Ramnad District **First Revision Examination – 2020** LS

**Ramanathapuram District**

**Time: 3.00 Hrs.** **X Standard – Mathematics** **Maximum Marks : 100**

**PART– I (Marks - 14)**

**Note:** i) **Answer All the 14 questions**

ii) **Choose the most suitable answer from given the four alternatives and write the option code with the corresponding answers.** **14 x 1 = 14**

1. If the order pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal then, $(a, b)$ is

   a) $(2, -2)$ b) $(5, 1)$ c) $(2, 3)$ d) $(3, -2)$

2. The function $f : N \to N$ defined by $f(x) = 2x$ then, $f$ is

   a) one-one and not onto b) Not one-one and not onto

   c) onto but not one-one d) one-one and onto

3. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \ldots$

   a) $\frac{1}{24}$ b) $\frac{1}{27}$ c) $\frac{2}{3}$ d) $\frac{1}{81}$

4. A boy saves ₹ 1 on the first day, ₹ 2 on the second day, ₹ 4 on the third day and so on. How much did the boy will save up to 20 days?

   a) $2^{19}+1$ b) $2^{19}-1$ c) $2^{20}+1$ d) $2^{20}-1$

5. $y^2+\frac{1}{y^2}$ is not equal to

   a) $\frac{y^4+1}{y^2}$ b) $\left(y+\frac{1}{y}\right)^2$ c) $\left(y-\frac{1}{y}\right)^2+2$ d) $\left(y+\frac{1}{y}\right)^2-2$

6. If $P$ and $Q$ are matrices then which of the following is true?

   a) $P+Q \neq Q+P$ b) $\left(P^T\right)^T \neq P$ c) $PQ \neq QP$ d) All are true

7. Which constant must be added and subtracted to solve the quadratic equation $9x^2-\frac{3}{4}x-\sqrt{2}=0$ by the method of completing the square?

   a) $\frac{1}{8}$ b) $\frac{1}{4}$ c) $\frac{1}{64}$ d) $\frac{9}{64}$

8. In a $\Delta ABC$, $AD$ is the bisector of $\angle BAC$. If $AB = 8$ cm, $BD = 6$ cm and $DC = 3$ cm then the length of the side $AC$ is

   a) 6 cm b) 4 cm c) 3 cm d) 8 cm

9. $A(0, 5)$, $B(5, 0)$ and $C(-4, -7)$ are vertices of the triangle then its centroid is

   a) $(1, -2)$ b) $\left(\frac{1}{3}, \frac{-2}{3}\right)$ c) $\left(\frac{1}{2}, -1\right)$ d) $(0, 0)$

10. If the ratio of the height of a tower and length of its shadow is $\sqrt{3}:1$, then the angle of elevation of the sun has measure

a) $45^0$ b) $30^0$ c) $90^0$ d) $60^0$

11. The total surface area of a cylinder whose radius is $\frac{1}{3}$ of its height is

a) $\frac{9\pi h^2}{8}$ Sq. units b) $24\pi h^2$ Sq. units c) $\frac{8\pi h^2}{9}$ Sq. units d) $\frac{56\pi h^2}{9}$ Sq. units

12. A hemisphere and a cone have equal bases. If their heights are also equal, then the ratio of their curved surface area will be

a) $1:2$ b) $2:1$ c) $1:\sqrt{2}$ d) $\sqrt{2}:1$

13. The standard deviation of a data is 3. If each value is multiplied by 5 then the new variance is

a) 3 b) 15 c) 5 d) 225

14. Two dice are tossed. The probability that the total score is a prime number is

a) $\frac{1}{6}$ b) $\frac{5}{12}$ c) $\frac{1}{2}$ d) $\frac{7}{9}$

## PART – II (Marks - 20)

**Note: Answer TEN questions. Question Number. 28 is compulsory.** **10 x 2 = 20**

15. A relation $f$ is defined by $f(x)=x^2-2$, where $x\in\{-2,-1,0,3\}$

(i). List the elements of $f$

(ii). Is $f$ a function?

16. Define Identity function. Give an example.

17. If $d$ is highest common factor (HCF) of 32 and 60. Find $x$ and $y$ satisfying $d=32x+60y$

18. If $1+2+3+.....+n=666$ then find $n$

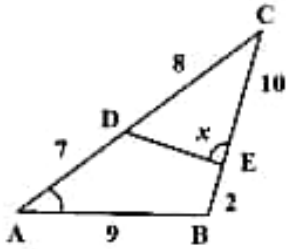
19. Find the sum and product of the roots of the quadratic equation $x^2+3x=0$

20. If $A=\begin{pmatrix}4 & -2\\ 5 & 9\end{pmatrix}$ and $B=\begin{pmatrix}8 & 2\\ -1 & -3\end{pmatrix}$ then, find $6A-3B$

21. Is 0.2 a root of the equation $x^2-0.4=0$ ? Justify.

22. Find the equation of a straight line which is parallel to the line $3x-7y=12$ and passing through the point $(6, 4)$

23. In figure $\angle A=\angle CED$. Prove that $\Delta CAB \sim \Delta CED$. Also find the value of $x$



24. Prove:- $\frac{\sin A}{1+\cos A} = \operatorname{cosec} A - \cot A$

25. From the top of a building 12 m high, the angle of depression of a car on the ground is observed to be $30^0$. Find the distance of the car from the building.

