Diagnostic test for standard-10

Subject	:-	**MATHS(12)**	**Total Marks**	:- **80**
Medium	:-	**ENGLISH**	**Time**	:- **3 Hours**

Section - A

Q-1 **Choose the correct option from the options given below the statements.** **(6)**

I. In which quadrant is the point (-3, 5) represented in the coordinate plane? **1**
(A) I (B) II (C) III (D) IV

II. If x = 2, y = 3, u = -2, v = -3, then point (x + y, u + v) lies in the _____ quadrant. **1**
(A) I (B) II (C) III (D) IV

III. ∆ABC has AB = 4 and BC = 7, then _____. **1**
(A) AC <7   (B) AC**>** 4   (C) 4 <AC <7   (D) 3 <AC <11

IV. Area of parallelogram = _____ **1**
(A) Base×corresponding altitude   (B) $\frac{1}{2}$×Base×corresponding altitude
(C) Length × Breadth   (D) $\frac{1}{2}$ × Product of its diagonals

V. Area of a triangle =_____ **1**
(A) Base×corresponding altitude   (B) $\frac{1}{2}$ × Base × corresponding altitude
(C) Length × Breadth   (D) $\frac{1}{4}$×Base×corresponding altitude

VI. AB is minor arc in a circle with centre P. R is the point on the major arc except A and B. If ∠APB = 150, then ∠ARB = _____ **1**
(A) 150 (B) 75   (C) 50   (D) 100

Q-2 **Fill in the blanks so that the following statements are true.** **(6)**

VII. The measure of the complementary angle of an angle with measure40° is _____. (20° , 140°, 50°) **1**

VIII. The longest chard of a circle is its _____. (Arc, arc, diameter) **1**

IX. The Area of an equilateral triangle with side 10 cm = _____ cm^2($\frac{5\sqrt{3}}{2}, 25\sqrt{3}, 5\sqrt{3}$) **1**

X. The median of the first four even numbers is _____. (5, 10, 20) **1**

XI. A card is drawn at random from a well shuffled pack of 52 cards. Then the probability of that card being a king is _____. ($\frac{1}{52}, \frac{1}{26}, \frac{1}{13}$) **1**

XII. When two balanced dice are rolled simultaneously, the probability of getting the sum of numbers on dice as 9 is _____. ($\frac{1}{9}, \frac{1}{6}, \frac{1}{12}$) **1**

Q-3 **Write the following statements true or false.** **(4)**

XIII. The line segment joining the center of a circle and any point on the circle is the radius of the circle. **1**

XIV. The point (0, 3) lies on the Y axis. **1**

XV. At least 3 lines are needed to create a closed figure. **1**

XVI. The measure of each angle of the angle of the linear pair must be 90°. **1**

Q-4   **Answer the following questions as requested.**   **(6)**

XVII. "The cost of a note book is twice the cost of a pen." Write a linear equation in two variables to represent this statement.   1

XVIII. Find the curved surface area of a sphere with radius 7 cm.   1

XIX.   Find the mode of following observations.   17,10,13,18,22,13,26,9,13,19   1

XX.   If 5 are added to each observation of the data, what will be the difference in the Median?   1

XXI.   If P (E) = 0.37 then what is the probability of not event E?   1

XXII. Write the rationalize factor of $\frac{1}{\sqrt{7}-\sqrt{4}}$ 1

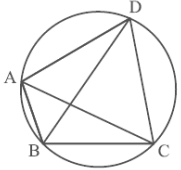**Q-5**   **Attach the appropriate pairs below.**   **(2)**

XXIII. Get the right pair of formulas.

| A	B
(A)The total surface area of a hemisphere (solid)	(1) $\frac{2}{3}\pi r^3$
(B) The volume of a hemisphere	(2) $3\pi r^2$
	(3) $2\pi r^2$

1

XXIV. Get the right pair of algebraic identities.

A	B
(A) $(x-y)^2$	(1) $(x+y)(x^2+y^2-xy)$
(B) x^2-y^2	(2) $(x+y)(x-y)$
	(3) (x^2+y^2-2xy)

1

<u>**Section – B**</u>

⦿   **Write the answers of any 9 questions in 40 to 50 words as requested.**
       (Two marks each)

Q-6   simplify: (i) $2^{\frac{2}{3}} \times 2^{\frac{1}{3}}$ (ii) $(3^{\frac{1}{5}})^4$ 2

Q-7   Find the remainder of the polynomial $x^3 + 3x^2 + 3x+1$divided by $x + 1$.   2

Q-8   Find the four solutions of the equation $2x + y = 7$.   2

Q-9   Define the following terms.   2
            (i)   Parallel lines (ii) Line segments

Q-10 ABCD is a rectangle. If AB = 5 cm and BC = 12 cm, find the diagonal BD.   2

Q-11 In the figure ABCD is a cyclic quadrilateral and AC and BD are its diagonals. If ∠ DBC = 55° and ∠BAC = 45°, find ∠BCD.   2

Q-12 If the perimeter of a triangle is 32 cm and the sides are 8 cm and 11 cm, find its area.   2

