

KENDRIYA VIDYALAYA SANGATHAN

REGIONAL OFFICE VARANASI

SUMMATIVE ASSESMENT –II 2014-15

CLASS: X

MAX. MARKS=90

SUBJECT: MATHEMATICS (NVEQF)

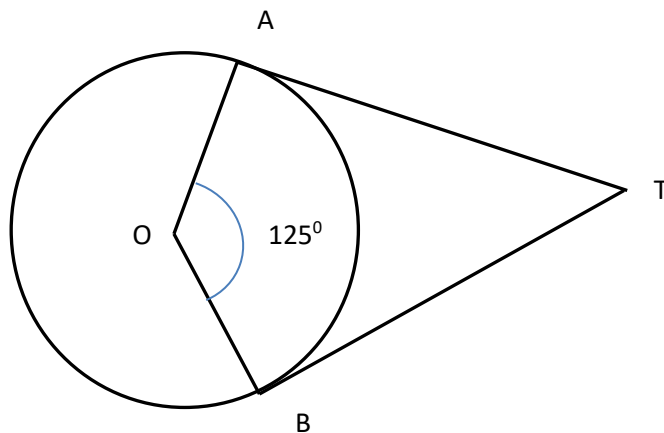
MAX.TIME: THREE HOURS

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
 2. The question paper consists of **31 questions** divided into four sections A, B, C and D. **Section A** comprises of **4 questions** of **1 mark** each, **Section B** comprises of **6 questions** of **2 marks** each. **Section C** comprises of **10 questions** of **3 marks** each and **Section D** comprises of **11 questions** of **4 marks** each.
 3. There is no overall choice.
 4. Question No. 22 is **moral value based** question.
 5. Use of calculator is not permitted.
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SECTION: A

1. In the following figure TA and TB are two tangents of a circle with centre O. If $\angle AOB = 125^\circ$ then find the value of $\angle ATB$.



2. What will be the length of the shadow of a tower of height 20 m standing on a level ground when sun's altitude is 45° ?
3. What is the condition that a quadratic equation $ax^2 + bx + c = 0$ ($a \neq 0$) has two distinct real roots?

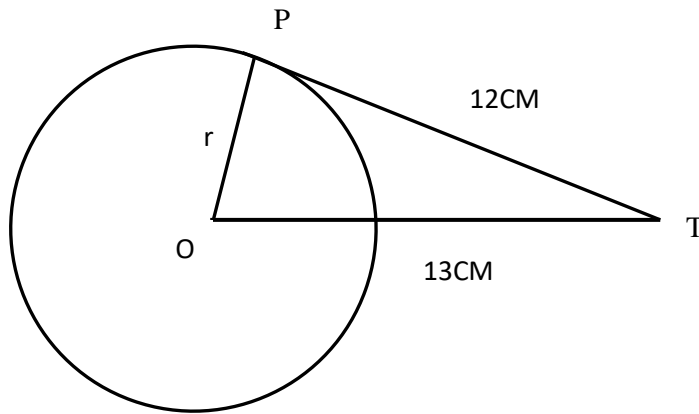
4. What is the angle made by one quadrant of a circle at the centre?

SECTION: B

5. Find the roots of the equation by factorisation –

$$x^2 + 5x - 6 = 0$$

6. In the following figure find the radius **OP** of the circle if tangent **PT =12 cm** and **OT=13cm**.



7. A contractor plans to install a slide for the children to play in the park. For this she plans a slide of height 1.5m and is inclined at an angle 30° with the ground. What is the length of the slide?

8. A chord of circle of radius 15 cm subtends an angle of 60° at the centre. Find the area of corresponding minor segment. (Given $\pi=3.14$)

9. The radii of two circles are 19 cm and 11 cm respectively. Find the radius of the circle which has circumference equal to the sum of the circumferences of the two circles.

10. Two cubes each of the volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboid.

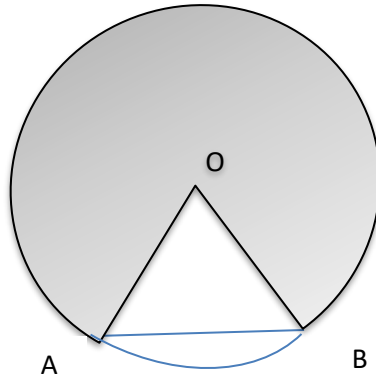
SECTION: C

11. Find two consecutive integers, sum of whose squares is 365.

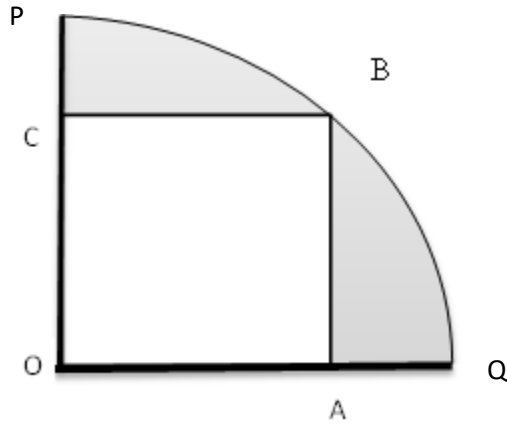
12. Obtain the roots of the following quadratic equation using quadratic formula-

$$2x^2 - 7x + 3 = 0$$

13. In the following figure the radius AO of the circle is equal to the chord AB . Find the area of the major sector shaded in the figure if $AB=4.2$ cm.



