

# RELIANCE MATRIC HR SEC SCHOOL

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## REVISION TEST - 1

MATHEMATICS

Total Marks: 100 Marks

Class: 10

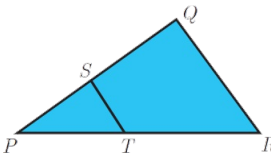
Duration: 3 Hrs

### SECTION A

#### I 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.
  - $(A \times C) \subset (B \times D)$
  - $(B \times D) \subset (A \times C)$
  - $(A \times B) \subset (A \times D)$
  - $(D \times A) \subset (B \times A)$
- If  $f: A \rightarrow B$  is a bijective function and if  $n(B) = 7$ , then  $n(A)$  is equal to
  - 7
  - 49
  - 1
  - 14
- The value of  $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$  is
  - 14400
  - 14200
  - 14280
  - 14520
- 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.
  - 4551
  - 10091
  - 7881
  - 13531
- If  $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix}$ ,  $B = \begin{pmatrix} 1 & 0 \\ 2 & -1 \\ 0 & 2 \end{pmatrix}$  and  $C = \begin{pmatrix} 0 & 1 \\ -2 & 5 \end{pmatrix}$ . Which of the following statements correct?
  - $AB + C = \begin{pmatrix} 5 & 5 \\ 5 & 5 \end{pmatrix}$
  - $BC = \begin{pmatrix} 0 & 1 \\ 2 & -3 \\ -4 & 10 \end{pmatrix}$
  - $BA + C = \begin{pmatrix} 2 & 5 \\ 3 & 0 \end{pmatrix}$
  - $(AB)C = \begin{pmatrix} -8 \\ -8 \end{pmatrix}$
  - (i) and (ii) only
  - (ii) and (iii) only
  - (iii) and (iv) only
  - all of these
- Transpose of a column matrix is
  - unit matrix
  - diagonal matrix
  - column matrix
  - row matrix
- In  $\triangle LMN$ ,  $\angle L = 60^\circ$ ,  $\angle M = 50^\circ$ . If  $\triangle LMN \sim \triangle PQR$  then the value of  $\angle R$  is
  - $40^\circ$
  - $70^\circ$
  - $30^\circ$
  - $110^\circ$
- In a given figure  $ST \parallel QR$ ,  $PS = 2$  cm and  $SQ = 3$  cm. Then the ratio of the area of  $\triangle PQR$  to the area of  $\triangle PST$  is
 



  - 25 : 4
  - 25 : 7
  - 25 : 11
  - 25 : 13
- When proving that a quadrilateral is a trapezium, it is necessary to show
  - Two sides are parallel
  - Two parallel and two non-parallel sides
  - Opposite sides are parallel
  - All sides are of equal length
- Consider four straight lines
  - $l_1 : 3y = 4x + 5$
  - $l_2 : 4y = 3x - 1$
  - $l_3 : 4y + 3x = 7$
  - $l_4 : 4x + 3y = 2$
 Which of the following statement is true ?
  - $l_1$  and  $l_2$  are perpendicular
  - $l_1$  and  $l_4$  are parallel
  - $l_2$  and  $l_4$  are perpendicular
  - $l_2$  and  $l_3$  are parallel
- If  $5x = \sec \theta$  and  $\frac{5}{x} = \tan \theta$ , then  $x^2 - \frac{1}{x^2}$  is equal to
  - 25
  - $\frac{1}{25}$
  - 5
  - 1
- A tower is 60 m height. Its shadow is x metres shorter when the sun's altitude is  $45^\circ$  than when it has been  $30^\circ$ , then x is equal to
  - 41.92 m
  - 43.92 m
  - 43 m
  - 45.6 m
- A frustum of a right circular cone is of height 16cm with radii of its ends as 8cm and 20cm. Then, the volume of the frustum is
  - $3328\pi \text{ cm}^3$
  - $3228\pi \text{ cm}^3$
  - $3240\pi \text{ cm}^3$
  - $3340\pi \text{ cm}^3$

