

DISTRICT INSTITUTE OF EDUCATION AND TRAINING , (DIET) BANGALORE URBAN
AND
DEPARTMENT OF SCHOOL EDUCATION
DDPI (ADMIN) , BANGALORE SOUTH DISTRICT , BANGALORE

SERIES TEST (2024 - 25)

SET - 1 QUESTION PAPER

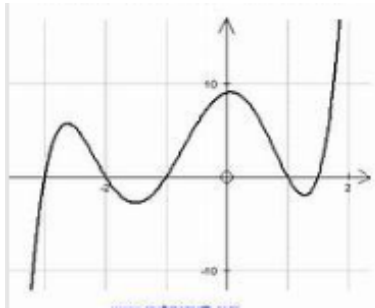
(TOPICS : REAL NUMBERS, POLYNOMIALS , PAIR OF LINEAR EQUATIONS IN TWO VARIABLES, QUADRATIC EQUATIONS)

CLASS : 10 STD SUBJECT : **MATHEMATICS** MARKS : 40 TIMINGS : 90 MIN
SUBJECT CODE : 81 - E

I Four alternatives are given for each of the following questions/ incomplete statements, only one of them is correct or more appropriate . Choose the correct alternative and write the complete answer along with its letter of alphabet. 4 X 1 = 4

- 1) If $180 = 2^x \times 3^2 \times 5$ then, the value of x is
A) 1 B) 2 C) 3 D) 4

- 2) Observe the figure ,



The number of zeroes of the polynomial is

- A) 2 B) 3 C) 4 D) 5
- 3) The graphical representation of the pair of lines $x + 2y - 4 = 0$ and $2x + 4y - 12 = 0$ is
A) Intersecting lines B) Parallel lines
C) Coincident lines D) Perpendicular lines
- 4) The roots of the quadratic equation $(x - 3)(x + 2) = 0$ are
A) -3, 2 B) 3, -2 C) -3, -3 D) 3, 2

II. Answer the following questions.

3 X 1 = 3

- 5) State Fundamental Theorem of Arithmetic.
- 6) Write the degree of the polynomial $P(x) = (x^3)^2 - 4x^4 + 2x^3 + 4x^2 + 12x + 5$
- 7) Find the value of discriminant of the quadratic equation $2x^2 - 5x - 1 = 0$ and hence write the nature of its roots.

III. Answer the following questions

4 X 2 = 8

8) Prove that $3 + 2\sqrt{6}$ is irrational .

9) Find the zeroes of the polynomial $4x^2 - 4x + 1$

OR

Construct a polynomial whose sum and product of zeroes are $\sqrt{2}$ and $\frac{1}{3}$

10) Solve the pair of linear equations by elimination method $2x + y = 8$ and $x - y = 1$

11) Find the roots of the quadratic equation $2x^2 - 5x + 3 = 0$

OR

If the quadratic equation $2x^2 - kx + 3 = 0$ has two **equal roots** then Find the value of K.

IV. Answer the following questions.

4 X 3 = 12

12) Find the LCM and HCF of 336 and 54. and verify LCM X HCF = Product of two numbers .

13) If α and β are zeroes of the polynomial, $P(x) = x^2 - 5x + 6$ Then find the value of $\alpha + \beta - 3\alpha\beta$

OR

If α and β are zeroes of the polynomial $4x^2 + 3x + 7$ Then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$

14) Prove that $\sqrt{5}$ is irrational

15) The altitude of a right angle triangle is 7 cm less than its base . If the hypotenuse is 13 cm then Find the other two sides .

IV . Answer the following questions

2 X 4 = 8

16)The sum of the numerator and the denominator of a given fraction is 12. If 3 is added to its denominator , then the fraction becomes $\frac{1}{2}$. Find the given fraction .

17) Solve the pair of linear equations graphically $2x + y = 6$ and $2x - y = 2$

V . Answer the following question .

1 X 5 = 5

18) A train travels 360 km at a uniform speed . If the speed had been 5 km/h more it would have taken 5 km/h less for the same journey. Find the speed of the train .

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SERIES TEST (2024 - 25)

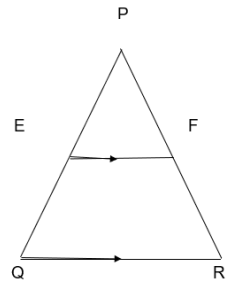
SET - 2 QUESTION PAPER

(TOPICS : Arithmetic progression, Triangles and Coordinate geometry)

CLASS : 10 STD SUBJECT : **MATHEMATICS** MARKS : 40 TIMINGS : 90 MIN
SUBJECT CODE : 81 - E

I Four alternatives are given for each of the following questions/ incomplete statements, only one of them is correct or more appropriate . Choose the correct alternative and write the complete answer along with its letter of alphabet. 4 X 1 = 4

