Updated

BRINDHAVAN HR SEC SCHOOL,SUKKIRANPATTI
PUBLIC EXAM MODEL QUESTION PAPER 2024
10th Standard
Maths

Date : 11-Mar-24

Exam Time : 03:00:00 Hrs

Reg.No. : ☐☐☐☐☐☐

Total Marks : 100

PART- I   14 x 1 = 14

ANSWER ALL THE QUESTIONS

1) Let A = {1, 2, 3, 4} and B = {4, 8, 9, 10}. A function f: A ⟶ 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

2) The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P.

(a) 4551   (b) 10091   (c) 7881   (d) 13531

3) If 1 + 2+ 3 + . . . + 10 = 55, then, $1^3 + 2^3 + 3^3 + ... 10^3$ = ?

(a) 55^2 (b) 10^2 (c) 55^3 (d) 10^3

4) A system of three linear equations in three variables is inconsistent if their planes

(a) intersect only at a point   (b) intersect in a line

(c) coincides with each other   (d) do not intersect

5)
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 x 3   (b) 3 x 2   (c) 3 x 4   (d) 4 x 3

6) The perimeters of two similar triangles ΔABC and ΔPQR are 36 cm and 24 cm respectively. If PQ = 10 cm, then the length of AB is

(a) $6\frac{2}{3}cm$ (b) $\frac{10\sqrt{6}}{3}cm$ (c) $66\frac{2}{3}cm$ (d) 15 cm

7) A straight line has equation 8y = 4x + 21. Which of the following is true

(a) The slope is 0.5 and the y intercept is 2.6

(b) The slope is 5 and the y intercept is 1.6

(c) The slope is 0.5 and the y intercept is 1.6

(d) The slope is 5 and the y intercept is 2.6

8) (2, 1) is the point of intersection of two lines.

(a) x - y - 3 = 0; 3x - y - 7 = 0   (b) x + y = 3; 3x + y = 7

(c) 3x + y = 3; x + y = 7   (d) x + 3y - 3 = 0; x - y - 7 = 0

**kindly send me your key Answers to our email id - padasalai.net@gmail.com**

9) The electric pole subtends an angle of 30° at a point on the same level as its foot. At a second point 'b' metres above the first, the depression of the foot of the pole is 60°. The height of the pole (in metres) is equal to

(a) $\sqrt{3}$ b   (b) $\frac{b}{3}$ (c) $\frac{b}{2}$ (d) $\frac{b}{\sqrt{3}}$

10) If $\triangle ABC$ is right angled at C, then the value of cos (A + B) is _____

(a) 0   (b) 1   (c) $\frac{1}{2}$ (d) $\frac{\sqrt{3}}{2}$

11) The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is

(a) $\frac{9\pi h^2}{8}$ sq.units   (b) $24\pi h^2$ sq.units   (c) $\frac{8\pi h^2}{9}$ sq.units   (d) $\frac{56\pi h^2}{9}$ sq.units

12) lf the volume and surface area of a sphere are numerically equal then its radius is _____

(a) 2 units   (b) 3 units   (c) 4 units   (d) 5 units

13) The standard deviation of a data is 3. If each value is multiplied by 5 then the new variance is

(a) 3   (b) 15   (c) 5   (d) 225

14) What will be the probability that a non -leap year will have 53 Saturdays

(a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{6}{7}$ (d) $\frac{5}{7}$

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PART -II   10 x 2 = 20

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ANSWER ANY 10 QUESTIONS QUESTION NO.28 IS COMPULSORY

15) Let X = {1, 2, 3, 4} and Y = {2, 4, 6, 8,10} and R = {(1, 2),(2, 4),(3, 6),(4, 8)} Show that R is a function and find its domain, co-domain and range?

16) Determine whether the graph given below represent functions. Give a reason for your answer concerning the graph.
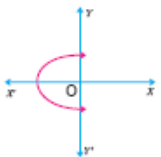
17) Compute x, such that $10^4 \equiv$ x (mod 19)

18) Find the sum to infinity of

9 + 3 + 1 + ...

19) Find the LCM of the following

5x - 10, $5x^2$ - 20

20) Construct a 3 x 3 matrix whose elements are $a_{ij} = i^2 j^2$

21) QA and PB are perpendiculars to AB. If AO = 10 cm, BO = 6 cm and PB = 9 cm. Find AQ.
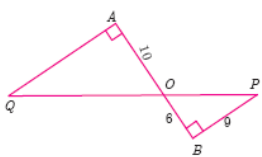

22) Find the equation of a line passing through the point (3, - 4) and having slope $\frac{-5}{7}$

23) A tower stands vertically on the ground. from a point on the ground,which is 48m away from the foot of the tower, the angel of elevation of the top of the tower is 30°.find the hieght of the tower.