14. A tree is broken in storm in such a way that the broken part bends and touches the ground at a horizontal distance of 10m from the tree and makes an angle of 45° with the ground. Find the height of the tree before the storm. (Given that $\sqrt{2} = 1.414$).
15. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segments joining the point of contact at the centre.
16. The shadow of a tower standing on a level plane is found to be 50m longer when sun's elevation is 30° than when it is 60° . Find the height of the tower.
17. Prove that the lengths of the tangents drawn from an external point to a circle are equal.
18. The sum of two positive integers is 27 and their product is 180. Find the integers.
19. A metallic cone of height 24 cm and radius of base 6cm is melted and recast into the shape of a sphere. Find the radius of the sphere.
20. Find the area of the shaded region in the following figure if $OABC$ is a square of side 14 cm inscribed in a quadrant $OPBQ$.



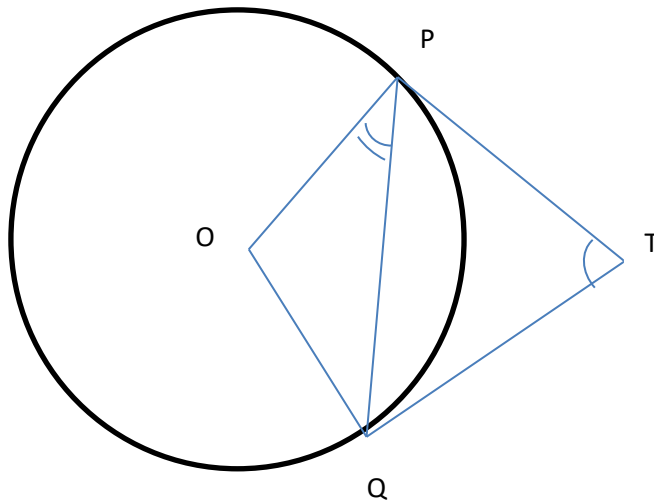
SECTION: D

21. Find the roots of the quadratic equation –

$$\frac{1}{(x+4)} - \frac{1}{(x-7)} = \frac{11}{30} \quad x \neq -4, 7$$

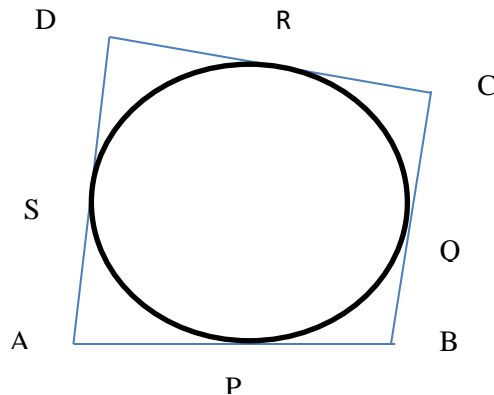
22. Cities A and B are at a distance 180 km apart on a highway. A bus goes from city A to city B with uniform speed. One day when the bus was just to start from city A an old passenger got ill and the driver took him to the nearby hospital immediately. So the bus started after 30 minute of its scheduled time. Taking care of full safety and control the driver increased the speed of the bus by 4km/h and reached city B at the scheduled time. Find the original speed of the bus. What moral values are shown by the driver?

23. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.



24. The sum of the reciprocals of Rehman's ages, (in years) three years ago and 5 years from now is $\frac{1}{3}$. Find his present age.
25. Two concentric circles are of radii 5cm and 3cm. Find the length of the chord of the larger circle which touches the smaller circle.
26. Find the volume of the frustum of the cone whose height is 12cm and radii of its lower and upper end are 3cm and 5cm.
27. 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 meter high building are 45° and 60° respectively. Find the height of the tower.
28. Find the value of k if the roots of the quadratic equation $x^2 - (k + 1)x + 4 = 0$ are equal.
29. In the figure given below ABCD is a quadrilateral drawn to circumscribe a circle. Prove that -

$$AB + CD = AD + BC$$



30. A vessel is in the shape of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14cm and total height of the vessel is 13 cm. Find the inner surface area of the vessel.

31. In the following figure ABCD is a square of side 14cm. Taking centres A, B, C and D four circles are drawn such that each circle touches externally two of the remaining three circles. Find the area of the shaded region.

