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SSLC Model Question Paper-3 (2015)

MATHEMATICS

Max Marks: 80 Time: 2 Hours 45 minutes

No. of Questions: 40 Code No. : 81E

Four alternatives are given for the each question. Choose the correct alternative and write the complete answer along with its alphabet in the space provided. **1 mark × 8 = 8**

1. $A = \{1, 2, 3\}$, $B = \{4, 5, 6\}$ then $A/(B \cap C)$ is,

   (a) $\{1, 2, 3\}$ (b) $\{4, 5, 6\}$

   (c) $\{1, 3, 5\}$ (d) $\{2, 4, 6\}$

2. 15^{th} term of the A.P. $x - 7, x - 2, x + 3$…… is,

   (a) $x + 73$ (b) $x + 63$

   (c) $x + 83$ (d) $x + 53$

3. The rationalising factor of $2 . \sqrt[3]{x}$ is

   (a) $\sqrt{x}$ (b) $4\sqrt{x}$

   (c) $\sqrt[3]{x^2}$ (d) $\sqrt[3]{x}$

4. If $f(x) = 2x^3 + 3x^2 - 11x + 6$ then $f(1)$ is,

   (a) 6 (b) 2

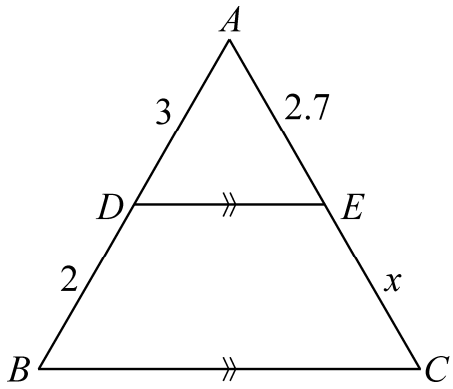
   (c) 1 (d) 0

5. One root of the equation $x^2 - 5x + K = 0$ is 2. Then K is,

   (a) -6 (b) 6

   (c) 5 (d) 2

6. In ΔABC, $DE \| BC$. If AD = 3 cm, BD = 2 cm and AE = 2.7 cm then AC is equal to



(a) 6.5 cm

(b) 4.5 cm

(c) 3.5 cm

(d) 5.5 cm

7. If $1-\cos^2\theta = \frac{3}{4}$, then sin θ is

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{1}{2}$

(c) 1 (d) 0

8. The distance between the origin and the point (12, −5) is,

(a) −5 units (b) 12 units

(c) 7 units (d) 13 units

II **1 mark × 6 = 6**

9. Find the harmonic mean between 1 and 4.

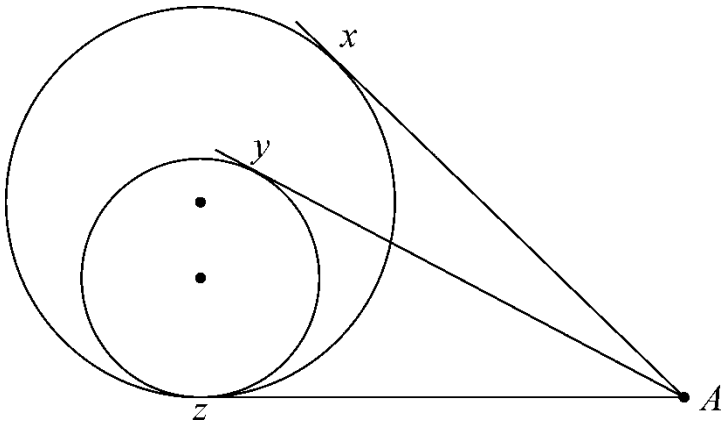
10. Two coins are tossed together. What is the probability of getting exactly one head.

11. Subtract $5\sqrt{x}$ from $9\sqrt{x}$ and express the result in the index form.

12. In the polynomial, $g(x) = x-2$, $q(x) = x^2 - x + 1$ and $r(x) = 4$ find $P(x)$.

13. Find the equation of the line whose angle of inclination θ = 60° and y intercept is −2.

14. In the given figure AX, AY and AZ are the tangents to the circles. If $AX = 8$ cm find AY and AZ.



III **2 marks × 16 = 32**

15. Find geometric progression if $T_3 : T_6 = 1:8$ and $T_5 = 64$.

16. Shekar is one member of a group of 5 persons. If 3 out of these 5 persons is to be chosen for a committee, find the probability of Shekar being in the committee.

17. Find the variance for the following data:

    40, 36, 64, 48, 52.

