

ARTHI EDUCATIONAL CENTER**FULL TEST - 1,2,3,7,8-PROBABLITY**

10th Standard

Maths

Date : 14-Nov-23

Reg.No. : **Mr Deepak M.Sc.,M.A.,B.Ed.,DCA.,TET-1.,TET-2.,****Mrs Arthideepak B.E.,**

Exam Time : 03:00:00 Hrs

Total Marks : 100

30 x 1 = 30

I. ANSWER ALL QUESTIONS

- 1) If the ordered pairs $(a + 2, 4)$ and $(5, 2a + b)$ are equal then (a,b) is
 (a) $(2,-2)$ (b) $(5,1)$ (c) $(2,3)$ (d) $(3,-2)$
- 2) If 6 times of 6th term of an A.P. is equal to 7 times the 7th term, then the 13th term of the A.P. is
 (a) 0 (b) 6 (c) 7 (d) 13
- 3) Let $A = \{1, 2, 3, 4\}$ and $B = \{4, 8, 9, 10\}$. A function $f: A \rightarrow B$ given by $f = \{(1, 4), (2, 8), (3, 9), (4,10)\}$ is a
 (a) Many-one function (b) Identity function (c) One-to-one function (d) Into function
- 4) If $A = \{1, 2\}$, $B = \{1, 2, 3, 4\}$, $C = \{5, 6\}$ and $D = \{5, 6, 7, 8\}$ then state which of the following statement is true..
 (a) $(A \times C) \subset (B \times D)$ (b) $(B \times D) \subset (A \times C)$ (c) $(A \times B) \subset (A \times D)$ (d) $(D \times A) \subset (B \times A)$
- 5) The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$ is
 (a) $\frac{1}{24}$ (b) $\frac{1}{27}$ (c) $\frac{2}{3}$ (d) $\frac{1}{81}$
- 6) If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is
 (a) 4 (b) 2 (c) 1 (d) 3
- 7) Find the matrix X if $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$
 (a) $\begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$ (b) $\begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}$ (c) $\begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$ (d) $\begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$
- 8) The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to
 (a) $\frac{16}{5} \left| \frac{x^2z^4}{y^2} \right|$ (b) $16 \left| \frac{y^2}{x^2z^4} \right|$ (c) $\frac{16}{5} \left| \frac{y}{xz^2} \right|$ (d) $\frac{16}{5} \left| \frac{xz^2}{y} \right|$
- 9) For the given matrix $A = \begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$ the order of the matrix A^T is
 (a) 2×3 (b) 3×2 (c) 3×4 (d) 4×3
- 10) If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is
 (a) 1:2 (b) 1:4 (c) 1:6 (d) 1:8
- 11) The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be
 (a) 12 cm (b) 10 cm (c) 13 cm (d) 5 cm
- 12) In a hollow cylinder, the sum of the external and internal radii is 14 cm and the width is 4 cm. If its height is 20 cm, the volume of the material in it is
 (a) $5600\pi \text{ cm}^3$ (b) $1120\pi \text{ cm}^3$ (c) $56\pi \text{ cm}^3$ (d) $3600\pi \text{ cm}^3$
- 13) The total surface area of a hemi-sphere is how much times the square of its radius.
 (a) π (b) 4π (c) 3π (d) 2π
- 14) A shuttle cock used for playing badminton has the shape of the combination of
 (a) a cylinder and a sphere (b) a hemisphere and a cone (c) a sphere and a cone (d) frustum of a cone and a hemisphere
- 15) The ratio of the volumes of a cylinder, a cone and a sphere, if each has the same diameter and same height is
 (a) 1:2:3 (b) 2:1:3 (c) 1:3:2 (d) 3:1:2

