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No.12, Ganesh Apartment, Trust Square Street,
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ISO 9001:2015 Certified Institution
10TH STD MATHEMATICS

QUARTERLY EXAM MODEL QUESTION PAPER (1) – 2026 & 27

PART - I

I. Answer all of the following:

14x1=14

- If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is -----
a) 1 b) 2 c) 3 d) 6
- If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set B , then the number of elements in B is
a) 3 b) 2 c) 4 d) 8
- Given $f(x) = (-1)^x$ is a function from N to Z , then the range of f is -----
a) $\{1\}$ b) N c) $\{1, -1\}$ d) Z
- The sum of the exponents of the prime factors in the prime factorization of 1729 is -----
a) 1 b) 2 c) 3 d) 4
- $7^{84} \equiv$ ----- (mod 100)
a) 1 b) 2 c) 3 d) 4
- 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
- Graph of a linear equation is a -----
a) straight line b) circle c) parabola d) hyperbola
- If $ax^2 + bx + c = 0$ has equal roots, then c is equal to -----
a) $b^2/2a$ b) $b^2/4a$ c) $-b^2/2a$ d) $-b^2/4a$
- If in triangle ABC and EDF , $AB/DE = BC/FD$, then they will be similar, when
a) $\angle B = \angle E$ b) $\angle A = \angle D$ c) $\angle B = \angle D$ d) $\angle A = \angle F$
- In a $\triangle ABC$, AD is the bisector of $\angle BAC$. If $AB = 8\text{cm}$, $BD = 6\text{cm}$ and $DC = 3\text{cm}$ the length of the side AC is -----
a) 6cm b) 4cm c) 3cm d) 8cm
- The area of triangle formed by the points $(-5, 0)$, $(0, -5)$ and $(5, 0)$ is -----
a) 0 sq.units b) 25 sq.units c) 5 sq.units d) none of these
- If slope of the line PQ is $1/\sqrt{3}$ then slope of the perpendicular bisector of PQ is -----
a) $\sqrt{3}$ b) $-\sqrt{3}$ c) $1/\sqrt{3}$ d) 0
- $\tan\theta \operatorname{cosec}^2\theta - \tan\theta$ is equal to -----
a) $\sec\theta$ b) $\cot^2\theta$ c) $\sin\theta$ d) $\cot\theta$
- If $5x = \sec\theta$ and $5/x = \tan\theta$, then $x^2 - 1/x^2$ is equal to -----
a) 25 b) $1/25$ c) 5 d) 1

PART - II

II. Answer any 10 questions. Question No.28 is compulsory.

10x2=20

- A Relation R is given relations by the set $\{(x, y) / y = x + 3, x \in \{0, 1, 2, 3, 4, 5\}\}$. Determine its domain and range.
- Given the function $f: x \rightarrow x^2 - 5x + 6$, evaluate (i) $f(-1)$ (ii) $f(2)$
- If $13824 = 2^a \times 3^b$ then find a and b .
- If $1^3 + 2^3 + 3^3 + \dots + k^3 = 44100$ then find $1+2+3+\dots+k$.
- Reduce lowest form of: $(x^2 - 16) / (x^2 + 8x + 16)$
- If the difference between a number and its reciprocal is $24/5$, Find the number.
- Determine the nature of roots of: $9x^2 - 24x + 16 = 0$.
- If $\triangle ABC$ is similar to $\triangle DEF$ such that $BC = 3\text{cm}$, $EF = 4\text{cm}$ and area of $\triangle ABC = 54\text{cm}^2$. Find the area of $\triangle DEF$.
- Check whether AD is bisector of $\angle A$ of $\triangle ABC$, $AB = 5\text{cm}$, $AC = 10\text{cm}$, $BD = 1.5\text{cm}$ and $CD = 3.5\text{cm}$.
- Find the slope of a line joining the points $(14, 10)$ and $(14, -6)$.
- Find the equation of line passing through the point $(3, -4)$ and having slope: $-5/7$.
- If the straight lines $12y = -(P+3)x + 12$, $12x - 7y = 16$ are perpendicular then find P .
- Prove that $\sin\theta / (1 - \cos\theta) = \operatorname{cosec}\theta + \cot\theta$
- If a, b, c are in A.P. then prove that $1/bc, 1/ca, 1/ab$ are also in A.P.

