

BRINDHAVAN HR SEC SCHOOL, SUKKIRANPATTI**QUARTERLY EXAM MODEL QUESTION PAPER****10th Standard****Maths**

Date : 24-09-24

Reg.No. :

Exam Time : 03:00 Hrs

Total Marks : 100

14 x 1 = 14

PART - A**CHOOSE THE CORRECT ANSWER**

- 1) If $f(x) = 2x^2$ and $g(x) = \frac{1}{3x}$, then $f \circ g$ is
 (a) $\frac{3}{2x^2}$ (b) $\frac{2}{3x^2}$ (c) $\frac{2}{9x^2}$ (d) $\frac{1}{6x^2}$
- 2) Let $f(x) = \sqrt{1+x^2}$ then
 (a) $f(xy) = f(x).f(y)$ (b) $f(xy) \geq f(x).f(y)$ (c) $f(xy) \leq f(x).f(y)$
 (d) None of these
- 3) $7^{4k} \equiv \underline{\hspace{2cm}} \pmod{100}$
 (a) 1 (b) 2 (c) 3 (d) 4
- 4) The value of $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$ is
 (a) 14400 (b) 14200 (c) 14280 (d) 14520
- 5) If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
 (a) 3 (b) 5 (c) 6 (d) 8
- 6) The solution of $(2x - 1)^2 = 9$ is equal to
 (a) -1 (b) 2 (c) -1, 2 (d) None of these
- 7) In $\triangle LMN$, $\angle L = 60^\circ$, $\angle M = 50^\circ$. If $\triangle LMN \sim \triangle PQR$ then the value of $\angle R$ is
 (a) 40° (b) 70° (c) 30° (d) 110°
- 8) If $(5, 7)$, $(3, p)$ and $(6, 6)$ are collinear, then the value of p is
 (a) 3 (b) 6 (c) 9 (d) 12
- 9) $(2, 1)$ 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) $x + 3y - 3 = 0$; $x - y - 7 = 0$
- 10) If $\sin \theta + \cos \theta = a$ and $\sec \theta + \operatorname{cosec} \theta = b$, then the value of $b(a^2 - 1)$ is equal to
 (a) $2a$ (b) $3a$ (c) 0 (d) $2ab$

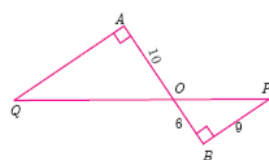
- 11) If $n(A) = p$, $n(B) = q$ then the total number of relations that exist between A and B is _____
 (a) pq (b) 2^{pq} (c) q^p (d) p^q
- 12) $44 \equiv 8 \pmod{12}$, $113 \equiv 85 \pmod{12}$, thus $44 \times 113 \equiv \underline{\hspace{2cm}} \pmod{12}$:
 (a) 4 (b) 3 (c) 2 (d) 1
- 13) For what set of values $\frac{x^2+5x+6}{x^2+8x+15}$ is underfined _____
 (a) -3, -5 (b) -5 (c) -2, -3, -5 (d) -2, -3
- 14) What can be said regarding a line if its slope is negative?
 (a) acute (b) obtuse (c) zero (d) None of these

PART - B

10 x 2 = 20

ANSWER ANY 10 QUESTIONS. QUESTION NO.28 IS COMPULSORY

- 15) If $B \times A = \{(-2,3), (-2,4), (0,3), (0,4), (3,3), (3,4)\}$ find A and B.
- 16) If $A = \{-2, -1, 0, 1, 2\}$ and $f: A \rightarrow B$ is an onto function defined by $f(x) = x^2 + x + 1$ then find B.
- 17) If $f(x) = 2x - 1$, $g(x) = \frac{x+1}{2}$, show that $f \circ g = g \circ f = x$.
- 18) 'a' and 'b' are two positive integers such that $a^b \times b^a = 800$. Find 'a' and 'b'
- 19) What is the time 100 hours after 7 a.m.?
- 20) Find the sum $3 + 1 + \frac{1}{3} + \dots \infty$
- 21) Determine the nature of the roots for the following quadratic equations
 $15x^2 + 11x + 2 = 0$
- 22) If α and β are the roots of $x^2 + 7x + 10 = 0$ find the values of $(\alpha - \beta)$
- 23) Find the excluded values, if any of the following expressions.
 $\frac{x^2+6x+8}{x^2+x-2}$
- 24) QA and PB are perpendiculars to AB. If AO = 10 cm, BO = 6 cm and PB = 9 cm. Find AQ.



- 25) Find the slope of a line joining the given points (-6, 1) and (-3, 2)
- 26) Find the equation of a line passing through the point (3, -4) and having slope $-\frac{5}{7}$

27) If the straight lines $12y = -(p + 3)x + 12$, $12x - 7y = 16$ are perpendicular then find 'p'.

28) prove that $\frac{\sec\theta}{\sin\theta} - \frac{\sin\theta}{\cos\theta} = \cot\theta$

PART - C

10 x 5 = 50

ANSWER ANY 10 QUESTIONS. QUESTION NO.28 IS COMPULSORY

29) Let $f: A \rightarrow B$ be a function defined by $f(x) = \frac{x}{2} - 1$, where $A = \{2, 4, 6, 10, 12\}$, $B = \{0, 1, 2, 4, 5, 9\}$, Represent f by

- (i) set of ordered pairs
- (ii) a table
- (iii) an arrow diagram
- (iv) a graph

30) If the function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by

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

- (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 remainder when 2^{81} is divided by 17.

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

34) Find the sum of $9^3 + 10^3 + \dots + 21^3$

35) Find the GCD of $6x^3 - 30x^2 + 60x - 48$ and $3x^3 - 12x^2 + 21x - 18$.

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) State and Prove - Angle Bisector Theorem

39) Find the area of the quadrilateral formed by the points $(8, 6)$, $(5, 11)$, $(-5, 12)$ and $(-4, 3)$.

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

41) $A(-3, 0)$, $B(10, -2)$ and $C(12, 3)$ are the vertices of ΔABC . Find the equation of the altitude through A and B .

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 - D

2 x 8 = 16

ANSWER ALL THE 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 $\triangle PQR$ such that $QR = 6.5$ cm, $\angle P = 60^\circ$ and the altitude from P to QR is of length 4.5 cm.

- 44) a) A school announces that for a certain competitions, the cash price will be distributed for all the participants equally as shown below:

No. of participants (x)	2	4	6	8	10
Amount for each participant in Rs. (y)	180	90	60	45	36

- Find the constant of variation.
- Graph the above data and hence find, how much will each participant get if the number of participants are 12.

(OR)

- b) Nishanth is the winner in a Marathon race of 12 km distance. He ran at the uniform speed of 12 km/hr and reached the destination in 1 hour. He was followed by Aradhana, Ponmozhi, Jeyanth, Sathya and Swetha with their respective speed of 6 km/hr, 4 km/hr, 3 km/hr and 2 km/hr. And, they covered the distance in 2 hrs, 3 hrs, 4 hrs and 6 hours respectively. Draw the speed-time graph and use it to find the time taken to Kaushik with his speed of 2.4 km/hr.