- 16) The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is
 (a) 2 (b) 1 (c) 3 (d) 1.5
- 17) A frustum of a right circular cone is of height 16 cm with radii of its ends as 8 cm and 20 cm. Then, the volume of the frustum is
 (a) $3328\pi \text{ cm}^3$ (b) $3228\pi \text{ cm}^3$ (c) $3240\pi \text{ cm}^3$ (d) $3340\pi \text{ cm}^3$
- 18) If a letter is chosen at random from the English alphabets {a, b, ..., z}, then the probability that the letter chosen precedes x
 (a) $\frac{12}{13}$ (b) $\frac{1}{13}$ (c) $\frac{23}{26}$ (d) $\frac{3}{26}$
- 19) A purse contains 10 notes of Rs. 2000, 15 notes of Rs. 500, and 25 notes of Rs. 200. One note is drawn at random. What is the probability that the note is either a Rs. 500 note or Rs. 200 note?
 (a) $\frac{1}{5}$ (b) $\frac{3}{10}$ (c) $\frac{2}{3}$ (d) $\frac{4}{5}$
- 20) If $f(x) = mx + n$, when m and n are integers $f(-2) = 7$, and $f(3) = 2$ then m and n are equal to _____
 (a) -1, -5 (b) 1, -9 (c) -1, 5 (d) 1, 9
- 21) Three Numbers a, b and c will be in A.P. If and only if _____
 (a) $2b = ac$ (b) $2b = a + c$ (c) $b = (a - c) / 2$ (d) $b^2 = ac$
- 22) Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is
 (a) 5 (b) 10 (c) 15 (d) 20
- 23) A boy saves Rs. 1 on the first day Rs. 2 on the second day, Rs. 4 on the third day and so on. How much did the boy will save upto 20 days?
 (a) $2^{19} + 1$ (b) $2^{19} - 1$ (c) $2^{20} - 1$ (d) $2^{21} - 1$
- 24) $\frac{x^2+7x+12}{x^2+8x+15} \times \frac{x^2+5x}{x^2+6x+8} =$ _____
 (a) $x+2$ (b) $\frac{x}{x+2}$ (c) $\frac{35x^2+60x}{48x^2+120}$ (d) $\frac{1}{x+2}$
- 25) If $2f(x) - 3f\left(\frac{1}{x}\right) = x^2$, ($x \neq 0$) then $f(2) = ?$
 (a) $-\frac{7}{4}$ (b) $\frac{5}{2}$ (c) -1 (d) None of these
- 26) Ajay and Vijay solved an equation. In solving it, Ajay made a mistake in the constant term only and got the roots as 8 and 2, while Vijay made a mistake in the coefficient of x only and obtained roots -9 and -1. The correct roots of the equation are _____
 (a) 8, 1 (b) -9, 2 (c) -8, -2 (d) 9, 1
- 27) If $A = \begin{bmatrix} y & 0 \\ 3 & 4 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then $A^2 = 16I$ for _____
 (a) $y = 4$ (b) $y = 5$ (c) $y = -4$ (d) $y = 16$
- 28) The GCD and LCM of a and b are 27 and 2079 respectively. If a is divided by 9, the quotient is 21. Then b is _____
 (a) 243 (b) 189 (c) 113 (d) 297
- 29) If $A = \begin{bmatrix} 2 & 0 \\ 0 & 1 \end{bmatrix}$ and $f(x) = x^2 - 5x + 4I$, then $f(A) =$
 (a) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (c) $\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ (d) $\begin{bmatrix} -2 & 0 \\ 0 & 0 \end{bmatrix}$
- 30) The total surface area of a cone whose radius is $\frac{r}{2}$ and slant height 21 is _____ (sq.units)
 (a) $2\pi r(l+r)$ (b) $\pi r\left(l + \frac{r}{4}\right)$ (c) $\pi r(l+r)$ (d) $2\pi rl$

II. ANSWER ANY 10 QUESTIONS

10 x 2 = 20

31) Represent the function $f(x) = \sqrt{2x^2 - 5x + 3}$ as a composition of two functions.

32) The general term of a sequence is defined as

$$a_n = \begin{cases} n(n+3); n \in N \text{ is odd} \\ n^2 + 1; n \in N \text{ is even} \end{cases}$$

Find the eleventh and eighteenth terms.

33) A Relation R is given by the set $\{(x,y) / y = x + 3, x \in \{0, 1, 2, 3, 4, 5\}\}$. Determine its domain and range.

