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BRINDHAVAN HR SEC SCHOOL,SUKKIRANPATTI ,PATTUKKOTTAI

QUARTERLY EXAM 2023 MODEL QUESTION PAPER

10th Standard

Maths

Date : 22-Sep-23

Exam Time : 03:00:00 Hrs Reg.No. : ☐☐☐☐☐☐

Total Marks : 100

PART -I 14 x 1 = 14

CHOOSE THE CORRECT ANSWER

1) 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 x C) ⊂ (B x D) (b) (B x D) ⊂ (A x C) (c) (A x B) ⊂ (A x D) (d) (D x A) ⊂ (B x A)

2) Let f(x) = $\sqrt{1+x^2}$ then

(a) f(xy) = f(x).f(y) (b) f(xy) ≥ f(x).f(y) (c) f(xy) ≤ f(x).f(y) (d) None of these

3) Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are

(a) 0, 1, 8 (b) 1, 4, 8 (c) 0, 1, 3 (d) 0, 1, 3

4) If 6 times of 6^{th} term of an A.P. is equal to 7 times the 7^{th} term, then the 13^{th} term of the A.P. is

(a) 0 (b) 6 (c) 7 (d) 13

5) The solution of the system x + y − 3z = −6, −7y + 7z = 7, 3z = 9 is

(a) x = 1, y = 2, z = 3 (b) x = −1, y = 2, z = 3 (c) x = −1, y = −2, z = 3 (d) x = 1, y = -2, z = 3

6) $\frac{x}{x^2-25} - \frac{8}{x^2+6x+5}$ gives

(a) $\frac{x^2-7x+40}{(x-5)(x+5)}$ (b) $\frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$ (c) $\frac{x^2-7x+40}{(x^2-25)(x+1)}$ (d) $\frac{x^2+10}{(x^2-25)(x+1)}$

7) If △ABC is an isosceles triangle with ∠C = 90° and AC = 5 cm, then AB is

(a) 2.5 cm (b) 5 cm (c) 10 cm (d) $5\sqrt{2}$cm

8) In a △ABC, AD is the bisector ∠BAC. If AB = 8 cm, BD = 6 cm and DC = 3 cm. The length of the side AC is

(a) 6 cm (b) 4 cm (c) 3 cm (d) 8 cm

9) The slope of the line joining (12, 3), (4, a) is $\frac{1}{8}$. The value of 'a' is

(a) 1 (b) 4 (c) -5 (d) 2

10) When proving that a quadrilateral is a trapezium, it is necessary to show

(a) Two sides are parallel (b) Two parallel and two non-parallel sides

(c) Opposite sides are parallel (d) All sides are of equal length

11) If x = a tanθ and y = b secθ then

(a) $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$ (b) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ (c) $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ (d) $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$

12) The general term of $1/2, 2/3, 3/4, \ldots$ is _____

(a) $\frac{n}{n-1}$ (b) $\frac{n}{n+1}$ (c) $\frac{n}{2n+1}$ (d) $\frac{n}{2n-1}$

13) Axis of symmetry in the term of vertical line seperates parabola into _____

(a) 3 equal halves (b) 5 equal halves (c) 2 equal halves (d) 4 equal halves

14) Find the value of 'a' if the lines 7y = ax + 4 and 2y = 3 - x are parallel

(a) $\frac{7}{2}$ (b) $-\frac{2}{7}$ (c) $\frac{2}{7}$ (d) $-\frac{7}{2}$

PART - II 10 x 2 = 20

ANSWER ANY 10 QUESTIONS.QUESTION NO.28 IS COMPULSORY

15) If A x B = {(3,2), (3, 4), (5,2), (5, 4)} then find A and B.

16) Let X = {3, 4, 6, 8}. Determine whether the relation R = {(x, f(x)) | x ∈ X, f(x) = x^2 + 1}. is a function from X to N?

17) If f(x) = x^2 - 1, g(x) = x - 2 find a, if g o f(a) = 1

18) ' a ' and ' b ' are two positive integers such that a^b x b^a = 800. Find ' a ' and ' b'

19) Compute x, such that $10^4 \equiv$ x (mod 19)

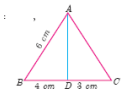
20) Find the sum to infinity of 9 + 3 + 1 + ...

21) Determine the nature of the roots for the following quadratic equations $15x^2$ + 11x + 2 = 0

22) If α, β are the roots of $7x^2$ + ax + 2 = 0 and if β - α = $\frac{-13}{7}$. Find the values of a.

23) Find the excluded values, if any of the following expressions.
$\frac{x^2+6x+8}{x^2+x-2}$

24) In the figure, AD is the bisector of ∠A. If BD = 4 cm, DC = 3 cm and AB = 6 cm, find AC.



25) Find the area of the triangle formed by the points (1, –1), (–4, 6) and (–3, –5)

26) Find the intercepts made by the line 4x − 9y + 36 = 0 on the coordinate axes.

27) prove that $\sqrt{\frac{1+cos\theta}{1-cos\theta}}$ = cosec θ + cotθ

28) Find the equation of the line passing through (1, 2) and making an angle of 30°, with y-axis.

PART - III 10 x 5 = 50

ANSWER ANY 10 QUESTIONS.QUESTION NO.42 IS COMPULSORY

29) Let A = {x ∈ W | x < 2}, B = {x ∈ N | 1 < x ≤ 4} and C = (3,5). Verify that A x (B U C) = (A x B) U (A x C)

30) 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) $\frac{f(1)-3f(4)}{f(-3)}$

31) Find x if gff(x) = fgg(x), given f(x) = 3x + 1 and g(x) = x + 3.

32) Find the HCF of 396, 504, 636.

33) The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.

34) Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm,..., 24 cm. How much area can be decorated with these colour papers?

35) Find the GCD of the polynomials $x^3 + x^2 - x + 2$ and $2x^3 - 5x^2 + 5x - 3$.

36) If A = $\frac{2x+1}{2x-1}$, B = $\frac{2x-1}{2x+1}$ find $\frac{1}{A-B} - \frac{2B}{A^2-B^2}$

37) If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square, find the values of a and b.

38) Basic Proportionality Theorem (BPT) or Thales theorem?

39) Find the area of the quadrilateral whose vertices are at (–9, –2), (–8, –4), (2, 2) and (1, –3)

40) Let A(3, - 4), B(9, - 4) , C(5, - 7) and D(7, - 7). Show that ABCD is a trapezium.

41) Find the equation of the median and altitude of Δ ABC through A where the vertices are A(6, 2), B(-5,-1) and C(1, 9)

42) If $\frac{\cos\alpha}{\cos\beta}$ = m and $\frac{\cos\alpha}{\sin\beta}$ = n, then prove that $(m^2 + n^2)\cos^2\beta = n^2$

PART - IV 2 x 8 = 16

ANSWER BOTH QUESTIONS.

43) a) 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)

(OR)

b) Construct a △PQR such that QR = 6.5 cm,∠P = 60°and the altitude from P to QR is of length 4.5 cm.

44) a) Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference of each circle as shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.

Diameter (**x**)**cm**	1	2	3	4	5
Circumference (**y**)**cm**	3.1	6.2	9.3	12.4	15.5

(OR)

b) The following table shows the data about the number of pipes and the time taken to till the same tank.

No\of pipes (x)	2	3	6	9
Time Taken (in min) (y)	45	30	15	10

Draw the graph for the above data and hence
(i) find the time taken to fill the tank when five pipes are used
(ii) Find the number of pipes when the time is 9 minutes.

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ALL THE BEST

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