14. Which of the following is incorrect?

- a)  $P(A) > 1$   
c)  $P(\phi) = 0$

- b)  $0 \leq P(A) \leq 1$   
d)  $P(A) + P(\bar{A}) = 1$

### SECTION B

**II ANSWER ANY 10 QUESTIONS (Q.NO:28 IS COMPULSORY)**

10 X 2 = 20

15. Given the function  $f : x \rightarrow x^2 - 5x + 6$ , evaluate  $f(-1)$
16. If  $A \times B = \{(3,2), (3,4), (5,2), (5,4)\}$  then find A and B.
17. Find the least positive value of x such that  $67 + x \equiv 1 \pmod{4}$
18. Find the sum of first six terms of the G.P. 5, 15, 45, .....
19. Find the LCM of  $p^2 - 3p + 2$ ,  $p^2 - 4$
20. Simplify  $\frac{p^2 - 10p + 21}{p-7} \times \frac{p^2 + p - 12}{(p-3)^2}$
21. Find the value of a, b, c, d from the equation  $\begin{pmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{pmatrix} = \begin{pmatrix} 1 & 5 \\ 0 & 2 \end{pmatrix}$
22. A tangent ST to a circle touches it at B. AB is a chord such that  $\angle ABT = 65^\circ$ . Find  $\angle AOB$ , where "O" is the centre of the circle.
23. Find the slope of a line joining the given points  $\left(-\frac{1}{3}, \frac{1}{2}\right)$  and  $\left(\frac{2}{7}, \frac{3}{7}\right)$
24. Check whether the given lines are parallel or perpendicular  
 $5x + 23y + 14 = 0$  and  $23x - 5y + 9 = 0$
25. A kite is flying at a height of 75 m 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.
26. A solid sphere and a solid hemisphere have equal total surface area. Prove that the ratio of their volume is  $3\sqrt{3} : 4$ .
27. If  $n = 5$ ,  $\bar{x} = 6$ ,  $\sum x^2 = 765$ , then calculate the coefficient of variation.
28. The volumes of two cones of same base radius are  $3600 \text{ cm}^3$  and  $5040 \text{ cm}^3$ . Find the ratio of heights.

### SECTION C

**III ANSWER ANY 10 QUESTIONS (Q.NO 42 IS COMPULSORY)**

10 X 5 = 50

29. Let  $A = \{x \in \mathbb{W} | x < 2\}$ ,  $B = \{x \in \mathbb{N} | 1 \leq x < 4\}$  and  $C = \{3, 5\}$ . Then verify that  $A \times (B \cap C) = (A \times B) \cap (A \times C)$
30. Let  $A = \{0, 1, 2, 3\}$  and  $B = \{11, 3, 5, 7, 9\}$  be two sets. Let  $f: A \rightarrow B$  be a function given by  $f(x) = 2x + 1$ . Represent this function as  
(i) a set of ordered pairs (ii) a table (iii) an arrow and (iv) a graph.
31. Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm, ..., 24 cm. How much area can be decorated with these colour papers?
32. The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.
33. If  $4x^4 - 12x^3 + 37x^2 + bx + a$  is a perfect square. Find the values of a and b.
34. If  $\alpha$  and  $\beta$  are the roots of  $2x^2 - x - 1 = 0$ , then form the equation whose roots are  $\frac{1}{\alpha}, \frac{1}{\beta}$
35. Check whether AD is bisector of  $\angle A$  of  $\triangle ABC$  in each of  $AB = 4 \text{ cm}$ ,  $AC = 6 \text{ cm}$ ,  $BD = 1.6 \text{ cm}$  and  $CD = 2.4 \text{ cm}$ .
36. Find X and Y if  $X + Y = \begin{pmatrix} 7 & 0 \\ 3 & 5 \end{pmatrix}$  and  $X - Y = \begin{pmatrix} 3 & 0 \\ 0 & 4 \end{pmatrix}$
37. Let  $A(3, -4)$ ,  $B(9, -4)$ ,  $C(5, -7)$  and  $D(7, -7)$ . Show that ABCD is a trapezium.
38. Find the area of the triangle formed by sides  $x + 4y - 9 = 0$ ,  $9x + 10y + 23 = 0$ ,  $7x + 2y - 11 = 0$ .
39. The angles of elevation and depression of the top and bottom of a lamp post from the top of a 66 m high apartment are  $60^\circ$  and  $30^\circ$  respectively. Find  
(i) The height of the lamp post.  
(ii) The difference between height of the lamp post and the apartment.  
(iii) The distance between the lamp post and the apartment. ( $\sqrt{3} = 1.732$ )
40. A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and 20 cm respectively. Find the cost of milk which can completely fill a container at the rate of ₹40 per litre.
41. Three unbiased coins are tossed once. Find the probability of getting atmost 2 tails or atleast 2 heads.

42. The internal and external diameter of a hollow hemispherical shell are 6 cm and 10 cm respectively. If it is melted and recast into a solid cylinder of diameter 14 cm, then find the height of the cylinder.

**SECTION D****IV ANSWER ALL THE QUESTIONS**

2 X 8 = 16

43. (A) Construct a triangle  $\Delta PQR$  such that  $QR = 5$  cm,  $\angle P = 30^\circ$  and the altitude from P to QR is of length 4.2 cm.

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

**(Or)**

(B) Graph the following linear function  $y = \frac{1}{2}x$ . Identify the constant of variation and verify it with the graph. Also (i) find y when  $x = 9$  (ii) find x when  $y = 7.5$ .

**RELIANCE**