

16. If $A = \{a, b, c, d\}$, then what is the number of proper subsets of A ?

~~(a)~~ 16

(b) 15

(c) 14

(d) 12

Ans: B

17. What is the number of three-digit odd numbers formed by using the digits 1, 2, 3, 4, 5, 6 if repetition of digits is allowed?

(a) 60

~~(b)~~ 108

(c) 120

(d) 216

Ans: B

18. Let $A = \begin{pmatrix} 5 & 6 & 1 \\ 2 & -1 & 5 \end{pmatrix}$. Let there exist a

matrix B such that $AB = \begin{pmatrix} 35 & 49 \\ 29 & 13 \end{pmatrix}$. What is

B equal to?

(a) $\begin{pmatrix} 5 & 1 & 4 \\ 2 & 6 & 3 \end{pmatrix}$

(b) $\begin{pmatrix} 2 & 6 & 3 \\ 5 & 1 & 4 \end{pmatrix}$

~~(c)~~ $\begin{pmatrix} 5 & 2 \\ 1 & 6 \\ 4 & 3 \end{pmatrix}$

(d) $\begin{pmatrix} 2 & 5 \\ 6 & 1 \\ 3 & 4 \end{pmatrix}$

Ans: C

19. Consider the following statements :

1. The probability that there are 53 Sundays in a leap year is twice the probability that there are 53 Sundays in a non-leap year.

2. The probability that there are 5 Mondays in the month of March is thrice the probability that there are 5 Mondays in the month of April.

Which of the statements given above is/are correct?

~~(a)~~ 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: A

20. Consider the following statements :

1. If $A' = A$, then A is a singular matrix, where A' is the transpose of A .

2. If A is a square matrix such that $A^3 = I$, then A is non-singular.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: C

21. If p times the p^{th} term of an AP is q times the q^{th} term, then what is the $(p + q)^{\text{th}}$ term equal to?

(a) $p + q$

(b) pq

(c) 1

(d) 0

Ans: D

22. A team of 8 players is to be chosen from a group of 12 players. Out of the eight players one is to be elected as captain and another as vice-captain. In how many ways can this be done?

~~(a)~~ 27720

(b) 13860

(c) 6930

(d) 495

Ans: C

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23. In tossing three coins at a time, what is the probability of getting at most one head?

(a) $\frac{3}{8}$

(b) $\frac{7}{8}$

~~(c)~~ $\frac{1}{2}$

(d) $\frac{1}{8}$

Ans: C

24. What is the sum of the coefficients of all the terms in the expansion of $(45x - 49)^4$?

(a) -256

(b) -100

(c) 100

(d) 256

Ans: D

25. Two balls are selected from a box containing 2 blue and 7 red balls. What is the probability that at least one ball is blue?

(a) $\frac{2}{9}$

(b) $\frac{7}{9}$

(c) $\frac{5}{12}$

(d) $\frac{7}{12}$

Ans: C

26. If the equation $x^2 - bx + 1 = 0$ does not possess real roots, then which one of the following is correct?

(a) $-3 < b < 3$

~~(b)~~ $-2 < b < 2$

(c) $b > 2$

(d) $b < -2$

Ans: B

27. The probability of guessing a correct answer is $\frac{x}{12}$. If the probability of not guessing the correct answer is $\frac{2}{3}$, then what is x equal to?

(a) 2

(b) 3

~~(c)~~ 4

(d) 6

Ans: C

28. If the system of equations $2x + 3y = 7$ and $2ax + (a + b)y = 28$ has infinitely many solutions, then which one of the following is correct?

(a) $a = 2b$

(b) $b = 2a$

(c) $a = -2b$

(d) $b = -2a$

Ans: B

29. If p and q are the roots of the equation $x^2 - px + q = 0$, then what are the values of p and q respectively?

~~(a)~~ 1, 0

(b) 0, 1

(c) -2, 0

(d) -2, 1

Ans: A

30. Consider the following statements related to a variable X having a binomial distribution $b_X(n, p)$:

1. If $p = \frac{1}{2}$, then the distribution is symmetrical.

2. p remaining constant, $P(X = r)$ increases as n increases.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: A

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