24) A cylindrical drum has a height of 20 cm and base radius of 14 cm. Find its curved surface area and the total surface area.

25) A sphere, a cylinder and a cone are of the same radius, where as cone and cylinder are of same height. Find the ratio of their curved surface areas.
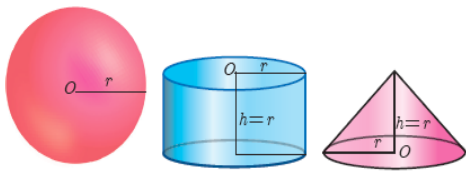
26) If the mean and coefficient of variation of a data are 15 and 48 respectively, then find the value of standard deviation.

27) If P(A) = $\frac{2}{3}$, P(B) = $\frac{2}{5}$, P(A U B) = $\frac{1}{3}$ then find P(A ∩ B).

28) Find the slope,x- intercept and y- intercept of the line 2x +3y - 6 = 0

PART -III   10 x 5 = 50

ANSWER ANY 10 QUESTIONS QUESTION NO.42 IS COMPULSORY

29) If the function f: R⟶ R defined by

$$f(x) = \begin{cases} 2x + 7, x < -2 \\ x^2 - 2, -2 \le x < 3 \\ 3x - 2, x \ge 3 \end{cases}$$

(i) f(4)
(ii) f(-2)
(iii) f(4) + 2f(1)
(iv) $\frac{f(1)-3f(4)}{f(-3)}$

30) If f(x) = x^2, g(x) = 3x and h(x) = x - 2, Prove that (f o g) o h = f o (g o h).

31) In a Geometric progression, the 4th term is $\frac{8}{9}$ and the 7th term is $\frac{64}{243}$. Find the Geometric Progression.

32) Find the sum of
$9^3 + 10^3 +.......+ 21^3$

33) Find the values of a and b if the following polynomials are perfect squares
$4x^4 - 12x^3 + 37x^2 + bx + a$

34) If the roots of (a - b)x^2 + (b - c)x + (c - a) = 0 are real and equal, then prove that b, a, c are in arithmetic progression.

35)
   If A = $\begin{bmatrix} 1 & -1 & 2 \end{bmatrix}$, B = $\begin{bmatrix} 1 & -1 \\ 2 & 1 \\ 1 & 3 \end{bmatrix}$ and C = $\begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$ show that (AB)C = A(BC)

36) P and Q are the mid-points of the sides CA and CB respectively of a △ABC, right angled at C.Prove that 4(AQ^2 + BP^2) = 5AB^2

37) Without using Pythagoras theorem, show that the vertices (1, - 4) , (2, - 3) and (4, - 7) form a right angled triangle.

38) Find the equation of a straight line Passing through (1, -4) and has intercepts which are in the ratio 2:5

39) if cot θ + tanθ = x and secθ - cosθ = y, then prove that $\left(x^2 y\right)^{\frac{2}{3}} - \left(xy^2\right)^{\frac{2}{3}} = 1$

40) An industrial metallic bucket is in the shape of the frustum of a right circular cone whose top and bottom diameters are 10 m and 4 m and whose height is 4 m. Find the curved and total surface area of the bucket.

41) Find the mean and variance of the first n natural numbers.

42) Find the number of spherical lead shots, each of diameter 6 cm that can be made from a solid cuboids of lead having dimensions 24 cm x 22 cm x 12 cm

PART -IV   2 x 8 = 16

ANSWER ALL THE QUESTIONS

43) a) Construct a $\triangle PQR$ such that QR = 6.5 cm, $\angle P = 60^{\circ}$ and the altitude from P to QR is of length 4.5 cm.

(OR)

b) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{4} > 1$)

44) a) Draw the graph of $y = x^2 + x - 2$ and hence solve $x^2 + x - 2 = 0$

(OR)

b) Draw the graph of xy = 24 , x,y > 0. Using the graph find,
(1) y when x = 3 and (ii) x when y = 6.

PREPARED BY : R.RAJESH M.Sc.,B.Ed.,PGDCA.,BT ASSISTANT (MATHS), BRINDHAVAN HR SEC SCHOOL, SUKKIRANPATTI,

PATTUKKOTTAI.PH:9942916548

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