PART - III

III. Answer the following any 10 questions. Q.No.42 is compulsory.

(10x5=50)

- Let $A = \{x \in W / x < 2\}$, $B = \{x \in N / 1 < x \leq 4\}$ and $C = \{3, 5\}$.
Verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$.
- 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
(i) arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) a graph
- If $f(x) = x - 1$, $g(x) = 3x + 1$ and $h(x) = x^2$, then prove that $fo(goh) = (fog)oh$
- Find the HCF of 396, 504 and 636.
- Find the sum of all natural numbers between 300 and 600 which are divisible by 7.
- Find the sum to n terms of the series $3 + 33 + 333 + \dots$
- Solve the following system of linear equations in three variables:
 $x + y + z = 5$; $2x - y + z = 9$; $x - 2y + 3z = 16$
- If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square, find the values of a and b .
- The roots of the equation $x^2 + 6x - 4 = 0$ are α, β . Find the quadratic equation whose roots are α^2 and β^2 .
- State and prove Thales Theorem.
- Find the area of the quadrilateral whose vertices are $(-9, -2)$, $(-8, -4)$, $(2, 2)$ and $(1, -3)$.
- Find the equation of the median of $\triangle ABC$ through A where the vertices are $A(6, 2)$, $B(-5, -1)$ and $C(1, 9)$.
- If $\cos\theta / (1 + \sin\theta) = 1/a$, then prove that $(a^2 - 1) / (a^2 + 1) = \sin\theta$
- Find the equation of a line passing through the point of intersection of the lines $4x + 7y - 3 = 0$ and $2x - 3y + 1 = 0$ that has equal intercepts on the axes.

PART - IV

IV. Answer all of the following.

(2x8=16)

43. a) Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle ABC (scale factor $\frac{6}{5} > 1$)

(OR)

b) Construct a triangle PQR such that $QR = 5\text{cm}$, $\angle P = 30^\circ$ and the altitude from P to QR is of length 4.2cm.

44. a) Varshika draw 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 6cm.

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

(OR)

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

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QUARTERLY EXAM MODEL QUESTION PAPER (2) – 2026 & 27

PART - I

I. Answer all of the following:

14x1=14

- If $f: A \rightarrow B$ is a bijective function and if $n(B)=7$ then $n(A)$ is equal to
a) 7 b) 49 c) 71 d) 14
- If $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is
a) linear b) cubic c) reciprocal d) quadratic
- Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is
a) 3 b) 5 c) 8 d) 11
- The next term of the sequences $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{12}$, $\frac{1}{18}$,
a) $\frac{1}{24}$ b) $\frac{1}{27}$ c) $\frac{2}{3}$ d) $\frac{1}{81}$
- $\frac{(x+3)}{(x^3-1)} - \frac{(3x+1)}{(x^2+x+1)}$ is
a) ____ b) $3x^2 \dots / (2x^3 - 2x)$ c) $(2x^2 - 4x + 21) / 3x^3$ d) $7(y^2 - 2y + 1) / y^2$
- The value of a and b if $4x^4 - 24x^3 + 76x^2 + ax + b$ is a perfect square are
a) 100, 120 b) 10, 12 c) -120, 100 d) 12, 10
- If $\triangle ABC$ is an isosceles triangle with $\angle C = 90^\circ$ and $AC = 5\text{cm}$ then AB is
a) 2.5cm b) 5cm c) 10cm d) $5\sqrt{2}\text{ cm}$
- a $\triangle ABC$, AD is the bisector of $\angle BAC$, if $AB = 8\text{cm}$, $BD = 6\text{cm}$, and $DC = 3\text{cm}$, The Length of the side AC
a) 6cm b) 4cm c) 3 cm d) 8 cm
- The Point of intersection of $3x - y = 4$ and $x + y = 8$ is
a) (5,3) b) (2,4) c) (3,5) d) (4,4)
- (2,11) 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) $x + 3y - 3 = 0$, $x - y - 7 = 0$
- The slope of an equation $y = 14x$ is
a) $1/14$ b) $-1/14$ c) 14 d) -14
- $\tan \theta \operatorname{cosec}^2 \theta - \tan \theta$ is equal to
a) $\sec \theta$ b) $\cot^2 \theta$ c) $\sin \theta$ d) $\cot \theta$
- If $5x = \sec \theta$ and $5/x = \tan \theta$, then $x^2 - 1/x^2$ is equal to
a) 25 b) $1/25$ c) 5 d) 1
- $(\sin \theta - \sin^3 \theta) / (\cos \theta - \cos^3 \theta) = ?$
a) $\tan^2 \theta$ b) $\cot^2 \theta$ c) $\tan \theta$ d) $\cot \theta$

