

**KENDRIYA VIDYALAYA SANGATHAN. ERNAKULAM REGION
MODEL QUESTION PAPER
MATHEMATICS**

**CLASS X
MAX. MARKS-90**

TIME:3 HOURS

GENERAL INSTRUCTIONS: -

- 1) All questions are compulsory.
 - 2) The questions paper consists of 30 questions divided into four sections A, B, C and D. Section A contains 8 questions of 1 mark each, Section B contains 6 questions of 2 marks each, Section C contains 10 questions of 3 marks each and Section D contains 10 questions of 4 marks each.
 - 3) There is no overall choice. However an internal choice has been provided in 1 question of 2 marks, three questions of 3 marks, and 2 questions of 4 marks each.
 - 4) In questions on construction, the drawing should be neat and exactly as per given measurements.
 - 5) Use of calculators is not allowed.
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SECTION A

1. The angle of elevation of the sun when the shadow of a pole 'h' meters high is $\sqrt{3} h$ m. long is...
A) 30° B) 45° C) 60° D) 90°
2. The perimeter of a triangle with vertices (0,4), (0,0) and (3,0) is ...
A) 5 B) 7 C) 11 D) 12
3. The roots of a quadratic equation $2x^2 - kx + k = 0$ are equal. The value of 'k' is ...
A) 0 only B) 4 C) 8 only D) 0 and 8
4. Volumes of two spheres are in the ratio 64:27. The ratio of their surface areas is ...
A) 3:4 B) 4:3 C) 9:16 D) 16:9
5. If the common difference of an A.P is 5 then the value of $a_{21} - a_6$ is ...
A) 5 B) 75 C) 15 D) 27
6. Twelve solid spheres of the same size are made by melting a solid metallic

cylinder of base diameter 2cm. and height 16cm. The diameter of each sphere is ...

- A) 4cm. B) 3cm. C) 2cm. D) 6cm.

7. If the points A (1,2) , O (0,0) and C (a ,b) are collinear, then

- A) $2a=b$ B) $a=b$ C) $a=2b$ D) $a=-b$

8. If two tangents drawn to a circle of radius 3cm. are inclined at an angle 60° , then the length of each tangent is equal to ..

- A) 6cm. B) $3\sqrt{3}$ cm. C) 3cm. D) $\frac{3\sqrt{3}}{2}$ cm.

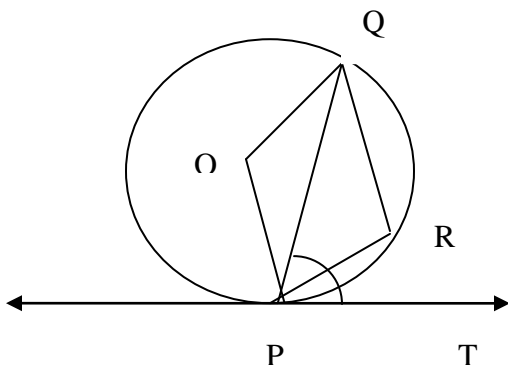
SECTION B

9. The sum of the first 'n' terms of an A.P is given by $S_n = 2n^2$. Find its 7th term.

10. Are the points A (-1,0) , B (3, 1) , C (2,2) and D (-2,1) , the vertices of a parallelogram? Verify.

11. A charity trust decided to build an anti disaster hall having a carpet area of 210 sq.m. If the length is 1 more than twice its breadth, construct the quadratic Equation to solve for the length and breadth ?
What value do you imbibe from this act?

12. In the given figure PQ, is a chord of a circle and PT is a tangent at 'p', such that angle QPT = 60° . Find the measure of angle PRQ.



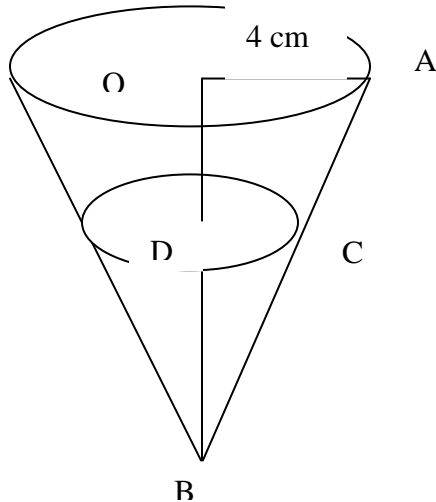
13. A die is thrown once. The probability of getting a prime number is $\frac{2}{3}$. Is it True? Justify your answer.

OR

An integer is chosen between 0 and 100. What is the probability that it is,

- a) Divisible by 7 b) Not divisible by 7

14. A cone of radius 4 cm. is divided into 2 parts by drawing a plane through the mid point of its axis and parallel to its base. Compare the volumes of the two parts



SECTION C

15. A bag contains 24 balls of which 'x' are red, 2x are white and 3x are blue. A ball is selected at random. What is the probability that it is

- a) not red b) white

16. Solve for 'x'.

$$6a^2 x^2 - 7abx - 3b^2 = 0, (a \neq 0) \text{ using quadratic formula.}$$

OR

The sum of the reciprocals of a child's age (in years), 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

17. Find the ratio in which the line $x+3y-14=0$ divided the line segment joining the Points A (-2, 4) and B (3, 7).

18. An urn contains white, black and red balls only. A ball is drawn at random from

the bag. The probability of getting a white ball is $\frac{3}{10}$ and that of a black ball is $\frac{2}{5}$. Find the probability of getting a red ball.