- 1) The common difference of AP 10,7,4 is
A) 3 B)17 C) -3 D) 11
- 2) The 10th term of AP 2, 6, 10, 14is
A) 28 B) 38 C) 34 D) 29
- 3) In the given figure, EF || QR, if PE = 4, QE = 4.5, PF = 8 then RF is
A) 5 B) 5.5 C) 8.5 D) 9
- 4) The distance of the point A (4, 3) from the origin is
A) 7 units B) 25 units C) 5 units D) 6 units



II. Answer the following questions.

3 X 1 = 3

- 5) Find the sum of first 20 positive integers.
- 6) State SAS Criterion of similarity of two triangles.
- 7) Find the coordinates of the mid point of the line segment joining the points (6,2) and (4,4)

III. Answer the following questions

4 X 2 = 8

- 8) Find the sum of the first 20 terms of the arithmetic progression 5, 9, 13 ...using formula.
- 9) D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$ show that $CA^2 = CB \cdot CD$
- 10) Find the ratio in which the y-axis divides the line segment joining the points (5 - 6) and (-1 - 4)

OR

Find the coordinates of the point which divides the line segment joining the points A (1, 3) and B (2 , 7) in the ratio 3 : 4 internally.

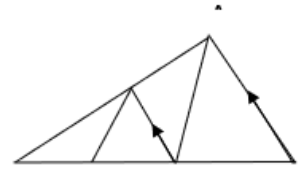
- 11) Find the value of y for which the distance between the points(2, - 3) and(10, y) is 10 units .

IV. Answer the following questions.

4 X 3 = 12

- 12) How many multiples of 4 lie between 1 and 250
- 13) If the sum of the first 14 terms of an AP is 1050 and its first term is 10. find the 20th term.

14) In the given figure $CD \parallel LA$ and $DE \parallel AC$. find the length of CL . If $BE = 4$ cm and $EC = 2$ cm



OR

A girl of height 90 cm is walking away from the base of a lamp post at a speed of

1.2 m/s . If the lamp post is 3.6 m above the ground. Find the length of her Shadow after 4 seconds.

15) The vertices of a triangle are $(-2, 0)$ $(2, 3)$ and $(1, -3)$ Is the triangle equilateral isosceles or scalene .

V . Answer the following questions

2 X 4 = 8

16) The sum of the 4th and 8th term of an arithmetic progression is 24 and the sum of the 6th and 10th term is 44. Find the first three terms of AP

17) Find the coordinates of the points of trisection of the line segment joining the points $(2, -2)$ and $(-7, 4)$

VI . Answer the following question .

1 X 5 = 5

18) State and Prove the Basic proportionality theorem.

SET -3 Question paper [2024-25] Time:1.30 hours

(Trigonometry, Some Applications of Trigonometry, Circles and Areas related to circles)

Class : 10

Mathematics

Max.Marks : 40

I. Four alternatives are given for each of the following questions/incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. 1 x 5 = 5

1. If $3 \cot A = 4$, then the value of $4 \tan A$ is—
A) 1 B) 3 C) 4 D) 2
2. $\sin 2A = 2\sin A$ is true when A is equal to —
A) 0° B) 30° C) 45° D) 60°
3. If tangents PA and PB from a point P to a circle with centre O are inclined at angle of 100° , then $\angle POA$ is equal to—
A) 40° B) 50° C) 80° D) 60°
4. Area of a sector of angle p of a circle with radius R is—
A) $\frac{p}{180} \times 2\pi R$ B) $\frac{p}{360} \times \pi R^2$ C) $\frac{p}{360} \times 2\pi R$ D) $\frac{p}{180} \times 2\pi R^2$
5. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that $OQ = 12$ cm. Length of PQ is—
A) 12 cm B) 13 cm C) 8.5 cm D) $\sqrt{119}$ cm.

II. Answer the following questions.

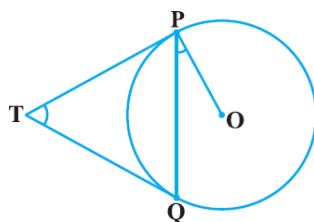
1 x 4 = 4

6. Find the length of the arc of a quadrant of radius 7 cm.
7. How many tangents can be drawn to a circle from an external point?
8. If $\tan A = \sqrt{3}$, then find the value of A .
9. Name the longest chord of a circle.

III. Answer the following questions.

2 x 4 = 8

10. In triangle ABC , right angle at B , if $\tan A = \frac{1}{\sqrt{3}}$, find the value of $\sin A \cos C + \cos A \sin C$.
11. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower, is 30° . Find the height of the tower.
12. Two tangents TP and TQ are drawn to a circle with centre O from an external point T . Prove that $\angle PTQ = 2\angle OPQ$



13. Find the area of a quadrant of a circle whose circumference is 22 cm.

IV. Answer the following questions.**3 x 5 = 15**

14. If $\tan (A + B) = \sqrt{3}$ and $\tan (A - B) = \frac{1}{\sqrt{3}}$; $0^\circ < A + B \leq 90^\circ$; $A > B$,
find A and B.
15. From a point on the ground, the angle of elevation of the bottom and top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the transmission tower.
16. Prove that “ the length of the tangents drawn from an external point to a circle are equal”.