PART - II**II. Answer any 10 questions. Question No.28 is compulsory.****10x2=20**

15. Let $A = \{1,2,3\}$ $B = \{x / x \text{ is a prime number less than } 10\}$. Find $A \times B$ and $B \times A$
16. Let $A = \{1,2,3,4\}$ and $B = \mathbb{N}$. Let $f: A \rightarrow B$ be defined by $f(x) = x^3$. Then find the range of f .
17. Compute x such that $10^4 \equiv x \pmod{19}$
18. In a G.P 729, 243, 81, find t_7
19. Find the Sum of $3 + 6 + 9 + \dots + 96$
20. Find the L.C.M of $9a^3b^2$, $12a^2b^2c$
21. Find the excluded value of $t / (t^2 - 5t + 6)$
22. Simplify: $x^2 / (x - y) + y^2 / (y - x)$
23. If $\triangle ABC \sim \triangle DEF$ Such that area of $\triangle ABC$ is 9 cm^2 and the area of $\triangle DEF$ is 16 cm^2 and $BC = 2.1 \text{ cm}$, find the length of EF .
24. Find the area of a triangle formed by points: $(1,-1)$, $(-4,6)$, $(-3,-5)$
25. Find the intercepts made by the line $4x - 9y + 36 = 0$ on the coordinate axes.
26. Calculate the slope and y intercept of the straight line $8x - 7y + 6 = 0$
27. Prove that $\sin A / (1 + \cos A) = (1 - \cos A) / \sin A$
28. Find the 3rd and 4th term of a Sequences if $a_n = \{n^2, n \text{ is odd}; n^3, n \text{ is even}\}$

PART - III**III. Answer the following any 10 questions. Q.No.42 is compulsory.****(10x5=50)**

29. Given $A = \{1,2,3\}$ $B = \{4,5,6\}$ $C = \{5,6,7\}$ and $D = \{1,3,5\}$
Check if $(A \cap C) \times (B \cap D) = (A \times B) \cup (C \times D)$ is true.
30. If the function f is defined by $f(x) = \begin{cases} 2x + 7; & x < 0; \\ x^2 - 2; & -2 \leq x < 3; \\ 3x - 2; & x > 3 \end{cases}$
Then find the value of i) $f(4)$ ii) $f(-2)$ iii) $f(4) + 2f(1)$ iv) $f(1) - 2f(4)$
31. If $f(x) = \{2x + 3\}$, $g(x) = -2x$, $h(x) = 3x$ Then prove that $f \circ (g \circ h) = (f \circ g) \circ h$
32. Find x , y and z given that the numbers x , 10 , y , 24 , z are in AP
33. Use Euclid's division Algorithm to find the HCF of 84 , 90 and 120
34. If nine times ninth term is equal to the fifteen times fifteenth term, Show that six times twenty fourth term is zero.
35. Find the square root of $64x^4 - 16x^3 + 17x^2 - 2x + 1$
36. Solve. $x - 2y + 3z = 16$; $x + y + z = 5$; $2x - y + z = 9$
37. If α, β are the roots of the equation $3x^2 + 7x - 2 = 0$, Find the value of
i) $\alpha/\beta + \beta/\alpha$ ii) $\alpha^2/\beta + \beta^2/\alpha$
38. Prove that $(\sin^3 A + \cos^3 A) / (\sin A + \cos A) + (\sin^3 A - \cos^3 A) / (\sin A - \cos A) = 2$
39. A line makes Positive intercepts on coordinate axes whose sum is 7 and it passes through $(-3,8)$ Find equation.
40. Find the area of a quadric lateral whose vertices are $(-9,6)$, $(-8,6)$, $(-1,2)$ and $(-6,-3)$
41. Find the equation of the perpendicular bisector of the line joining the points $A(-4,2)$ and $B(6,-4)$
42. State and Prove that Thales Theorem

PART - IV**IV. Answer all of the following.****(2x8=16)**

43.a) Construct a triangle similar to a given triangle ABC with its sides equal to $6/5$ of the corresponding sides of the triangle ABC (scale factor $7/3 > 1$)

(OR)

b) Construct a triangle PQR such that $QR = 5\text{cm}$, $\angle P = 30^\circ$ and the altitude from P to QR is of length 4.2cm .

