

K.S.E.E.B., Malleshwaram, Bangalore
SSLC Mathematics-Model Question Paper-1 (2015)

Regular Private Candidates (New Syllabus)

Max Marks: 100

Time: 3 Hours

No. of Questions: 50

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 \times 8 = 8**

1. Which one of the following is a correct relationship?

(a) $nP_r = nC_r \times r!$

(b) $nC_r = nP_r \times r!$

(c) $nP_r = nC_r \div r!$

(d) $nC_r = nP_r \div r!$

2. Probability of getting 3 heads or 3 tails in tossing a coin 3 times is,

(a) $\frac{1}{8}$

(b) $\frac{1}{2}$

(c) $\frac{3}{8}$

(d) $\frac{1}{4}$

3. The sides of two similar triangle are in the ratio 2 : 3. Then their areas are in the ratio

(a) 9 : 4

(b) 4 : 9

(c) 2 : 3

(d) 3 : 2

4. If $A \subset B$ then, $A \cap B$ is

(a) A/B

(b) B/A

(c) B

(d) A

5. Mean and standard deviation of a data are 48 and 12 respectively. The coefficient of variation is,

RP

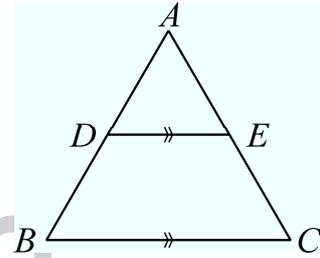
- (a) 48 (b) 42
(c) 15 (d) 25

6. If $ax^2 + bx + c = 0$ has equal roots. Then c is equal to

- (a) $\frac{b^2}{4a}$ (b) $\frac{b^2}{2a}$
(c) $\frac{b^2}{a}$ (d) $-\frac{b^2}{4a}$

7. In the adjoining figure, D and E are the mid points of AB and AC respectively. If $DE = 4$ cm, then BC is equal to

- (a) 4 cm (b) 6 cm
(c) 8 cm (d) 12 cm



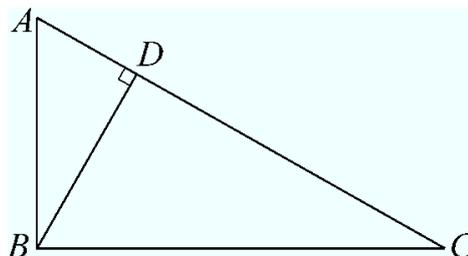
8. $(1 + \tan^2 60^\circ)^2$ is equal to

- (a) 1 (b) 2
(c) 16 (d) 4

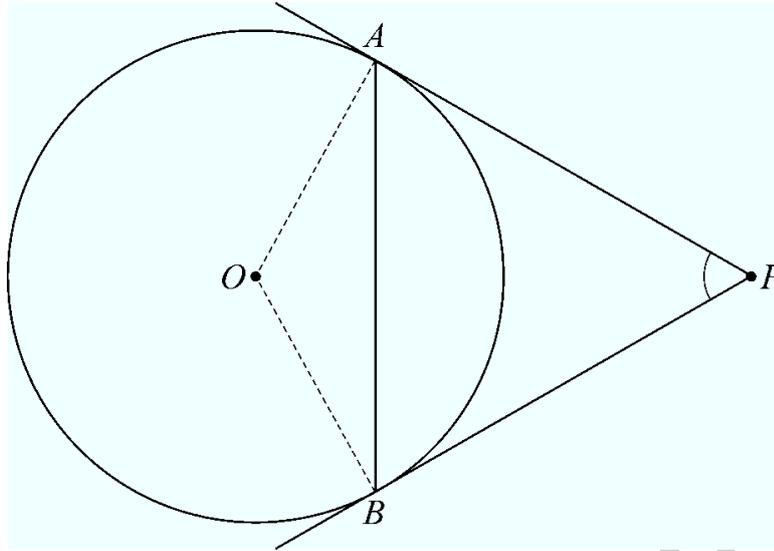
II

1 mark \times 6 = 6

9. Express 6762 as the product of prime factors.
10. Find the zeroes of the polynomial $4a^2 - 49$.
11. For the equation $143 = x^2 - 1$, find the value of x .
12. Form the quadratic equation whose roots are 3 and 5.
13. In $\triangle ABC$, $\angle ABC = 90^\circ$ and $BD \perp AC$. If $BD = 8$ cm and $AD = 4$ cm, find CD .



14. O is the centre of the circle. P is external point. If $AP = 8$ cm, $AP = BP$ and $\angle APB = 60^\circ$ then find the length of the chord AB .



III

2 marks \times 26 = 52

15. In a school, the strength of 8th, 9th and 10th standards are respectively 48, 42 and 60. Find the least number of books required to be distributed equally among the students of 8th, 9th and 10th standard.
16. In a town 85% of the people speak English, 40% speak Kannada and 20% speak Hindi. Also 42% speak English and Kannada, 23% speak Kannada and Hindi and 10% speak English and Hindi. Find the percentage of people who can speak all the three languages.
17. Find the sum of all natural numbers between 1 and 201 which are divisible by 5.
18. The 10th term of a G.P. is 320 and 6th term is 20. Find the progression.
19. It is required to seat 5 men and 4 women in a row so that the women occupy the even places. How many such arrangements are possible?
20. How many maximum diagonals that can be drawn in a octagon?

OR

Everybody in a function shakes hand with everybody else. The total number of handshakes is 45. Find the number of persons in the function.