Q-13 If the height of circular cylinder is 14 cm and the area of the curved surface is 88 cm², find the diameter of the base of the cylinder.   2

**Q-14** A coin is tossed 1000 times with the following frequencies Head: 455, Tail: 545 compute the probability for each event.   2

Q-15 If $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$, find the value of k.   2

Q-16 Check if $7 + 3x$ is a factor of $3x^3 + 7x$.   2

Q-17 The sides of the $\triangle$ PQR in the figure extend QP and RQ to the points S and T, respectively. If $\angle SPR = 135^\circ$ and $\angle PQT = 110^\circ$, get $\angle PRQ$.   2
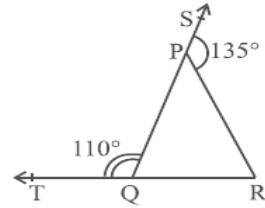
Section - C

⦿ **Write the answer of any 6 questions in 60 to 80 words as requested.**
(3 marks each)

Q-18 The ratio of the angles of a quadrilateral is 3: 5: 9: 13, find all the angles of this quadrilateral.   3

Q-19 The points A, B, and C on the circle with center O in the figure are such that $\angle BOC = 30^\circ$ and $\angle AOB = 60^\circ$. If D is a point on the circle other than the arc ABC, find $\angle ADC$.   3
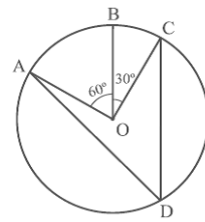
Q-20 The length, breadth, and height of a rectangular box are 80 cm, 40 cm, and 20 cm, respectively. If a square paper of 40 cm length is to be glued on it, how many such papers will be required?   3

Q-21 If the cone-shaped tent is 10 m high and its base radius is 24 m, then (i) Find the slant height of the tent. (ii) Cost of the canvas required to make the tent, if the cost of $1m^2$ canvas is ₹ 70.   3

Q-22 The marks obtained by the student in a test of 20 marks in Mathematics are as follows. Find the median of the information.   3

| Marks	4	6	10	15	18	20
Number of students	2	4	8	12	3	1

Q-23 1500 families with two children were randomly selected and the following information was received.   3

Number of girls in the family	2	1	0
Number of families	475	814	211

In a randomly selected family

   (i)   If there are 2 girls, (ii) no girl, calculate the probability.

Q-24 If the sides of a triangle are 12:17:25 and its perimeter is 540 cm, find its area.   3

Q-25 The lines AB and CD intersect at O in the given figure. If $\angle AOC + \angle BOE = 70^\circ$ and $\angle BOD = 40^\circ$ then get $\angle BOE$ and reflex$\angle COE$.   3
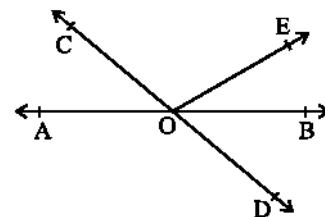
Q-26 50 seeds were selected from each of the 5 bags of seeds and placed in suitable conditions for germination. The germinated seeds from each after 20 days were counted as follows.

Bag	1	2	3	4	5
Number of germinated seeds	40	48	42	39	41

3

Find the probability of seed germination from the following.

    (i) More than 40 seeds in a bag.

    (ii) 49 seeds in a bag.

    (iii) More than 35 seeds in the bag.

Section - D

◉ **Write the answer of any 5 questions in 90 to 120 words. (4 marks each)**

Q-27 Construct an angle of 45° at the point of origin of a given ray and write the step of construction.

4

Q-28 Construct a perpendicular bisector of a line segment of 6 cm and write the step of construction.

4

Q-29 Prove that: The opposite angles of two equal sides of an isosceles triangle are the same.

4

Q-30 Prove that: Any diagonal of a parallelogram quadrilateral divides it into two congruent triangles.

4

Q-31 Monica has a piece of canvas with an area of 551 m^2. He uses the piece to make a cone-shaped tent with a radius of 7m base. Finding the volume of the tent if 1m^2 is wasted in taking and cutting stitches. (There is no canvas in the base of the tent)

4

Q-32 One box has an area of 9.375 m^2 of color that can be painted. How many bricks measuring 22.5 cm × 10 cm × 7.5 cm can be painted with the color of this box.

4

Q-33 The following observations are arranged in ascending order. If the median of data center is 63, find the value of x. Find the median of this information.
29,32,48, 50, x, x+2,72,78,84,95

4

Q-34 A study was conducted to find the concentration of Sulfur dioxide (SO_2) in a city atmosphere in ppm. The information received in 30 days is as follows.

0.03, 0.08, 0.08, 0.09, 0.04, 0.17, 0.16, 0.05, 0.02, 0.06, 0.18, 0.20, 0.11, 0.08, 0.12, 0.13, 0.22, 0.07, 0.08, 0.01, 0.10, 0.06, 0.09, 0.18, 0.11, 0.07, 0.05, 0.07, 0.01, 0.04

Based on this information,

(i) Make a grouped frequency distribution table for this class intervals as 0.00-0.04, 0.04-0.08… and so on.

(ii) For how many days will the concentration of SO_2 be more than 0.11 ppm?

4

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