

SUMMATIVE ASSESSMENT – II, 2015, MATHEMATICS, Class – X

SAMPLE QUESTION PAPER

JST201503

Time allowed: 3 hours

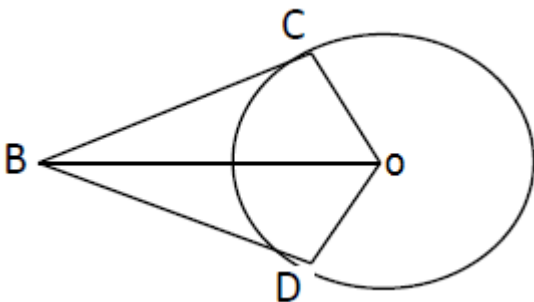
Maximum Marks: 90

Section – A

1. For what value of K sum of the roots of the equation $3x^2 - (3x - 2)x - (k-6) = 0$ is equal to the product of its roots .
2. What will be the perimeter of the triangle formed by the points $(0,0)$, $(1,0)$, $(0,1)$
3. The probability of guessing the correct answer to certain question is $P/12$, if the probability of not guessing the correct answer to the same question is $\frac{3}{4}$ then what is the value of P
4. If $p(-1,1)$ is the midpoint of the line segment joining $A(-3, 6)$ and $B(1, b+4)$, then what is the value of b

Section – B

5. If the roots of the equation $(a-b)x^2 + (b-c)x + (c-a) = 0$ are equal , Prove that $b+c = 2a$.
6. For what value of P are $(2P+1)$, 13 , $(5P-3)$ three consecutive terms of an A.P.
7. Two tangent segments BC and BD are drawn to a circle with centre O such that $\angle CBD = 120^\circ$. Prove that $OB = 2BC$.



8. A quadrilateral ABCD is drawn to circumscribe a circle , Prove that $AB + CD = AD + BC$.
9. Find the distance between the points $(5 \sin 60^\circ, 0)$ and $(0, 5 \sin 30^\circ)$.
10. If tangents AB and AC from a point A to a circle with centre O are inclined to each other at an angle of 70° , then Find $\angle AOB$.

Section – C

11. Solve for x , $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$

12. If 10 times the 10th term of an A.P is equal to 15 times the 15th term , show that its 25th term is zero.

(i) What is the relation between a and d .

(ii) Prateek declares that 25th term of the A.P is non zero , do you agree? Which value of Prateek is depicted by his declaration.

13. A 1.5 m tall boy stands at a distance of 3m from a lamp post and cast a shadow of 4.5 m on the ground. Find the height of the lamp post .

14. The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3 , Find the height of the pillar.

15. A person on tour has Rs.360 for his expenses . If he extends his tour for 4 days , he has to cut down his daily expenses by Rs.3. Find the original duration of the tour.

16. Draw a circle of radius 4.2cm. Draw a pair of tangents to this circle inclined to each other at an angle 50° .

17. The line segment joining the points $A(3,2)$, $B(5,1)$ is divided at the point P in the ratio of 1:2 and P lies on the line $3x - 18y + k = 0$, Find the value of k ?

18. Find the sum of first 25 items of an A.P whose nth term is given by $a_n = 7 - 3n$.

19. The angle of elevation of a jet fighter from a point A on the ground is 60° . After a flight of 15 seconds, the angle of elevation changes to 30° . If the jet is flying at a constant height of $1500\sqrt{3}\text{m}$ find

(i) The horizontal distance between the two positions of the jet plane .

(ii) The speed of the jet plane in km/h

(iii) Hari guesses that the speed of the jet plane is 720km/h ,how do you appreciate his guess

20. In what ratio in the line segment joining the points $A(-6,3)$ and $B(-2,-5)$ divided by the y axis

Section - C

21. A toy is the form of a cone mounted on a hemisphere of common base radius 7 cm. The total height of the toy is 31 cm ,

(i) Find the slant height of the conical part.

(ii) Write the formulas used in this solution.

(iii) Find the total surface area of the toy.

(iv) David says that the height of the conical portion is an even number, is he true? Which value is seen by his statement?

22. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel, partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel.

23. 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 $AB+CD=AD+BC$.

24. 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?

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. Three coins are tossed once. Find probability of:

(a) 3 heads (b) exactly 2 heads (c) at least 2 heads (d) at most 2 heads

28. If the roots of the equation $a(b-c)x^2 + b(c-a)x + c(a-b) = 0$ are equal, then show that $1/a, 1/b, 1/c$ are in A.P.

29. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. Using the above, do the following: If O is the centre of two concentric circles, AB is a chord of the larger circle touching the smaller circle at C, then prove that $AC=BC$

30. The angle of elevation of the top of a tower from a point A on the ground is 30° . On moving a distance of 20 metres towards the foot of the tower to a point B, the angle of elevation increases to 60° . Find the height of the tower and the distance of the tower from the point A.

31. Show that the points (0, -1), (-2, 3), (6, 7) and (8, 3) are the vertices of a rectangle