

Salem (dt)

SRS

## SECOND REVISION EXAMINATION - 2024

10 - Std

## MATHEMATICS

Time : 3.00 Hrs

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Marks : 100

CHOOSE THE CORRECT ANSWER:

14 X 1 = 14

- If  $A = \{1, 2\}$ ,  $B = \{1, 2, 3, 4\}$ ,  $C = \{5, 6\}$  and  $D = \{5, 6, 7, 8\}$  then state which of the following statement is true  
 (a)  $(A \times C) \subset (B \times D)$  (b)  $(B \times D) \subset (A \times C)$  (c)  $(A \times B) \subset (A \times D)$  (d)  $(D \times A) \subset (B \times A)$
- Let  $f(x) = \frac{1}{x+1}$ . If  $x = -1$  then the value of  $f(-1)$  is  
 (a) 0 (b) 1 (c) -1 (d) not defined
- If  $p^{\text{th}}$ ,  $q^{\text{th}}$  and  $r^{\text{th}}$  terms of an A.P are  $a$ ,  $b$ ,  $c$  respectively then  $a(q - r) + b(r - p) + c(p - q)$  is  
 (a) 0 (b)  $a + b + c$  (c)  $pq$  (d)  $p + q + r$
- If the HCF of 65 and 117 is expressible in the form of  $65m - 117$ , then the value of  $m$  is  
 (a) 4 (b) 2 (c) 1 (d) 3
- The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P  
 (a) 4551 (b) 10091 (c) 7881 (d) 13531
- The square root of  $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$  is equal to  
 (a)  $\frac{16}{5} \left| \frac{x^2z^4}{y^2} \right|$  (b)  $16 \left| \frac{y^2}{x^2z^4} \right|$  (c)  $\frac{16}{5} \left| \frac{y}{xz^2} \right|$  (d)  $\frac{16}{5} \left| \frac{xz^2}{y} \right|$
- The solution of  $(2x-1)^2 = 9$  is equal to  
 (a) -1 (b) 2 (c) -1, 2 (d) none of these
- If  $\alpha$  and  $\alpha^2$  are the roots of the equation  $x^2 - bx + 8 = 0$  then the value of  $b$  is  
 (a) 2 (b) 4 (c) 6 (d) 8
- Two poles of heights 6m and 11m stand vertically on a plane ground. If the distance between their feet is 12m, what is the distance between their tops?  
 (a) 13m (b) 14m (c) 15m (d) 12.8m
- The slope of the line which is perpendicular to a line joining the points (0,0) and (-8, 8) is  
 (a) -1 (b) 1 (c)  $\frac{1}{5}$  (d) -8

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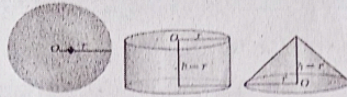
11. (2,1) is the point of intersection of two lines  
 (a)  $x - y - 3 = 0$ ;  $3x - y - 7 = 0$  (b)  $x + y = 3$ ;  $3x + y = 7$   
 (c)  $3x + y = 3$ ;  $x + y = 7$  (d)  $x + 3y - 3 = 0$ ;  $x - y - 7 = 0$
12. The angle of elevation of a cloud from a point h metres above a lake is  $\beta$ . The angle of depression of its reflection in the lake is  $45^\circ$ . The height of location of the cloud from the lake is  
 (a)  $\frac{(a)h(1+\tan\beta)}{(1-\tan\beta)}$  (b)  $\frac{h(1-\tan\beta)}{(1+\tan\beta)}$  (c)  $h \tan(45^\circ - \beta)$  (d) None of these
13. The height of a right circular cone whose radius is 5cm and slant height is 13cm will be  
 (a) 12cm (b) 10cm (c) 13cm (d) 5cm
14. The probability that a student will score centum in mathematics is  $\frac{4}{5}$ . The probability that he will not score centum is  
 (a)  $\frac{1}{5}$  (b)  $\frac{2}{5}$  (c)  $\frac{3}{5}$  (d) 1

## PART - II

Answer Any 10 Questions. Question No.28 Is Compulsory:  $10 \times 2 = 20$

15. Find AXB and BXA where  $A=B=\{p,q\}$
16. If  $f(x) = x^2 - 1$ ,  $g(x) = x - 2$  find a, if  $g \circ f(a) = 1$ .
17. Find the indicated terms of the sequences whose  $n^{\text{th}}$  terms is given by  $a_n = -(n^2 - 4)$ ;  $a_4$  and  $a_{11}$
18. In a G.P. 729, 243, 81, ... find  $t_7$
19. Reduce the following rational expressions to its lowest form.  $\frac{9x^2 + 81x}{x^3 + 8x^2 - 9x}$
20. Find the value of the 'k' for which the roots of the following equation is real and equal.  $Kx^2 + (6k + 2)x + 16 = 0$ .
21. The length of the tangent to a circle from a point P, which is 25 cm away from the centre is 24cm. What is the radius of the circle? 9.00
22. Find the equation of a straight line whose inclination is  $45^\circ$  and y intercept is 11.
23. Prove the following identity:  $\tan^4\theta + \tan^2\theta = \sec^4\theta - \sec^2\theta$
24. A kite is flying at a height of 75m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is  $60^\circ$ . Find the length of the string, assuming that there is no slack in the string.
25. If the ratio of radii of two spheres is 4:7, find the ratio of their volumes.