18. Rationalise the denominator and simplify: $\dfrac{3+\sqrt{6}}{\sqrt{3}+6}$.

19. Divide $P(x) = x^2 + 4x + 4$ by $g(x) = (x+2)$ and verify division algorithm.

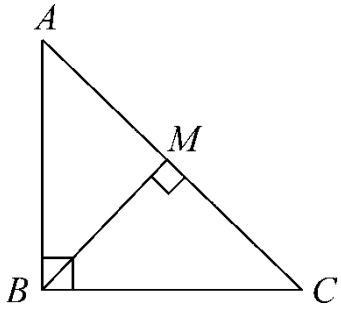
    OR

    Find the quotient and remainder using synthetic division

    $(3x^3 - 2x^2 + 7x - 5) \div (x+3)$.

20. Find the value of q so that the equation $2x^2 - 3qx + 5q = 0$ has one root which is twice the other.

21. In ΔABC, $\angle ABC = 90°$, $BM \perp AC$, $AM = 8x^2$, $MC = 2x^2$, find BM and AB.



22. In what ratio does the point (–2, 3) divide the line segment joining the points (–3, 5) and (4, –9)?

23. Draw a neat diagram of pentahedron and verify Euler's formula.

24. Set A and set B are the subsets of the universal set U.

    $n(A) = 285$, $n(B) = 195$, $n(U) = 500$ and $n(A \cup B) = 410$ find $n(A' \cup B')$.

25. If $nP_r = 840$ and $nC_r = 35$ find the value of n.

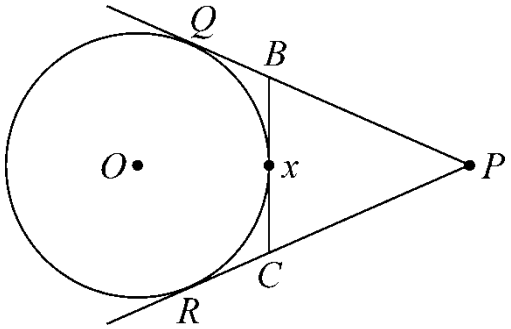
26. Find two numbers whose sum is 18 and sum of their squares is 290.

27. If $3\tan\theta = 1$ find $\sin\theta$ and $\cos\theta$.

OR

Find the value of $\dfrac{4\sin^2 60° - \cos^2 45°}{\tan^2 30° + \sin^2 0°}$.

28. In the given figure, PQ, PR and BC are the tangents to the circle. BC touches the circle at x. If $PQ = 7$ cm then find the perimeter of ΔPBC.



29. The curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find the radius of the base and the total surface area of the cone.

OR

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

30. In a circulating library the number of different books circulated daily are given below:

Types of books	Kannada Novels	Magazines	Science Books	English Novels
Daily Circulated	40	50	25	05

Draw a Pie chart to represent the data.

IV **3 marks × 6 = 18**

31. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has (i) no girls; (ii) at least one boy and one girl.

OR

From 8 gentlemen and 5 ladies a committee of 6 is to be formed. In how many ways can this be done so that the committee contains at least 3 ladies.

32. If a straight line divides two sides of a triangle proportionally, then the straight lines is parallel to third side. (Converse of Thales theorem) Prove.

OR

In a trapezium $ABCD$, $AB \parallel DC$ and $\Delta AED \parallel\!\parallel\!\parallel \Delta BEC$ then prove that $AD = BC$.

33. A rectangular hall is 18 m 72 cm long and 13 m 20 cm broad. It can be paved with square tiles of the same size. Find the least possible number of such tiles.

34. A straight drawn through the point of contact of two circles with centres A and B intersect the circles at P and Q respectively. Show that AP and BQ are parallel.

OR

Tangents AP and AQ are drawn to circle with centre O, from an external point A. Prove that $\angle PAQ = 2\angle OPQ$.

35. Show that: $\frac{\cos A}{1-\tan A}+\frac{\sin A}{1-\cot A}=\sin A+\cos A$.

OR

From a point 50 m above the ground the angle of elevation of a cloud is 30° and the angle of depression of its reflection is 60°. Find the height of the cloud above the ground.

36. Plan out and find the area of the field from the following notes from the field work *ABCDE*. (Scale 20 m = 1 cm).

	Meters to *D*	
to *E* 80	150 100 80 30	70 to *C* 40 to *B*
	From *A*	

V **4 marks × 4 = 16**

37. In an A.P. if the 12^{th} term is −13 and the sum of the first four terms is 24, what is the sum of the first 10 terms?

OR

The sum of first three terms of a G.P. is 16 and sum of the next three terms is 128. Determine the first term, common ratio and sum to *n* terms of the G.P.

38. Solve graphically: $2x^2-x-3=0$.

39. In a right angled triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides. Prove.

40. Construct two direct common tangents to two circles of radii 5 cm and 2.5 cm whose centres are 11 cm apart. Measure its length.

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