Salem District   LS

2RSM   **SECOND REVISION TEST - 2020**

X - Std   **MATHEMATCIS**

Time : 3.00 Hrs   Marks: 100

PART -I

Answer all the questions. (Choose the correct answer from the given four alternatives and write with the option code). $14 \times 1 = 14$

1. If $f : A \to B$ is such that $f(A) = B$ then f is
   - a) one - one function
   - b) Identity function
   - c) on - to function
   - d) Bijective function

2. If $f : A \to B$ is a bijective function and if $n(B) = 7$, then $n(A)$ is equal to
   - a) 7
   - b) 49
   - c) 1
   - d) 14

3. The values of n such that $29 \equiv 5 \pmod{n}$ are
   - a) 1, 2, 3, 4, 6, 8, 12, 24
   - b) 2, 4, 6, 8, 12, 24
   - c) 1, 2, 3, 4
   - d) 6, 8, 12, 24

4. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \text{------}$ is
   - a) $\frac{1}{24}$
   - b) $\frac{1}{27}$
   - c) $\frac{2}{3}$
   - d) $\frac{1}{81}$

5. Which of the following should be added to make $x^4 + 64$ a perfect square
   - a) $4x^2$
   - b) $16x^2$
   - c) $8x^2$
   - d) $-8x^2$

6. The sum of the roots of the quadratic equation $3\left(x + \frac{2}{3}\right)^2 = 0$ is
   - a) $-\frac{4}{3}$
   - b) -4
   - c) $\frac{4}{3}$
   - d) $\frac{3}{4}$

7. If A is a 2×3 matrix and B is a 3×4 matrix
   - a) 3
   - b) 4
   - c) 2
   - d) 5

8. A tangent is perpendicular to the radius at the
   - a) centre
   - b) point of contact
   - c) infinity
   - d) chord

9. The slope of the line joining (12, 3), (4, a) is $\frac{1}{8}$. The value of 'a' is
   - a) 1
   - b) 4
   - c) -5
   - d) 2

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10. If A is a point on the Y axis whose ordinate is 8 and B is a point on the X axis whose abscissa is 5 then the equation of the line AB is

   a) 8x + 5y = 40   b) 8x − 5y = 40   c) x = 8   d) y = 5

11. From the top of a tower the angles of depression of two points A and B on the ground are observed to be 45° and x° respectively, then the angle of elevation of the top of the tower from the point B

   a) 45°   b) 30°   c) 75°   d) 15°

12. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

   a) $4\pi r^2$ sq units   b) $6\pi r^2$ sq units
   c) $3\pi r^2$ sq unit   d) $8\pi r^2$ sq unit

13. The range of the data 8, 8, 8, 8, 8 _____ 8 is

   a) 0   b) 1   c) 8   d) 3

14. The probability a red marble selected at random from a jar containing p red, q blue and r green marbes is

   a) $\dfrac{q}{p+q+r}$ b) $\dfrac{p}{p+q+r}$ c) $\dfrac{p+q}{p+q+r}$ d) $\dfrac{p+r}{p+q+r}$

PART - II

Answer 10 questions. (Question no. 28 is compulsory).   10 X 2 = 20

15. Define : Vertical line test.

16. Find the terms a_6 and a_{13} of the sequence $a_n = \dfrac{5n}{n+2}$.

17. If $1 + 2 + 3 + $ _____ $+ n = 666$, then find the value of n.

18. Find the square root of $4x^2 + 20x + 25$

19. If α and β are the roots of the equation $2x^2 − 7x + 5 = 0$, then find the value $\dfrac{1}{\alpha} + \dfrac{1}{\beta}$.

20. Find the values of x, y and z from the equation $\begin{pmatrix} x+y+z \\ x+z \\ y+z \end{pmatrix} = \begin{pmatrix} 9 \\ 5 \\ 7 \end{pmatrix}$.

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21. In two concentric circles the radius of the outer circle is 5cm. If a chord of length 8cm of the outer circle is a tangent to the inner circle then find the radius of the inner circle.

22. A tower stands vertically on the ground. From a point on the ground, which is 48m away from the foot of the tower, the angle of elevation of the top of the tower is 30^0. Find the height of the tower.

23. Prove that $\sqrt{\dfrac{1+\sin\theta}{1-\sin\theta}} = \sec\theta + \tan\theta$.

24. The curved surface area of a right circular. Cylinder of height 14cm is 88cm^2. Find the diameter of the cylinder.

25. . If the circumference of a conical wooden piece is 484 cm then find its volume when its height is 105cm.

26. If the standard deviation of a data is 3.6 and each value of the data is divided by 3, then find the new variance and new standard deviation.

27. What is the probability that a leap year selected at random will contain 53 Saturdays.

28. Find the equation of the straight line with slope-3 and x intercept -5.

PART - III

Answer 10 questions. (Question No. 42 is compulsory).   10 X 5 = 50

29. The Cartesian product A X B consist of 12 elements, if few of which are (1, 3), (-1, 0), (0, 1), (1, 2) then find the sets A and B. Also find A X B, B X A.

30. If $f(x) = x^2$, $g(x) = 2x$ and $h(x) = x + 4$, then show that $(fog)oh = fo(goh)$.

31. Find the greatest number consisting of 6 digits. Which is exactly divisible by 24, 15, 36?

32. In an A.P., sum of four consecutive terms is 28 and their sum of their square is 276. Find the four numbers.

33. Find the GCD of the polynomials $x^3 + x^3 - x + 2$ and $2x^3 - 5x^2 + 5x - 3$.

34. Find the square root of $37x^2 - 28x^3 + 4x^4 + 42x + 9$.

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35. If $A = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$, then prove that $A^2 - 2KA = 0$.

36. If the points A (-3, 9), B (a, b) and C (4, -5) are collinear and if a + b = 1, then find a and b.

37. A line makes positive intercepts on coordinate axes whose sum is 7 and it passes through (-3, 8) Find its equation.

38. Two ships are sailing in the sea on either sides of a lighthouse. The angle of elevation of the top of the lighthouse as observed from the ships are 30° and 45° respectively. If the lighthouse is 200m high, find the distance between the two ships. ($\sqrt{3}$ = 1.732)

39. A solid right circular cone of diameter 14cm and height 8cm is melted to form a hollow sphere. If the external diameter of the sphere is 10cm, find the internal diameter.

40. For a group of 100 candidates the mean and standard deviation of their marks were found to be 60 and 15 respectively. Later on it was found that the scores 45 and 72 were wrongly entered as 40 and 27. Find the correct mean and standard deviation.

41. Two dice are rolled together. Find the probability of getting a doublet or sum of faces as 4

42. AB is a chord of length 6cm to a circle of radius 5cm. The tangents at A and B intersect at a point P. Find the length of the tangent PA.

PART - IV

Answer all the questions.   2 X 8 = 16

43. a) Construct a triangle similar to a given triangle PAR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR. (OR)

b) Draw a tangent to the circle from the point P having radius 3.6cm, and centre at O. Point P is at a distance 7.2 cm from the centre.

44. a) Draw the graph of $y = x^2 + x - 2$ and hence solve $x^2 + x - 2 = 0$. (OR)

b) Draw the graph of $y = (x - 1)(x + 3)$ and hence solve $x^2 - x - 6 = 0$.

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