26. A sphere, a cylinder and a cone (from figure) are of the same radius, where as cone and cylinder are of same height. Find the ratio of their curved surface areas.



27. If the mean and coefficient of variation of a data are 15 and 48 respectively, then find the value of standard deviation.
28. Find the mean of first 100 odd natural numbers.

### PART III

**Answer Any 10 Questions. Question No.42 Is Compulsory: 10X5=50**

29. Let A = The set of all natural numbers less than 8, B = The set of all prime numbers less than 8, C = The set of even prime number. Verify that  $A \times (B - C) = (A \times B) - (A \times C)$
30. Let  $A = \{1, 2, 3, 4\}$  and  $B = \{2, 5, 8, 11, 14\}$  be two sets. Let  $f : A \rightarrow B$  be a function given by  $f(x) = 3x - 1$ . Represent this function (i) by arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) in a graphical form.
31. Find the sum of all natural numbers between 300 and 600 which are divisible by 7.
32. Find the sum of the following series:  $10^3 + 11^3 + 12^3 + \dots + 20^3$
33. Discuss the nature of solutions of the following system of equation
- $$\frac{y+z}{4} = \frac{z+x}{3} = \frac{x+y}{2}; \quad x+y+z=27$$
34. If  $A = \begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$  show that  $A^2 - 5A + 7I_2 = 0$ .
35. State and prove Basic Proportionality Theorem (BPT).
36. Find the equation of a straight line passing through  $(-8, 4)$  and making equal intercepts on the coordinate axes.
37. Find the equation of a straight line through the point of intersection of the lines  $8x+3y=18$ ,  $4x+5y=9$  and bisecting the line segment joining the points  $(5, -4)$  and  $(-7, 6)$ .
38. The top of a 15m high tower makes an angle of elevation of  $60^\circ$  with the bottom of an electronic pole and angle of elevation of  $30^\circ$  with the top of the pole. What is the height of the electric pole?
39. Arul has to make arrangements for the accommodation of 150 persons for his family function. For this purpose, he plans to build a tent which is in the shape of cylinder surmounted by a cone. Each person occupies 4 sq.m of the space on

ground and 40 cu.meter of air to breathe. What should be the height of the conical part of the tent if the height of cylindrical part is 8m?

40. Seenu's house has an overhead tank in the shape of a cylinder. This is filled by pumping water from a sump (underground tank) which is the shape of a cuboid. The sump has dimensions  $2m \times 1.5m \times 1m$ . The overhead tank has its radius of 60cm and height 105cm. Find the volume of the water left in the sump after the overhead tank has been completely filled with water from the sump which has been full, initially.
41. Two dice are rolled once. Find the probability of getting an even number on the first die or a total of face sum 8.
42. The following table gives the details of District level winners of Kalaithiruvizha held in 5 districts.

District	Chennai	Vizhupuram	Madurai	Kancheepuram	Vellore
Number of district level winners	113	117	110	125	145

Find the co-efficient of variation for the above detail.

#### PART IV

#### ANSWER ALL THE QUESTIONS:

2 X 8 = 16

- 43 a) Draw the two tangents from a point which is 5 cm away from the centre of a circle of diameter 6 cm. Also, measure the lengths of the tangents.

(OR)

- b) Draw  $\Delta PQR$  such that  $PQ = 6.8$  cm, vertical angle is  $50^\circ$  and the bisector of the vertical angle meets the base at D where  $PD = 5.2$  cm.
- 44 a) Nishanth is the winner in a marathon race of 12km distance. He ran at the uniform speed of 12 km/hr and reached the destination in 1 hour. He was followed by Aradhana, Ponmozhi, Jeyanth, Sathya and Swetha with their respective speed of 6 km/hr, 4 km/hr, 3 km/hr, 2 km/hr. And, they covered the distance in 2hrs, 3 hrs, 4 hrs and 6 hrs respectively. Draw the speed-time graph and use it to find the time taken to Kaushik with his speed of 2.4 km/hr.

(OR)

- b) Graph the quadratic equation  $(2x-3)(x+2) = 0$  and state its nature of solution.