44. a) Graph the linear function $y = 1/2 x$ and identify the constant of variation

find. (i) y when $x = 9$ and (ii) x when $y = 7.5$

(OR)

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

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QUARTERLY EXAM MODEL QUESTION PAPER (3) – 2026 & 27

PART - I

I. Answer all of the following:

14x1=14

- If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set B . Then the number of elements in B is
a) 3 b) 2 c) 4 d) 8
- Let $A = \{1, 2, 3, 4\}$, $B = \{4, 8, 9, 10\}$. 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
- Let $f(x) = \sqrt{1+x^2}$ then
a) $f(xy) = f(x) \cdot f(y)$ b) $f(xy) \geq f(x) \cdot f(y)$ c) $f(xy) \leq f(x) \cdot f(y)$ d) None of these
- If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \dots + 2^0$, which of the following is true?
a) B is 2^{64} more than A b) A and B are equal
c) B is larger than A by 1 d) A is larger than B by 1
- 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
- Graph of a linear equation is a -----
a) straight line b) circle c) parabola d) hyperbola
- The number of excluded values for the expression -----
a) 1 b) 2 c) 3 d) 4
- $\triangle ABC$, AD is the bisector of $\angle BAC$, if $AB = 8\text{cm}$, $BD = 6\text{cm}$, and $DC = 3\text{cm}$, The Length of the side AC
a) 6cm b) 4cm c) 3 cm d) 8 cm
- In a given figure $ST \parallel QR$, $PS = 2\text{cm}$ and $SQ = 3\text{cm}$. Then the ratio of the area of $\triangle PQR$ to area of $\triangle PST$
a) 25 : 4 b) 25 : 7 c) 25 : 11 d) 25 : 13
- If slope of the line PQ is $1/\sqrt{3}$, then slope of the perpendicular bisector of PQ is
a) $\sqrt{3}$ b) $-\sqrt{3}$ c) $1/\sqrt{3}$ d) 0
- The Area of Quadrilateral formed by points (a, a) , $(-a, a)$, $(-a, -a)$, $(a, -a)$ is 64sq.units. What is the value of a
a) 4 b) 6 c) 8 d) 12
- $(2, 1)$ 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) $x + 3y - 3 = 0$; $x - y - 7 = 0$
- $12. \tan \theta \operatorname{cosec}^2 \theta - \tan \theta$ is equal to
a) $\sec \theta$ b) $\cot^2 \theta$ c) $\sin \theta$ d) $\cot \theta$

$$14. (\sin \theta - \sin^3 \theta) / (\cos \theta - \cos^3 \theta) = ?$$

- a) $\tan^2 \theta$ b) $\cot^2 \theta$ c) $\tan \theta$ d) $\cot \theta$

PART - II

II. Answer any 10 questions. Question No.28 is compulsory.

10x2=20

- Define identity function.
- If $A = \{1, 3, 5\}$ $B = \{2, 3\}$ then (i) find $A \times B$ and $B \times A$.
- Find K if $f \circ f(k) = 5$ where $f(k) = 2k - 1$.
- Find the least positive value of x such that $5x \equiv 4 \pmod{6}$.
- If $1 + 2 + 3 + \dots + n = 666$ then find n .
- Find the L.C.M of $9a^3b^2$, $12a^2b^2c$
- Find the sum and product of the roots of the quadratic equation $3y^2 - y - 4 = 0$.
- If the difference between a number and its reciprocal is $24/5$, find the number.
- In the figure $DE \parallel AC$ and $DC \parallel AP$, Prove that $BE/EC = BC/CP$
- Find the value of 'a' for which the given points are collinear $(2, 3)$, $(4, a)$ and $(6, -3)$.
- A cat is located at the point $(-6, -4)$ in xy plane. A bottle of milk is kept at $(5, 11)$. The cat wishes to consume the milk travelling through shortest possible distance. Find the equation of the path it needs to take its milk.
- Find the equation of a straight line which is parallel to the line $3x - 7y = 12$ and passing through the point $(6, 4)$.
- Prove that $\sqrt{[(1 + \sin \theta) / (1 - \sin \theta)]} = \sec \theta + \tan \theta$
- If an A.P. has $a = -10$, $d = 2$, how many terms are needed to reach the term 0?