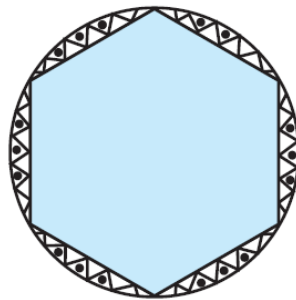
OR

Prove that “ the tangent at any point of a circle is perpendicular to the radius through the point of contact”.

17. A chord of a circle of radius 15 cm subtends an angle of 60° at the centre. Find the areas of the corresponding minor and major segments of the circle.
(Use $\pi = 3.14$ and $\sqrt{3} = 1.73$)

OR

A round table cover has six equal designs as shown in the given figure. If radius of the cover is 28 cm, find the cost of making the design at the rate of Rs.0.35 per cm^2 . (Use $\sqrt{3} = 1.7$)



18. Prove that: $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$

V. Answer the following questions.**4 x 2 = 8**

19. Prove that: $\sqrt{\frac{1 + \sin A}{1 - \sin A}} + \sqrt{\frac{1 - \sin A}{1 + \sin A}} = 2 \sec A$
20. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with uniform speed. Six seconds later, the angle of depression of the car is found to be 60° . Find the time taken by the car to reach the foot of the tower from this point.
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SET -4 Question paper [2024-25]

Time:1.30 hour

(Topics: Area and volume, Statistics, Probability)

Std : 10

Sub: Mathematics

Total Marks:40

I. Four alternatives are given for each of the following questions/incomplete statements. Choose the correct alternative and write the complete answer along with its letter of the alphabet.

1X4=4

1. Which of the following does not represent an event's probability value?

- (a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{4}{5}$ (d) $\frac{5}{5}$

2. L S A of a cylinder of height π and the radius $\frac{\pi}{2}$ is,

- (a) π (b) 2π (c) π^2 (d) π^3

3. Volume of a cone of height equal to its radius 3cm is ,

- (a) $\frac{1}{3}\pi$ (b) π (c) 3π (d) 9π

4. Volume of a sphere is ,

- (a) $\frac{4}{3}\pi r^3$ (b) $\frac{4}{3}\pi r^2$ (c) $\frac{2}{3}\pi r^3$ (d) $\frac{2}{3}\pi r^2$

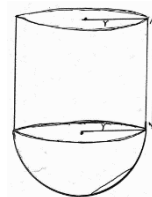
II Solve the following question :

1 X 4 =4

5. Write the empirical formula for mean, median and mode for the given data.

6. Prability of winning a game is 0.234 the what is the probability of losing it ?

7. What is the volume of the given diagram.



2 X 6 =12

8. Write the total surface area of a hallow cylinder.

III Solve the following problems :

9. A dies is thrown twice. What is the probability of that,

- (i) 5 will not come up either time a?
(ii) 5 will come up at least once ?

10. The marks obtained by 30 students of class X of a certain school in a mathematics paper consisting of 100 marks are presented in the table below. Find the mean of the marks obtained by the students.

Marks obtained (x_i)	10	20	36	40	50	56	60	70	72	80	88	92	95
No. of Students (f_i)	1	1	3	4	3	2	4	4	1	1	2	3	1

11. Suppose you drop a die at random on the rectangular region of length 3m and 2m as shown in the figure. What is the probability that will land inside the circle with diameter 1m?



12. Find the thickness of a hollow cylinder whose outer radius is 4cm and inner radius is 3cm.

13. Find the surface area of the toy which is in the form of a cone of diameter 7cm mounted on a hemisphere of same radius and the total height of the toy is 15.5 cm.

14. How much ice cream can you fill in a cone of 6cm height and the radius 3.5cm?

IV Solve :

$$3 \times 4 = 12$$

15. In a retail market, fruit vendors were selling mangoes kept in packing boxes these boxes.

Find the mean number of mangoes kept in a packing box. Using step deviation method.

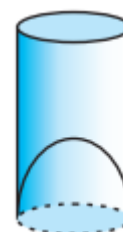
No. of mangoes	50-52	53-55	56-58	59-61	62-64
No. of Boxes	15	110	135	115	25

16. Rajeev bought 20 birthday caps for his son's birthday. Each cap is in the cone shape of height 21cm and radius 7cm. He wanted to decorate the caps with colour sheets. How much colour sheet he needs to decorate all 20 caps?

17. A survey regarding the heights (in cm) of 51 girls of Class X of a school was conducted and the following data was obtained. Find the median.

Height (in cm)	Number of girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

18. A juice seller was serving his customers using glasses as shown in Figure. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm, find the apparent capacity of the glass and its actual capacity. (Use $\pi = 3.14$.)



V Solve :

$$4 \times 2 = 8$$

19. Find mean and mode for the following data.

C-I	10-20	20-30	30-40	40-50	50-60
f	5	10	12	5	8

20. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the spherical part is 8.5 cm. By measuring the amount of water it holds, a child finds its volume to be 345 cm³. Check whether she is correct, taking the above as the inside measurements, and $\pi = 3.14$