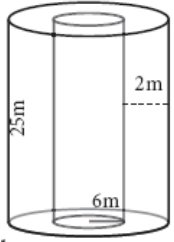
34) If x is congruent to 13 modulo 17 then $7x - 3$ is congruent to which number modulo 17?

35) Find the 15th, 24th and nth term (general term) of an A.P. given by 3, 15, 27, 39

36) Simplify

$$\frac{x(x+1)}{x-2} + \frac{x(1-x)}{x-2}$$

- 37) If one litre of paint covers 10 m^2 , how many litres of paint is required to paint the internal and external surface areas of a cylindrical tunnel whose thickness is 2 m, internal radius is 6 m and height is 25 m.



38) If $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{bmatrix}$ then verify $(A^T)^T = A$

39) Simplify

$$\frac{12t^2 - 22t + 8}{3t} \div \frac{3t^2 + 2t - 8}{2t^2 + 4t}$$

- 40) What is the probability of drawing either a king or a queen in a single draw from a well shuffled pack of 52 cards?

41) Find the surface area of the earth whose diameter is 12756 kms.

42) If $P(A) = \frac{2}{3}$, $P(B) = \frac{2}{5}$, $P(A \cup B) = \frac{1}{3}$ then find $P(A \cap B)$.

III. ANSWER ANY 10 QUESTIONS

11 x 5 = 55

43) A function $f: [-5, 9] \rightarrow \mathbb{R}$ is defined as follows:

$$f(x) = \begin{cases} 6x + 1 & \text{if } -5 \leq x < 2 \\ 5x^2 - 1 & \text{if } 2 \leq x < 6 \\ 3x - 4 & \text{if } 6 \leq x \leq 9 \end{cases}$$

Find

- $f(-3) + f(2)$
 - $f(7) - f(1)$
 - $2f(4) + f(8)$
 - $\frac{2f(-2) - f(6)}{f(4) + f(-2)}$
- 44) Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 8, 11, 14\}$ be two sets. Let $f: A \rightarrow B$ be a function given by $f(x) = 3x - 1$. Represent this function
- by arrow diagram
 - in a table form
 - as a set of ordered pairs
 - in a graphical form

45) Find the sum of

$$15^2 + 16^2 + 17^2 + \dots + 28^2$$

46) Find the sum to n terms of the series $5 + 55 + 555 + \dots$

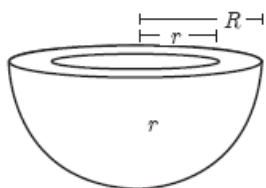
47) Find the GCD of the following by division algorithm $2x^4 + 13x^3 + 27x^2 + 23x + 7$, $x^3 + 3x^2 + 3x + 1$, $x^2 + 2x + 1$

48) If $A = \begin{bmatrix} 1 & 1 \\ -1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ -4 & 2 \end{bmatrix}$, $C = \begin{bmatrix} -7 & 6 \\ 3 & 2 \end{bmatrix}$ verify that $A(B + C) = AB + AC$

49) Find the square root of the following polynomials by division method

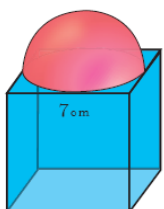
$$121x^4 - 198x^3 - 183x^2 + 216x + 144$$

50) The internal and external radii of a hollow hemispherical shell are 3 m and 5 m respectively. Find the T.S.A. and C.S.A. of the shell.



- 51) In a class of 50 students, 28 opted for NCC, 30 opted for NSS and 18 opted both NCC and NSS. One of the students is selected at random. Find the probability that
- The student opted for NCC but not NSS.
 - The student opted for NSS but not NCC.
 - The student opted for exactly one of them.

52) As shown in figure a cubical block of side 7 cm is surmounted by a hemisphere. Find the surface area of the solid.



53) The King, Queen and Jack of the suit spade are removed from a deck of 52 cards. One card is selected from the remaining cards. Find the probability of getting

(i) a diamond

(ii) a queen

(iii) a spade

(iv) a heart card bearing the number 5.

ALL THE BEST

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