PART - III

III. Answer the following any 10 questions. Q.No.42 is compulsory.

(10x5=50)

- Let $A =$ The set of all natural numbers less than 8, $B =$ The set of all prime numbers less than 8, $C =$ The set of even prime numbers. Verify that $(A \cap B) \times C = (A \times C) \cap (B \times C)$.
- If the function f is defined by

$$f(x) = \begin{cases} 2x + 7; & x < 0; \\ x^2 - 2; & -2 \leq x < 3; \\ 3x - 2; & x > 3 \end{cases}$$
 Then find the value of i) $f(4)$ ii) $f(-2)$ iii) $f(4) + 2f(1)$ iv) $f(1) - 2f(4)$
- If $f(x) = 2x + 3$, $g(x) = 1 - 2x$ and $h(x) = 3x$. Prove that $f \circ (g \circ h) = (f \circ g) \circ h$.
- Find the HCF of 396, 504, 636.
- The sum of first n , $2n$ and $3n$ terms of an A.P. are S_1 , S_2 and S_3 respectively. Prove that $S_3 = 3(S_2 - S_1)$.
- Find the values of m and n if the polynomial is a perfect square: $36x^4 - 60x^3 + 61x^2 - mx + n$.
- Solve: $pq x^2 - (p + q)^2 x + (p + q)^2 = 0$.
- State and prove Basic Proportionality Theorem.
- Find the area of the quadrilateral whose vertices are at $(-9, -2)$, $(-8, -4)$, $(2, 2)$ and $(1, -3)$.
- Find the equation of a straight line through the point of intersection of the lines $8x + 3y = 18$, $4x + 5y = 9$ and bisecting the line segment joining the points $(5, -4)$ and $(-7, 6)$.
- A mobile phone is put to use when the battery power is 100%. The percent of battery power 'y' (in decimal) remaining after using the mobile phone for x hours is assumed as $y = -0.25x + 1$.

(i) Find the number of hours elapsed if the battery power is 40%

(ii) How much time does it take so that the battery has no power?

40. A man joined a company as Assistant Manager. The company gave him a starting salary of ₹60,000 and agreed to increase his salary by 5% annually. What will be his salary after 5 years?

41. Prove that $\sin^2 A \cos^2 B + \cos^2 A \sin^2 B + \cos^2 A \cos^2 B + \sin^2 A \sin^2 B = 1$.

42. If $f(x) = x^4 - 1$, $g(x) = x^2 - 1$ verify that $f(x) \times g(x) = \text{LCM}(f(x), g(x)) \times \text{GCD}(f(x), g(x))$.

PART - IV

IV. Answer all of the following.

(2x8=16)

43. a) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{3} > 1$).

(OR)

b) Draw a triangle ABC of base BC = 8cm, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC at D such that BD = 6cm.

44. a) A company initially started with 40 workers to complete the work by 150 days. Later it decided to fasten up the work by increasing the number of workers as shown below:

Number of workers (x)	40	50	60	75
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Number of days (y)	150	120	100	80
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(i) Graph the above data and identify the type of variation.

(ii) From the graph find the number of days required to complete the work if the company decides to opt for 120 workers.

(iii) If the work has to be completed by 200 days, how many workers are required?

(OR)

b) A garment shop announces a flat 50% discount on every purchase of items for their customers.

Draw the graph for the relation between the marked price and the discount. Hence find:

(i) the marked price when a customer gets a discount of ₹3250 (from graph)

(ii) the discount when the marked price is ₹2500.

