BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA
SESSION 2017-18
SAMPLE PAPER – 10

Class : X Max Marks:80
Subject : MATHEMATICS Time Allotted: 3 hrs

Instructions:
1. All questions are compulsory.
2. The question paper consists of 30 questions. Section – A comprises of 6 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 8 questions of 4 marks each.
3. Use of calculator is not permitted.

Section A

1. Check whether 6^n can end with the digit 0 for any natural number.
2. If 1 is a zero of the polynomial $p(x)= a x^2 – 3 (a - 1) x - 1$, then find the value of a.
3. Find the sum of first 20 terms of the A.P. – 6 , 0 , 6, 12,…
4. A circle touches all the four sides of a quadrilateral ABCD whose sides are AB = 6 cm ,BC = 7 cm and CD = 4 cm. Find AD.
5. Two dice are thrown simultaneously. What is the probability of getting the sum on the dice as a prime number?
6. Find the mean of the following data:

x	5	15	25	35	45
f	2	4	3	1	2

Section B

7. Find the greatest positive integer which when divided by 245 and 1029 leaves a remainder 5 in each case.
8. Find the remainder when $x^4 – 5x +6$ is divided by $2 – x^2$.
9. Find out whether the lines representing the following pair of linear equations intersect at a point, are parallel or are coincident by comparing the coefficients. :
   $2x – 3y =1; x + 2y = 2$.
10. Find the value of x for which AB = BC where A (6 , - 1) ,B (1,3) and C (x,8) .
11. Express $\sin 65^0 + \cos 85^0$ in terms of trigonometric ratios of angles between 0^0 and 45^0 .
12. Find the mode of the following distribution

Class	10 – 15	15 – 20	20 – 25	25 – 30	30 – 35
Frequency	4	7	20	8	1

Section C

13. Prove $2 – 2\sqrt{3}$ is irrational.

14. A 2 – digit number is such that the product of its digits is 18. When 27 is added to the number , then the digits interchange their places. Find the number.
15. Find p, if the numbers x , 2x + p , 3x + 6 are in A.P.
16. In triangle ABC, if AD is the median, show that $AB^2 + AC^2 = 2(AD^2 + BD^2)$.
17. If $\cos A + \sin A = \sqrt{2} \cos A$, show that $\cos A - \sin A = \sqrt{2} \sin A$.
18. The angles of elevation of the top of a tower from two points at a distance 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. Prove that the height of the tower is 6 m.
19. The radii of two concentric circles are 13 cm and 8 cm AB is the diameter of the bigger circle.BD is a tangent to the smaller circle touching it at D. Find the length AD.
20. A solid is in the form of a right circular cylinder with hemispherical ends. The total height of the solid is 19 cm and the diameter of the cylinder and the hemispheres is 7 cm. Find the volume and total surface area of the solid.
21. A game has 8 triangles of which 3 are blue and rest are red and 10 squares of which 6 are blue and rest are red. One shape is lost at random. Find the probability that it is (i) a triangle (ii) a shape of blue colour (iii) a triangle of red colour
22. Find the area of the shaded region in Fig. 7 if BC=BD=8 cm, AC=AD=15 cm and O is the centre of the circle. (Take π =3.14)

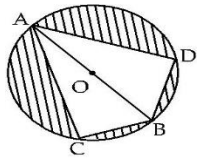
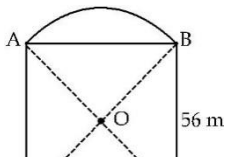


Fig. 7

SECTION - D

Question numbers 23 to 30 carry 4 marks each.

23. The product of Tanay's age (in years) five years ago and his age ten year later is 16. Determine Tanay's present age.
24. In November 2009, the number of visitors to a zoo increased daily by 20. If a total of 12300 people visited the zoo in that month, find the number of visitors on 1st Nov. 2009.
25. Find the coordinates of points of trisection of the line segment joining (4,- 1) & (- 2 ,- 3).
26. Prove that in a triangle ,if the square of one side is equal to the sum of squares of the other two sides ,then the angle opposite to the first side is a right angle.
27. Construct a triangle similar to a given triangle ABC with its sides 6/5 th of the corresponding sides of triangle ABC
28. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2 \angle OPQ$.
29. A tent is of the shape of a right circular cylinder upto a height of 3 metres and conical above it. The total height of the tent is 13.5 metres above the ground. Calculate the cost of painting the inner side of the tent at the rate of Rs. 2 per square metre, if the radius of the base is 14 metres.
30. In Figure , two circular flower beds have been shown on two sides of a square lawn ABCD of side 56 m. If the centre of each circular flower bed is the point of intersection O of the



diagonals of the square lawn, find the sum of the areas of the lawn and flower beds

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