RP

21. There are 2 red and 2 yellow flowers in a basket. A child picks up at random three flowers. What is the probability of picking up both the yellow flowers?

22. Rationalise the denominator and simplify: $\frac{4\sqrt{3} + \sqrt{2}}{\sqrt{3} + \sqrt{2}}$.

23. Multiply: $\sqrt[3]{4} \times \sqrt[5]{2}$.

24. Solve by using formula: $15m^2 - 11m + 2 = 0$.

OR

If one root of the equation $x^2 + px + q = 0$ is 3 times the other, then prove that $3p^2 = 16q$.

25. Find the value of $\frac{\sin 30^\circ + \tan 45^\circ - \operatorname{cosec} 60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$.

26. Find the slope of the line perpendicular to the line joining the points (1, 7) and (-4, 3).

27. A point $P(2, -1)$ is equidistant from the points $(a, 7)$ and $(-3, a)$. Find a .

28. Draw a circle of radius 4 cm and construct a pair of tangents such that angle between them is 50° .

29. Draw the graph (network) for the following:

Nodes = 7, Regions = 5, Arcs = 10.

30. Draw a plan for the recordings from the surveyor's field work book given below:
(Scale 25 m = 1 cm)

	To D meters	
	300	
	200	100 to C
to E 50	150	75 to B
	100	
	From A	

RP

31. If $A = \{-3, -1, 0, 4, 6, 8, 10\}$

$B = \{-1, -2, 3, 4, 5, 6\}$ and

$C = \{-6, -4, -2, 2, 4, 6\}$. Show that

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C).$$

32. In the H.P. $\frac{1}{5}, \frac{1}{3}, 1, -1, \dots$ find T_{10} .

33. Prove that: $nC_r = nC_{n-r}$.

34. Find standard deviation for the given data:

x	68	72	80	84	92	100
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35. Solve the equation using completing the square: $x^2 + 6x - 7 = 0$.

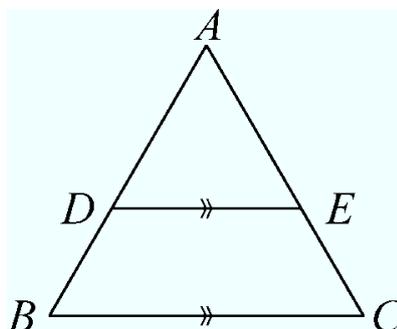
36. Find the value of K so that equation $x^2 + 4x + (K + 2) = 0$ has one root equal to zero.

37. Draw a circle of radius 3 cm and construct a pair of tangents such that angle between them is 70° .

38. Find the TSA of a cone, whose slant height is 9 cm and radius of the base is 14 m.

39. Draw a neat diagram of hexahedron and verify Euler's formula.

40. In $\triangle ABC$, $DE \parallel BC$ and $\frac{AD}{BD} = \frac{2}{3}$. If $AE = 3.7$ cm find BC .



RP

IV

3 marks \times 6 = 18

41. Draw Pie chart to represent the following data:

Name of the sport	Number of students
Foot ball	35
Tennis	14
Volley ball	16
Hockey	7

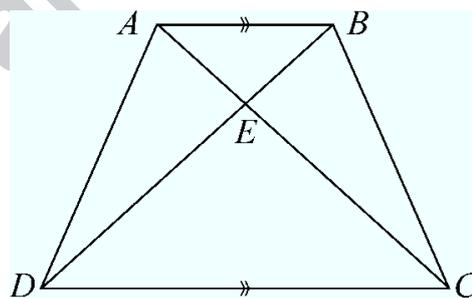
42. Find the divisor $g(x)$, when the polynomial $P(x) = 4x^3 + 2x^2 - 10x + 2$ is divided by $g(x)$ and the quotient and remainder obtained are $(2x^2 + 4x + 1)$ and 5 respectively.

OR

If the quotient obtained on dividing $(8x^4 - 2x^2 + 6x - 7)$ by $(2x + 1)$ is $(4x^3 + px^2 - qx + 3)$ then find the value of p, q and also the remainder.

43. If two circles touch each other internally their centres and the point of contact are collinear. Prove.

44. In the trapezium $ABCD$, $AB \parallel DC$ and $\Delta AED \parallel \Delta BEC$. The prove that $AD = BC$.



OR

D, E and F are the mid-points of sides of ΔABC . P, Q, R are the mid points of sides DEF . This process of marking the mid-points and forming a new triangle is continued. How are the areas of these triangles related?

RP

45. Show that: $\frac{1 - \tan^2 \theta}{\cot^2 \theta - 1} = \tan^2 \theta$.

OR

Show that $\sec A(1 - \sin A)(\sec A + \tan A) = 1$.

46. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the capsule is 14 mm and the width is 5 mm. Find the surface area.

OR

The diameter of the internal and external surfaces of a hollow hemispherical shell are 6 cm and 10 cm respectively. It is melted and recast into a solid cone of diameter 14 cm. Find the height of the cone.

V

4 marks × 4 = 16

47. In an A.P. whose first term is 2 the sum of first five terms is one fourth the sum of the next five terms. Show that $T_{20} = -112$ and also find S_{20} .

OR

Sum of three terms in a G.P. is 31 and their product is 125. Find the numbers.

48. A man travels a distance of 196 km by train and returns in a car which travels at a speed of 21 km/hour more than the train. If the total journey takes 11 hours, find the average speed of the train and the car respectively.
49. In a right angled triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides. Prove.
50. Construct a transverse common tangent to two circles of radii 4 cm and 2 cm having their centre 10 cm apart. Measure the length of the TCT and verify by calculation.

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