S.S.L.C Model Papers   MATHEMATICS   Set – 18 (2016 April)

I. Four alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the <u>complete answer along with its letter in the space provided against each question.8 x 1 = 8</u>

1. If $T_n = n^2 + 3$ then the value of T_3 is

   (A)6   (B)   9   (C)12   (D)27.

2. Arithmetic mean of 2 and 8 is

   (A)5   (B)   10   (C)16   (D)3.2

3. If the probability of winning a game is 0.3, then what is the probability of losing it ?

   (A)0.1   (B)0.3   (C)0.7   (D)1.3.

4. The degree of the polynomial $2x^2 - 4x^3 + 3x + 5$ is

   (A)0   (B)1   (C)2   (D)3.

5. The distance between the origin and the point (4, - 3) is

   (A) 1 unit   (B) 5 units   (C) 7 units   (D) - 12 units.

6. The slope of the straight line whose inclination is 60° is

   (A)0   (B) $\frac{1}{\sqrt{3}}$ (C) $-\sqrt{3}$ (D)$\sqrt{3}$

7. If $\sin\theta = \frac{3}{5}$ then the value of $\operatorname{cosec}\theta$ is

   (A)$\frac{4}{5}$ (B)$\frac{5}{3}$ (C)$\frac{4}{3}$ (D)$\frac{5}{4}$

8. If the standard deviation of a set of scores is 1-2 and their mean is 10, then the coefficient of variation of the scores is

   (A) 12   (B) 0.12   (C) 20   (D) 120.

II. Answer the following :   6 x 1 = 6

9. If U = { 1, 2, 3, 4, 5 } and A = { 2, 4, 5 } then find A^1.

10. The H.C.F. of 12 and 18 is 6. Find their L.C.M.

11. If f (x) = $2x^2 + 3x + 2$ then find the value of f (2).

12. Two circles of diameters 10 cm and 4 cm, touch each other externally. Find the distance between their centres.

13. State Pythagoras theorem.

14. Write the formula to find the total surface area of a cylinder.

15. Calculate the maximum number of diagonals that can be drawn in an octagon using the suitable formula.

16. Prove that $2 + \sqrt{5}$ is an irrational number.

17. There are 500 wrist watches in a box. Out of these 50 wrist watches are found defective. One watch is drawn randomly from the box. Find the probability that wrist watch chosen is a defective watch.
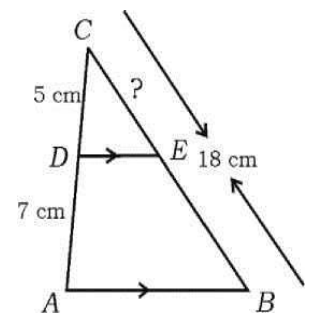
18. Find the product of $\sqrt{3} \; and \; \sqrt[3]{2}$

19. Rationalise the denominator and simplify : $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$

20. Find out the quotient and the remainder when P (x) = $x^3 + 4x^2 - 5x + 6$ is divided

by g (x) = x + 1

OR

Find the polynomial which is to be added to P (x) = $x^4 + 2x^3 - 2x^2 + x - 1$ so

that the resulting polynomial is exactly divisible by $x^2 + 2x - 3$.

21. In the following figure, DE || AB. If AD = 7 cm, CD = 5 cm and BC = 18 cm,

find CE.

22. Given $\sqrt{3}tan\theta$ = 1 and θ is an acute angle. Find the value of $sin3\theta$

23. Find the coordinates of the mid-point of the line segment joining the points (2, 3) and (4, 7).

24. The radius of a cone is 7 cm and its slant height is 10 cm. Calculate the curved surface area of the cone.

OR

Calculate the volume of a right circular cylinder whose radius is 7 cm and height is 10 cm.

25. Solve the quadratic equation $x^2 - 4x + 2 = 0$ by formula method.

26. Construct a tangent at any point P on a circle of radius 3 cm.

27. Draw a plan using the information given below :

[Scale : 20 m = 1 cm]

	Metre To D	
	160	
	120	60 to C
40 to E	80	
	40	40 to B
	From A	

28. In a group of people, 12 people know music, 15 people know drawing and 7 people know both music and drawing. If people know either music or drawing then calculate the number of people in the group.

29. A solid hemisphere of wax of radius 12 cm is melted and made into a cylinder of its base radius 6 cm. Calculate the height of the cylinder.

30. Find the sum of first 20 terms of the series 4 + 7 + 10 +.............................

Class-intervals	frequency
1 — 5	4
6 — 10	3
11 — 15	2
16 — 20	1
	N = 10

IV.

31. Prove that "If two circles touch each other externally then their centres and the point of contact are collinear".

32. Calculate the standard deviation for the following data

33. Find how many 4-digit numbers can be formed using the digits 1, 2, 3, 4, 5, 6 without repetition of the digits. Find out how many of these are less than 5000

OR

If $16 \cdot {}^{n}P_3 = 13 \cdot {}^{n+1}P_3$ then find n.

34. Prove that $\dfrac{Sin(90^0 - \theta)}{1 + Sin\theta} + \dfrac{Cos\theta}{1 - \cos(90^0 - \theta)}$ = 2Secθ

OR

If A = 60°, B = 30° then verify that   cos (A + B) = cos A . cos B - sin A .sin B.

35. Pupils of Xth Standard of a school had arranged for a function at a total cost of Rs. 1,000 which was to be shared equally among them. Since 10 of them failed to join the function each of them had to pay Rs. 5 more. Find the number of pupils in the class.
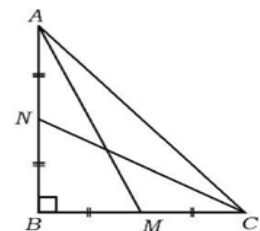
OR

If m and n are the roots of the equation x^2 - 5x + 3 = 0, find the values of
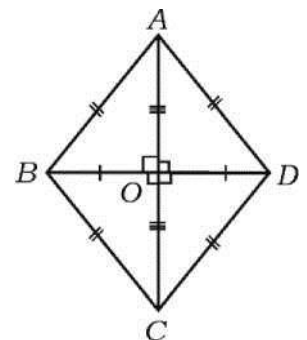
i)$(m + n)^2 + (m - n)^2$

ii)$(m + n)^3 + 4 mn$.

V.

36.In the right angled triangle ABC, ∠ABC = 90°. AM and CN are the medians drawn from A and C respectively to BC and AB. Show that

$4 (AM^2 + CN^2) = 5 AC^2$ **OR**

In the Rhombus ABCD Show that $4AB^2 = AC^2 + BD^2$.

37.   Prove that "If two triangles are equiangular then their corresponding sides are in proportion."

38.   Draw two direct common tangents to two circles of radii 4 cm and 2 cm whose centres are 8 cm apart. Measure the length of the tangents.

39.   In an arithmetic progression, the sum of first term, third term and the fifth term is 39 and the sum of second term, fourth term and the sixth term is 51. Find the tenth term of the sequence.   **OR**

In a geometric progression, the sum of the first 3 terms is 7 and the sum of the next 3 terms is 56. Find the geometric progression.

40.   Solve the equation graphically : x^2 + x - 2 = 0.