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10TH STD MATHEMATICS

QUARTERLY EXAM MODEL QUESTION PAPER (4) – 2026 & 27

PART - I

I. Answer all of the following:

14x1=14

- 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) $(3, -2)$
- $f(x) = 2x^2$ and $g(x) = 1/3x$, then $g \circ f = ?$
(A) $3/2x^2$ (B) $2/3x^2$ (C) $2/9x^2$ (D) $1/6x^2$
- The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
(A) 2025 (B) 5220 (C) 5025 (D) 2520
- In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120.
(A) 6 (B) 7 (C) 8 (D) 9
- The square root of $(256x^8y^4z^{10}) / (25x^6y^6z^6)$ is equal to
(A) $(16/5) * (x^2z^4/y^2)$ (B) $16 * \sqrt{(y^2/x^2z^4)}$ (C) $(16/5) * (y/xy^2)$ (D) $(16/5) * (xz^2/y)$
- The solution of $(2x - 1)^2 = 9$ is equal to
(A) -1 (B) 2 (C) -1, 2 (D) None of these
- $\sqrt{(a^2x^2 + 2abx + b^2)} = ?$
(A) $|ax + b|$ (B) $|a^2x + b|$ (C) $(ax + b)^2$ (D) $|ax - b|$
- If $\triangle ABC$ is an isosceles triangle with $\angle C = 90^\circ$ and $AC = 5$ cm, then AB is
(A) 2.5 cm (B) 5 cm (C) 10 cm (D) $5\sqrt{2}$ cm
- If in $\triangle ABC$, $DE \parallel BC$, $AB = 3.6$ cm, $AC = 2.4$ cm and $AD = 2.1$ cm then the length of AE is
(A) 1.4 cm (B) 1.8 cm (C) 1.2 cm (D) 1.05 cm
- The point of intersection of $3z - y = 4$ and $z + y = 8$ is
(A) (5,3) (B) (2,4) (C) (3,5) (D) (4,4)
- The straight line given by the equation $x = 11$
(A) Parallel to X axis (B) Parallel to Y axis
(B) passing through the origin (D) passing through the point (0,11)
- If slope of the line PQ is $1/\sqrt{3}$ then slope of the perpendicular bisector of PQ is
(A) $\sqrt{3}$ (B) $-\sqrt{3}$ (C) $1/\sqrt{3}$ (D) 0
- The value of $\sin^2\theta + 1/(1 + \tan^2\theta)$ is equal to
(A) $\tan^2\theta$ (B) 1 (C) $\cot^2\theta$ (D) 0
- If $x = a \tan\theta$ and $y = b \sec\theta$ then
(A) $y^2/b^2 - x^2/a^2 = 1$ (B) $x^2/a^2 - y^2/b^2 = 1$ (C) $x^2/a^2 + y^2/b^2 = 1$ (D) $x^2/a^2 - y^2/b^2 = 0$

PART - II

II. Answer any 10 questions. Question No.28 is compulsory.

10x2=20

- Find $A \times B$, $A = (2, -2, 3)$ and $B = (1, -4)$
- Define identity function.
- 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.
- The duration of flight travel from Chennai to London through British Airlines is approximately 11 hours. The airplane begins its journey on Sunday at 23:30 hours. If the time at Chennai is four and half hours ahead to that of London's time, then find the time at London, when will the flight lands at London Airport.
- Find the 19th term of an A.P. -11, -15, -19.
- Find the excluded values, if any of the following expressions. $(x^2 + 6x + 8) / (x^2 + x - 2)$
- Find the LCM of the following $x^3 - 27$, $(x - 3)^2$, $x^2 - 9$
- Determine the nature of roots for the following quadratic equations $2x^2 - 2x + 9 = 0$
- If $\triangle ABC$ is similar to $\triangle DEF$ such that $BC = 3$ cm, $EF = 4$ cm and area of $\triangle ABC = 54$ cm². Find the area of $\triangle DEF$.
- In $\triangle ABC$, D and E are points on the sides AB and AC respectively such that $DE \parallel BC$ (i) If $AD/DB = 3/4$ and $AC = 15$ cm find AE
- Show that the points $(-2, 5)$, $(6, -1)$ and $(2, 2)$ are collinear.
- Find the equation of a straight line passing through $(5, -3)$ and $(7, -4)$.
- Prove the following identities. $\sqrt{(1 + \sin\theta) / (1 - \sin\theta)} = \sec\theta + \tan\theta$
- If the straight lines $x - 2y + 3 = 0$ and $6x + my + 8 = 0$ are perpendicular each other then find 'm'

PART - III

III. Answer the following any 10 questions. Q.No.42 is compulsory.

(10x5=50)

- Let $A = \{x \in \mathbb{N} \mid 1 < x < 4\}$, $B = \{x \in \mathbb{W} \mid 0 \leq x < 2\}$ and $C = \{x \in \mathbb{N} \mid x < 3\}$
Then verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$
- If the function f is defined by $f(x) = \begin{cases} 6x + 1; & -5 \leq x < 2; \\ 5x^2 - 1; & 2 \leq x < 6 \\ 3x - 4; & 6 \leq x \leq 9 \end{cases}$
Then find the value of a) $2f(4) + f(8)$ b) $[2f(-2) - f(6)] / [f(4) + f(-2)]$
- If $f(x) = x^2$, $g(x) = 3x$ and $h(x) = x - 2$, Prove that $(f \circ g) \circ h = f \circ (g \circ h)$.
- Find the sum of all natural numbers between 300 and 600 which are divisible by 7.
- 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?
- Find the sum to n terms of the series $5 + 55 + 555 + \dots$
- Find the values of a and b if the following polynomials are perfect squares
 $ax^4 + bx^3 + 361x^2 + 220x + 100$
- If α and β are the roots of $z^2 + 7z + 10 = 0$ find the values of
(i) $(\alpha - \beta)$ (ii) $\alpha^2 + \beta^2$ (iii) $\alpha/\beta + \beta/\alpha$
- State and prove 'BASIC PROPORTIONALITY THEOREM'
- Find the area of the quadrilateral whose vertices are at $(-9, 0)$, $(-8, 6)$, $(-1, -2)$ and $(-6, -3)$

39. You are downloading a song. The percent y (in decimal form) of mega bytes remaining to get downloaded in z seconds is given by $y = 0.1x + 1$.