If the bag contains 20 black balls, then find the total number of balls in the bag..

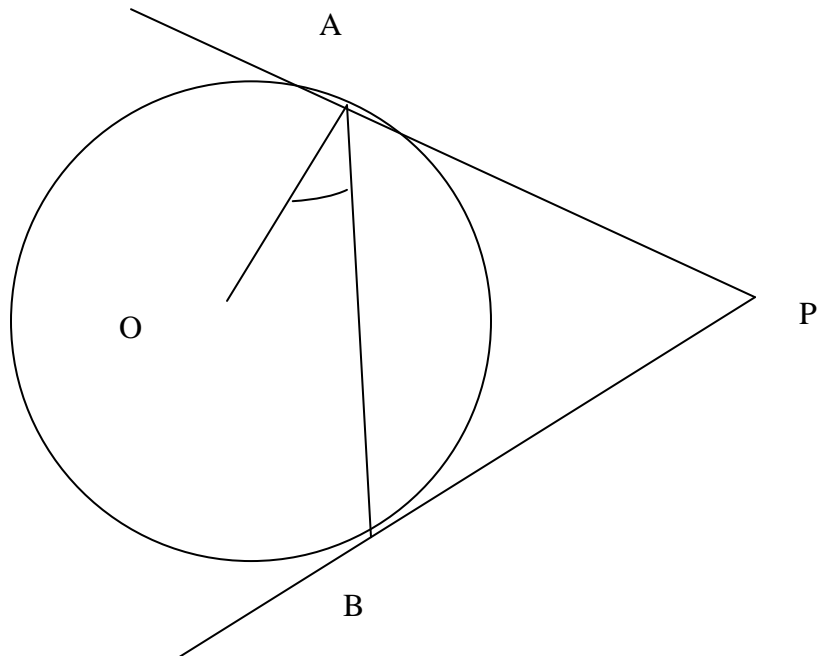
19. As New Year's resolution Ritika planned to save from her pocket money everyday. Starting from 5th January, she decided to save the amount equal to the date of the month. On 30th January, she decided to get a gift for their maid's daughter for Rs.50 and a birthday present worth Rs.100, for her grandfather. What is the amount left with her at the end of the month? What value is reflected by Ritika's gesture?

20. The sum of the first 'n' terms of an A.P is given by $4n - n^2$. Find the nth term. Find also the 10th term?

OR

How many terms of the A.P 9, 17, 25... must be added together to get 636 as the sum.

21. Two tangents PA and PB are drawn to a circle with centre 'O' from an external point 'p'. Prove that $\angle APB = 2\angle OAB$.



22. A contractor plans to install 2 slides for the children to play in a park. For the children below the age of 5 yrs., she prefers to have a slide whose top is at height of 1.5m and inclined at an \angle of 30° to the ground whereas for elder children, she wants to have a steep slide at a height of 3m and inclined at an angle of 60° to the ground. What should be the length of the slide in each case?
23. Construct a triangle with sides 3cm, 5cm and 7cm. construct another triangle whose sides are $\frac{3}{5}$ of the corresponding sides of the given triangle.
24. The area of an equilateral triangle is $49\sqrt{3} \text{ cm}^2$. Taking each vertex as centre, circles are described with radius equal to half the length of the side of the triangle. Find the area of the part of the triangles not included in the circles.
(Take $\sqrt{3}=1.73$, $\Pi=22/7$)

OR

A circular park is surrounded by a road 21m wide. If the radius of the park is 105m, find the area of the road?

SECTION D

25. An Open bucket is in the form of a frustum of cone of height 30cm with radii of its lower and upper ends as 10cm and 20cm respectively. Find the capacity and the surface area of the bucket ?
26. The 12th and the 21st terms of an A.P are 23 and 50 respectively. Find the first term and the common difference. Is 32 a term of the A.P? Determine the nth term of the A.P?
27. A well of diameter 3m and 14m deep is dug. The earth taken out of it has been evenly spread all around it in the shape of a circular ring of width 4m to form an embankment. Find the height of the embankment?
28. The angles of depression of the top and bottom of a building 50m high as observed from the top of a tower are 30° and 60° respectively. Find the height of the tower and also the horizontal distance between the building and the tower?
29. The interior of a building is in the form of a cylinder of diameter 6m and height 3.5m surmounted by a cone of the same base and height 4 m.
Find the curved surface area and volume of the interior of the building?
(Express the answer in terms of π).

OR

A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 4cm and the diameter of the base is 8cm. Determine the volume of the material used for making the toy. If a cube circumscribes the toy, then find the difference of the volumes of the cube and the toy.

30. If A (-5,7), B (-4,-5), C (-1,-6) and D (4,5) are the vertices of a quadrilateral, find the area of the quadrilateral ABCD?

31. Prove that the length of the tangents drawn from an external point to a circle is equal. Using the above theorem, prove that if quadrilateral ABCD is circumscribing a circle, then $AB+CD=AD+BC$.

32. If the price of a book is reduced by Rs.5, a person can buy 5 more books for Rs.300. Find the original list price of the book.

OR

The sum of the ages of two friends is 20 yrs. 4 yrs ago, the product of their ages was 48 yrs. Is this situation possible? If so, determine their present ages.

33. Draw a triangle ABC, with sides $BC=6\text{cm}$, $AB=5\text{cm}$, and $\angle ABC=60^\circ$, then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

34. Area of a sector of a circle of radius 36cm is $54\pi \text{ cm}^2$. Find the length of the corresponding arc of the sector?
