

KENDRIYA VIDYALAYA AJMER
SECOND PRE BOARD EXAMINATION 2009-10

CLASS:- X

SUBJECT :- MATHEMATICS

Time:-3 hrs

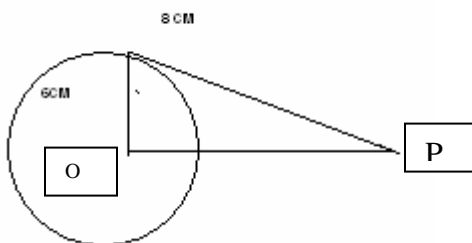
M.M.80

GENERAL INSTRUCTIONS:-

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into four sections A,B, C & D Section A comprises of 10 questions of 1 Mark each, Section B comprises of 5 questions of 2 marks each, Section C comprises of 10 questions of 3 marks each and Section D comprises of 5 questions of 6 marks each.
3. All questions in Section A are to be answered in one sentence or as per the exact requirement of the questions.
4. There is no over all choice, However an internal choice has been provided in one question of 2 marks, Three questions of 3 marks each and two questions of 6 marks each.
5. In question on construction, The drawing should be neat and exactly as per the given measurements.
6. Use of calculator is not permitted, you may ask for Mathematical tables.

SECTION :- A

- Q1. State Eudis's Division Lemma.
- Q2. Show that 5 is a zero of the polynomial $5x^2-26x+5$.
- Q3. Show that the pair of equations $9x+4y=9$, $63x+28y=45$ does not have a unique solution.
- Q4. If $\sin \theta = 3/5$, then write the value of $\tan \theta$; $0^\circ < \theta < 90^\circ$.
- Q5. If $\tan 2A = \cot(A-18^\circ)$, Where $2A$ is an acute angle, find the value of A .
- Q6. In fig. PT is a tangent to circle whose center is O. How far is P from O?



- Q7. Find the radius of the circle whose perimeter and area are numerically equal.
- Q8. Find the length of the shadow of a 12 m high tower on the level ground, when the sun's altitude (elevation) is 45° .
- Q9. From a well shuffled pack of cards, a card is drawn at random. Find the probability getting a black queen.
- Q10. If $u_i = \frac{X_i - 50}{20}$, $\sum f_i = 60$ and $\sum f_i u_i = -9$; then evaluate \bar{x} .

SECTION -B

- Q11. In an A.P., The sum of its first n terms is $n^2 + 2n$, Find its 18th term.
- Q12. Solve for x and y:

$$\frac{x+1}{2} + \frac{y-1}{3} = 8 \text{ and } \frac{x-1}{3} + \frac{y+1}{2} = 9$$
- Q13. A box contains 5 red balls, a green balls and 7 while balls. A ball is drawn at random from the box. Find the probability that the ball drawn is (a) White (b) neither red nor white.
- Q14. Find the value of K if the points A(2,3), b(4,K) and C(6,-3) are collinear.
- Q15. Find the zeroes of the quadratic polynomial $x^2 - 3$ and verify the relationship between the zeroes and the coefficients.

OR

Find the quotient and the remainder, when $x^5 - 4x^3 + x^2 + 3x + 1$ is divided by $x^3 - 3x + 1$.

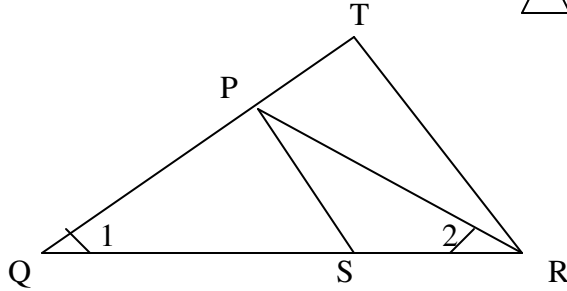
SECTION :C

- Q16. Prove that $\sqrt{3}$ is an irrational number
- Q17. Five years hence, The age of Jacob will be three times that of his son. Five years ago, Jacob's age was seven times that of his son, what are their percentages?
- Q18. Solve graphically:-
 $x + 2y + 2 = 0$; $3x + 2y - 2 = 0$.
- Q19. Construct a triangle ABC in which AB=6 Cm, BC= 5 Cm and angle ABC= 60° . also construct a triangle AB C Similar to triangle ABC, Whose each side 3 times the corresponding side of the triangle ABC.

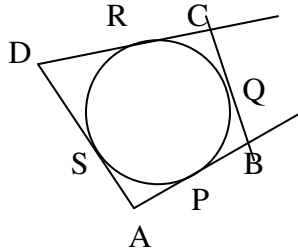
- Q20. If the diagonal of a quadrilateral divides each other proportionally. Prove that is a trapezium.

OR

In fig. $QR=QT$ and $\angle 1 = \angle 2$. Show that $\triangle PQS \sim \triangle TQR$



Q21. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB+CD=AD+BC$.



Q22. Prove that $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

OR

$$\frac{11 \sin 70^\circ - 4 \cos 53^\circ \operatorname{cosec} 37^\circ}{7 \cos 200^\circ} = \frac{7 \tan 15^\circ \tan 35^\circ \tan 75^\circ}{7}$$

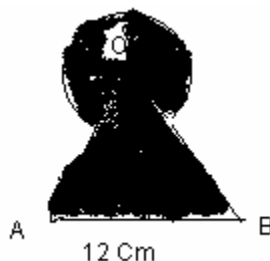
Q23. Find the ratio in which Y-axis divides the line segment joining the points (5,-6) and (-1,-4). Also find the point of intersection.

Q24. Show that the points (-2,1), (2,-2) and (5,2) are the vertices of a right triangle.

Q25. A chord of a circle of radius 10 cm subtends a right angle at the center use $\pi = 3.14$ and find (1) Area of minor sector (2) Area of major sector (3) Area of minor segment.

OR

Find the area of the shaded region where a circular arc of radius 6cm has been drawn with vertex O of an equilateral triangle OAB of side 12 Cm as center.



SECTION :D

- Q26. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides. Using the theorem, find BC if triangle ABC ~triangle DEF and their areas are respectively 64 cm^2 and 121 cm^2 ., If EF=15.4 Cm.
- Q27. A motor boat whose speed is 18 km /hr is still water takes 1 hour more to go 24 km up stream than to return downstream to the same spot. Find the speed of stream.
- Q28. Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide, From a point between them on the road, The angles of elevation of the top of the poles are 60° and 30° , respectively. Find the height of the poles and the distances of the point form the poles.
- Q29. A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius, The total height of the toy is 15.5 cm. Find volume and the total surface area of the toy.

OR

A well of diameter 3 m is dug 14 m deep. The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 4 m to form an embankment, find the height of the embankment.

- Q30. Find the mode for the following data

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	4	10	16	22	20	18	8	2

OR

Find Median for the distribution

Class	0-8	8-16	16-24	24-32	32-40	40-48
f	8	10	16	24	15	7