- find the total MB of the song.
- after how many seconds will 75% of the song gets downloaded ?
- after how many seconds the song will be downloaded completely?

40. Find the equation of a straight line through the intersection of lines $7z + 3y = 10$ and $5z - 4y = 1$ and parallel to the line $13x + 5y + 12 = 0$.

41. Prove that $[\sin A / (1 + \cos A)] + [\sin A / (1 - \cos A)] = 2\operatorname{cosec} A$

42. If $x = (a^2 + 3a - 4) / (3a^2 - 3)$ and $y = (a^2 + 2a - 8) / (2a^2 - 2a - 4)$ find the value of x^2y^2

PART - IV

IV. Answer all of the following.

(2x8=16)

43. a) Draw a triangle PQR of base QR = 6.5cm, $\angle P = 60^\circ$ and the Attitude from p to QR of length is 4.5cm

(OR)

b) Construct a triangle similar to a given triangle PQR with its sides equal to $7/3$ of the corresponding sides of the triangle PQR (scale factor $7/3 > 1$).

44. a) A garment shop announces a flat 50% discount on every purchase of items for their customers.

Draw the graph for the relation between the marked price and the discount. Hence find:

- the marked price when a customer gets a discount of ₹3250 (from graph)
- the discount when the marked price is ₹2500.

(OR)

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

No of participants (x)	2	4	6	8	10
Amount for each participants 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.

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10TH STD MATHEMATICS

QUARTERLY EXAM MODEL QUESTION PAPER (5) – 2026 & 27

PART - I

I. Answer all of the following:

14x1=14

- If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set B . Then the number of elements in B is
(A) 3 (B) 2 (C) 4 (D) 8
- $f(x) = 2x^2$ and $g(x) = 1/3x$, then $g \circ f = ?$
(A) $3/2x^2$ (B) $2/3x^2$ (C) $2/9x^2$ (D) $1/6x^2$
- The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
(A) 2025 (B) 5220 (C) 5025 (D) 2520
- In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120.
(A) 6 (B) 7 (C) 8 (D) 9
- Graph of a linear equation is a -----
(A) straight line (B) circle (C) parabola (D) hyperbola
- The solution of $(2x - 1)^2 = 9$ is equal to
(A) -1 (B) 2 (C) -1, 2 (D) None of these
- $\sqrt{(a^2x^2 + 2abx + b^2)} = ?$
(A) $|ax + b|$ (B) $|a^2x + b|$ (C) $(ax + b)^2$ (D) $|ax - b|$
- If $\triangle ABC$ is an isosceles triangle with $\angle C = 90^\circ$ and $AC = 5$ cm, then AB is
(A) 2.5 cm (B) 5 cm (C) 10 cm (D) $5\sqrt{2}$ cm
- If in $\triangle ABC$, $DE \parallel BC$, $AB = 3.6$ cm, $AC = 2.4$ cm and $AD = 2.1$ cm then the length of AE is
(A) 1.4 cm (B) 1.8 cm (C) 1.2 cm (D) 1.05 cm
- The Area of Quadrilateral formed by points (a, a) , $(-a, a)$, $(-a, -a)$, $(a, -a)$ is 64sq.units. What is the value of a _____
(A) 4 (B) 6 (C) 8 (D) 12
- The straight line given by the equation $Y = 11$
(A) Parallel to X axis (B) Parallel to Y axis
(B) passing through the origin (D) passing through the point (11, 0)
- If slope of the line PQ is $1/\sqrt{3}$ then slope of the perpendicular bisection of PQ is
(A) $\sqrt{3}$ (B) $-\sqrt{3}$ (C) $1/\sqrt{3}$ (D) 0
- The value of $\sin^2\theta + 1/(1 + \tan^2\theta)$ is equal to
(A) $\tan^2\theta$ (B) 1 (C) $\cot^2\theta$ (D) 0
- $\tan\theta \operatorname{cosec}^2\theta - \tan\theta$ is equal to
(A) $\sec\theta$ (B) $\cot^2\theta$ (C) $\sin\theta$ (D) $\cot\theta$

