BHARATIYA VIDYA BHAVAN'S V.M.PUBLIC SCHOOL, VADODARA
SESSION 2017-18
SAMPLE PAPER – 1

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.

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## SECTION –A

1. Given that HCF (306,657) = 9 , find LCM (306,657).
2. If one zero of the quadratic polynomial $4x^2+kx-1$ is 1, then find the value of k.
3. Is 63 a term of AP -1,4,9,14,….?
4. From a point P, 10 cm away from the centre of a circle, a tangent PT of length 8 cm is drawn. Find the radius of the circle.
5. If the median of the given data 24, 25, 26, X+2, X+3, 30, 31, 34 is 27.5, then find the value of x.
6. A card is drawn from a well shuffled deck of playing cards. Find the probability of drawing a face card.

## SECTION –B

7. Prove that $\sqrt{3}$ is an irrational number.
8. If $\propto$ and $\beta$ are the zeroes of the polynomial $p(x) = x^2-8x+k$ such that $\propto^2+\beta^2 = 40$, find the value of k.
9. For what value of k will the equations 3x+4y+2=0 and 9x+12y+k=0 represent coincident lines?
10. If A(-4,2), B(2,0), C(8,6) and D(a, b) are the vertices of a parallelogram ABCD, find a and b.
11. Evaluate: $\sin 31° \sec 59° + \left(\frac{\tan 67°}{\cot 23°}\right)^2 + \sin^2 35° - \cos^2 55°$.
12. The IQ of 50 students was recorded as follows: Find the Mode.

| IQ score | 80-90 | 90-100 | 100-110 | 110-120 | 120-130 | 130-140 |
|---|---|---|---|---|---|---|
| No. ofstudent | 5 | 10 | 16 | 15 | 3 | 1 |

## SECTION –C

13. Two tankers contain 850L and 680 L of petrol respectively. Find the maximum capacity of the container which can measure the petrol of either tanker, in exact number of times.
14. Find two consecutive odd natural numbers, the sum of whose squares is 202.
15. Find the sum of all natural numbers between 200 and 1502 which are exactly divisible by 3.
16. ABCD is a trapezium such that AB ll CD. Its diagonals AC and BD intersect each other at O. Prove that $\frac{AO}{OC} = \frac{BO}{OD}$ .

17. Prove that the parallelogram circumscribing a circle is a rhombus.
18. If tan A + sec A = a, show that $\frac{a^2-1}{a^2+1}$ = sin A
19. The angle of elevation of the top of a rock from the top and foot of a 100 m high tower are respectively 30° and 45°. Find the height of the rock.
20. A bag contains 17 black, 15 red and 13 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is (i) red (ii) black or white (iii) not black.
21. The perimeter of a sector of a circle of radius 5.6 cm is 27.2 cm. Find the area of the sector.
22. A bucket is in the form of a frustum of a cone and holds 48.51 litres of water. The radii of the top and bottom are 28 cm and 7 cm respectively. Find the height of the bucket.

## SECTION –D

23. A 2-digit number is such that the product of its digit is 14. When 45 is added to this number, the digits interchange their places. Find the number.
24. Solve for x: $9x^2 - 9$ (a +b) x + ($2a^2$ +5ab +$2b^2$).
25. Find the value of p for which the area formed by the triangle with vertices A(p,2p), B (-2,6) and C(3,1) is 10 sq units.
26. State and prove the Pythagoras theorem.
27. Construct a triangle ABC in which AB = 6.5 cm, BC = 8 cm and AC = 7 cm. Draw a triangle similar to Δ ABC with its sides equal to $\frac{7}{5}$ of the corresponding sides of Δ ABC. Write steps of construction.
28. From the top of a 50m high tower, the angle of depression of the top and bottom of a pole are observed to be 30° and 45°rrespectively. Find the height of the pole. ( $\sqrt{3}$ = 1.73)
29. Draw an Ogive for the following data and Find the Median using graph.

| Class interaval | 101-200 | 201-300 | 301-400 | 401-500 |
|---|---|---|---|---|
| Frequency | 23 | 25 | 35 | 45 |

30. A solid is composed of a cylinder with hemi-spherical ends. If the whole length of the solid is 105 cm and the radius of each of the hemi-spherical ends is 17.5 cm, find the cost of polishing its surface at the rate of Re 1 per $dm^2$.