26. If the volume of a sphere is $36\pi\ cm^3$. Find the volume of a cone with same radius and height of a sphere.

27. Express the sample space for rolling two dice using tree diagram.

28. Today is Tuesday. My uncle will come after 45 days. In which day my uncle will be coming?

## PART – III (Marks - 50)

**Note: Answer TEN questions. Question Number. 42 is compulsory.** **10 x 5 = 50**

29. Let $A=\{1, 2, 3, 4\}$ and $B=\{2, 5, 8, 11, 14\}$ be two sets. Let $f: A \to B$ be a function given by $f(x)=3x-1$. Represent the function
(i) as a set of ordered pairs (ii) by arrow diagram
(iii) in a table form (iv) in a graphical form.

30. If $f(x)=x^2$, $g(x)=3x$ and $h(x)=x-2$. Prove that $(f \circ g) \circ h = f \circ (g \circ h)$

31. The sum of the first $n$, $2n$ and $3n$ terms of an A.P. are $S_1$, $S_2$ and $S_3$ respectively. Prove that $S_3=3(S_2-S_1)$

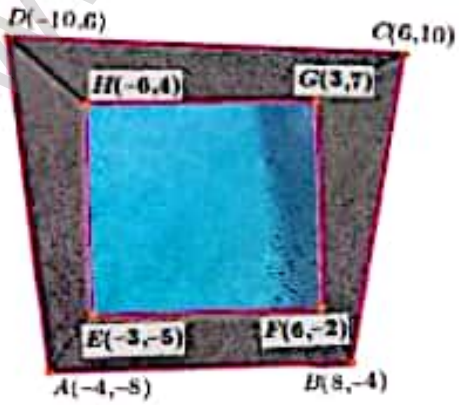
32. Find the sum of the series $(2^3-1^3)+(4^3-3^3)+(6^3-5^3)+\ldots$ to (i). $n$ terms (ii). 8 terms

33. Vani, her father and her grandfather have an average age of 53. One-half of her grandfather's age plus one-third of her father's age plus one fourth of Vani's age is 65. Four years ago if Vani's grandfather was four times as old as Vani then how old are they all now?

34. If $A=\begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ then, Prove that $A^2-5A+7I_2=0$

35. State and Prove Phythagoras theorem.

36. In the figure, quadrilateral swimming pool shown is surrounded by concrete patio. Find the area of patio.



37. The top of a 15 m high tower makes an angle of elevation of $60^0$ with the bottom of an electric pole and angle of elevation $30^0$ with the top of the pole. What is the height of the electric pole?

38. From a solid cylinder whose height is 2.4 cm and the diameter 1.4 cm, a cone of the same height and same diameter is carved out. Find the volume of the remaining solid to the nearest $cm^3$

39. The outer and the inner surface areas of spherical copper shell are $576\pi\ cm^2$ and $324\pi\ cm^2$ respectively. Find the volume of the material required to make the shell.

40. Find the coefficient of variation of 38, 40, 47, 44, 46, 43, 49, 53

41. Two dice are thrown simultaneously. What is the probability that the sum of numbers appearing on the dices is

(i). 7 (ii). greater than 5 (iii). 1

42. Find the square root of $\frac{4x^2}{y^2}+\frac{20x}{y}+13-\frac{30y}{x}+\frac{9y^2}{x^2}$

## PART - IV (Marks- 16)

**Note: Answer both questions.** **2 x 8 = 16**

43. (a). Construct a triangle similar to a given triangle $PQR$ with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle $PQR$ .(Scale factor $\frac{7}{3}>1$)

**OR**

(b). Draw a circle of diameter 6 cm from a point $P$, which is 8 cm away from its centre. Draw the two tangents $PA$ and $PB$ to the circle and measure their lengths.

44. (a). Draw the graph of $y=x^2-4x+3$ and use it to solve $x^2-6x+9=0$.

**OR**

(b). An express train takes one hour less than a passenger train to travel 132 km. between Chennai to Tindivanam. If the average speed of the express train is 11 km/h more than that of the passenger train. Find the average speed of two trains.