PART - II

II. Answer any 10 questions. Question No.28 is compulsory.

10x2=20

- Find $A \times B$, $A \times A$, $A = (2, -2, 3)$ and $B = (1, -4)$
- Find K if $f \circ f(k) = 5$ where $f(k) = 2k - 1$.
- 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.
- Find the number of term of an A.P. 3, 6, 12,111.
- Find the sum of infinity $1 + 3 + 5 + \dots$
- Find the excluded values, if any of the following expressions. $(x^2 + 6x + 8) / (x^2 + x - 2)$
- Determine the sum and product of roots for $x^2 + 3x - 28 = 0$
- Determine the nature of roots for the following quadratic equations $2x^2 - 2x + 9 = 0$.
- If $\triangle ABC$ is similar to $\triangle DEF$ such that $BC = 3$ cm, $EF = 4$ cm and area of $\triangle ABC = 54 \text{ cm}^2$.
Find the area of $\triangle DEF$.
- In $\triangle ABC$, D and E are points on the sides AB and AC respectively such that $DE \parallel BC$
(i) If $AD/DB = 3/4$ and $AC = 15$ cm find AE
- If the straight lines $x - 2y + 3 = 0$ and $6x + my + 8 = 0$ are perpendicular each other then find 'm'
- Find the slope of a line joining the points $(5, -3)$ and $(7, -4)$.
- Prove the following identities. $\sqrt{(1 + \sin\theta) / (1 - \sin\theta)} = \sec\theta + \tan\theta$
- Show that the points $(1, 2)$, $(2, 3)$ and $(3, 4)$ are collinear.

PART - III

III. Answer the following any 10 questions. Q.No.42 is compulsory.

(10x5=50)

- If the function f is defined by

$$f(x) = \begin{cases} 6x + 1; & -5 \leq x < 2; \\ 5x^2 - 1; & 2 \leq x < 6 \\ 3x - 4; & 6 \leq x \leq 9 \end{cases}$$
 Then find the value of
 a) $2f(4) + f(8)$ b) $[2f(-2) - f(6)] / [f(4) + f(-2)]$
- If $f(x) = x^2$, $g(x) = 3x$ and $h(x) = x - 2$, Prove that $(f \circ g) \circ h = f \circ (g \circ h)$.
- Find the HCF of 396, 504, 636.
- Find the sum of all natural numbers between 100 and 1000 which are divisible by 10.
- Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm24 cm. How much area can be decorated with these colour papers?
- Find the sum to n terms of the series $3 + 33 + 333 + \dots$
- Find the values of perfect squares $64x^4 - 16x^3 + 17x^2 - 2x + 1$
- If α and β are the roots of $z^2 + 7z + 10 = 0$ find the values of
 (i) $(\alpha - \beta)$ (ii) $\alpha^2 + \beta^2$ (iii) $\alpha\beta + \beta/\alpha$
- State and prove 'THALES THEOREM'
- Find the area of the quadrilateral whose vertices are at $(-9, 0)$, $(-8, 6)$, $(-1, -2)$ and $(-6, -3)$
- Prove that $\sin^2A \cos^2B + \cos^2A \sin^2B + \cos^2A \cos^2B + \sin^2A \sin^2B = 1$.
- Find the equation of a straight line through the intersection of lines $7z + 3y = 10$ and $5z - 4y = 1$ and parallel to the line $13x + 5y + 12 = 0$.
- Prove that $[\sin A / (1 + \cos A)] + [\sin A / (1 - \cos A)] = 2\operatorname{cosec} A$
- Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8,

C = The set of even prime numbers. Verify that $(A \cap B) \times C = (A \times C) \cap (B \times C)$.

PART - IV

IV. Answer all of the following.

(2x8=16)

43. a) Draw a triangle PQR of base QR = 6.5cm, $\angle P = 60^\circ$ and the Attitude from p to QR of length is 4.5cm

(OR)

b) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle PQR (scale factor $\frac{6}{5} > 1$).

44. a) A garment shop announces a flat 50% discount on every purchase of items for their customers.

Draw the graph for the relation between the marked price and the discount. Hence find:

(i) the marked price when a customer gets a discount of ₹3250 (from graph)

(ii) the discount when the marked price is ₹2500.

(OR)

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



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