (where p & q are relatively prime) then q – 8p =

25. 8 players of equal strength are participating in a knockout tournament. The probability that 2 particulars players will face each other at any time in the tournament is of the form $\frac{p}{q}$ (where p & q are relatively prime) then 4p – q =

KEY

1.	A	**2.**	A	**3.**	B	**4.**	B	**5.**	C
6.	A	**7.**	D	**8.**	D	**9.**	D	**10.**	C
11.	B	**12.**	B	**13.**	A	**14.**	A	**15.**	D
16.	B	**17.**	D	**18.**	D	**19.**	B	**20.**	A
21.	5	**22.**	3	**23.**	3	**24.**	2	**25.**	0

❇ *Wish You all the Best* ❇