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SAMPLE PAPER TEST 05 (BASIC) (2019-20)

SUBJECT: MATHEMATICS
CLASS : X
MAX. MARKS : 80
DURATION : 3 HRS

General Instruction:
(i) All the questions are compulsory.
(ii) The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
(iii) Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
(iv) There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
(v) Use of calculators is not permitted.

SECTION – A
Questions 1 to 20 carry 1 mark each.

1. For some integers p and 4, there exist unique integers q and r such that p = 4q + r. Possible values of r are
   (a) 0 or 1  (b) 0, 1 or 2  (c) 0, 1, 2 or 3  (d) 0, 1, 2, 3 or 4

2. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting a king of black colour.
   (a) \( \frac{1}{52} \)  (b) \( \frac{1}{26} \)  (c) \( \frac{1}{13} \)  (d) \( \frac{2}{13} \)

3. The product of the zeroes of the polynomial \( 2x^2 - 8x + 6 \) is
   (a) –3  (b) 3  (c) –4  (d) 4

4. HCF of 168 and 126 is
   (a) 21  (b) 42  (c) 14  (d) 18

5. The rational number \( \frac{129}{2^7 \cdot 7^3} \) will have a
   (a) terminating decimal expansion
   (b) non-terminating and repeating decimal expansion.
   (c) non-terminating and non-repeating decimal expansion.
   (d) none of these

6. The following figure shows the graph of \( y = f(x) \), where \( f(x) \) is a polynomial with variable \( x \). The number of zeroes of the polynomial \( f(x) \) is
   ![Graph of a polynomial function]
   (a) 2  (b) 3  (c) 4  (d) 5

7. The distance of the point \( P(-5, -12) \) from the origin is
   (a) 12  (b) 5  (c) 13  (d) none of these

Prepared by: M. S. KumarSwamy, TGT(Maths)
8. The midpoint of the line segment joining the points (7, –5) and (3, –1) is
   (a) (7, –3)  (b) (5, –3)  (c) (5, –1)  (d) (–3, 5)

9. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the
centre is 25 cm. The radius of the circle is
   (a) 7 cm  (b) 12 cm  (c) 15 cm  (d) 24.5 cm

10. Which measure of central tendency is given by the x-coordinate of the point of intersection of
   the “more than ogive” and “less than ogive”?
   (a) mean  (b) median  (c) mode  (d) all of these

11. In below figure, DE || BC, the value of AD is _____

12. The coordinates of a point A, where AB is the diameter of a circle whose centre is (2, – 3) and B
   is (1, 4) is ________.

13. If sin A = \frac{3}{4}, the value of tan A is ______

14. The value of 2 \tan^2 45° + \cos^2 30° − \sin^2 60° is ______

15. The value of k so that the system of equations has no solution: 3x – y – 5 = 0, 6x – 2y + k = 0 is
   ______.  
   The values of k for each of the quadratic equation 2x^2 + kx + 3 = 0, so that they have two equal
   roots is ______

16. A lot of 20 bulbs contain 4 defective ones. One bulb is drawn at random from the lot. What is
   the probability that this bulb is defective?

17. Find the value of 9 \sec^2 A − 9 \tan^2 A.  
   Find the value of \sin 25° \cos 65° + \cos 25° \sin 65°

18. A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the
   ladder from base of the wall.

19. A chord of a circle of radius 14 cm subtends a right angle at the centre. What is the area of the
   minor sector?

20. Check whether 301 is a term of the list of numbers 5, 11, 17, 23, . . .

SECTION – B
Questions 21 to 26 carry 2 marks each.

21. Two dice are thrown simultaneously at random. Find the probability of getting the sum of 8.
   OR
   Two coins are tossed simultaneously. Find the probability of getting 2 heads.
22. A lot consists of 144 ball pens of which 20 are defective and the others are good. Nuri will buy a pen if it is good, but will not buy if it is defective. The shopkeeper draws one pen at random and gives it to her. What is the probability that (i) She will buy it? (ii) She will not buy it?

23. Show that \( \tan 48° \tan 23° \tan 42° \tan 67° = 1 \)  

OR

If \( \tan 2A = \cot (A + 60°) \), find the value of A, where 2A is an acute angle.

24. Divide \( 3x^2 - x^3 - 3x + 5 \) by \( x - 1 - x^2 \) and find the quotient and remainder.

25. An umbrella has 8 ribs which are equally spaced. Assuming umbrella to be a flat circle of radius 45 cm, find the area between the two consecutive ribs of the umbrella.

26. 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-segment joining the points of contact at the centre.

SECTION – C
Questions 13 to 22 carry 3 marks each.

27. Prove that \( \sqrt{5} \) is an irrational number.

OR

Find the HCF and LCM of 6, 72 and 120, using the prime factorisation method.

28. In the below left figure, \( XY \) and \( X'Y' \) are two parallel tangents to a circle with centre \( O \) and another tangent \( AB \) with point of contact \( C \) intersecting \( XY \) at \( A \) and \( X'Y' \) at \( B \). Prove that \( \angle AOB = 90° \).

29. Find the area of the shaded region in above right sided figure, where \( ABCD \) is a square of side 14 cm.

30. Find the zeroes of the quadratic polynomial \( 6x^2 - 3 - 7x \) and verify the relationship between the zeroes and the coefficients.

31. If \( A, B \) and \( C \) are interior angles of a triangle \( ABC \), then show that \( \sin \left( \frac{B+C}{2} \right) = \cos \frac{A}{2} \)

OR

Express the ratios \( \cos A, \tan A \) and \( \sec A \) in terms of \( \sin A \).

32. Meena went to a bank to withdraw Rs 2000. She asked the cashier to give her Rs 50 and Rs 100 notes only. Meena got 25 notes in all. Find how many notes of Rs 50 and Rs 100 she received.

33. Draw a triangle \( ABC \) with side \( BC = 7 \text{ cm} \), \( \angle B = 45° \), \( \angle A = 105° \). Then, construct a triangle whose sides are \( \frac{4}{3} \) times the corresponding sides of \( \triangle ABC \).

OR

Draw a line segment of length 7.6 cm and divide it in the ratio 3 : 4.

Prepared by: M. S. Kumar Swamy, TGT(Maths)
34. Four friends Aditya(A), Bunny(B), Chotu(C) and Dhanush(D) are sitting in a park and they are talking to each other using walkie-talkie. Aditya told his friends that their positions will form a quadrilateral in a park. All friends also agree with Aditya. They got the coordinates of their positions as A(−5, 7), B(−4, −5), C(−1, −6) and D(4, 5). After obtaining the coordinates they have calculate the area of the quadrilateral formed. How much area they calculated?

SECTION – D

Questions 23 to 30 carry 4 marks each.

35. From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.

36. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

37. Prove that “The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.”

OR

State and prove Basic Proportionality theorem.

38. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

OR

How many terms of the AP: 9, 17, 25, . . . must be taken to give a sum of 636?

39. The radii of the ends of a frustum of a cone 45 cm high are 28 cm and 7 cm. Find its volume, the curved surface area and the total surface area.

OR

A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/h, in how much time will the tank be filled?

40. The median of the following data is 525. Find the values of x and y, if the total frequency is 100.

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