

**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,

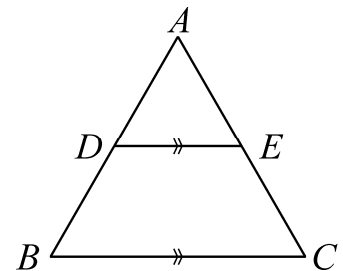
- (a) 48 (b) 42  
 (c) 15 (d) 25

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



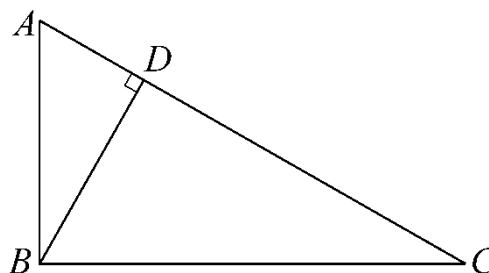
8.  $(1 + \tan^2 60^\circ)^2$  is equal to

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

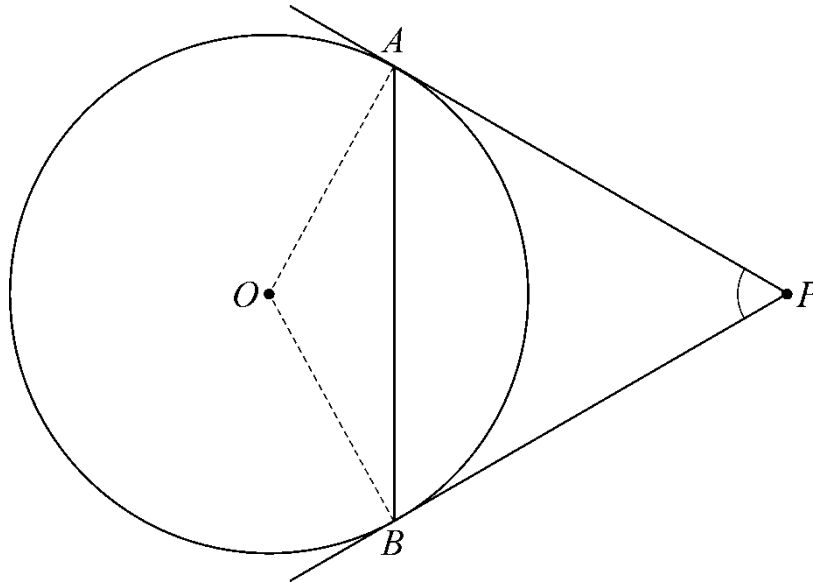
**II**

**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 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> standards are respectively 48, 42 and 60. Find the least number of books required to be distributed equally among the students of 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> 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 10<sup>th</sup> term of a G.P. is 320 and 6<sup>th</sup> 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.

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  $50^\circ$ .
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 $A$	

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

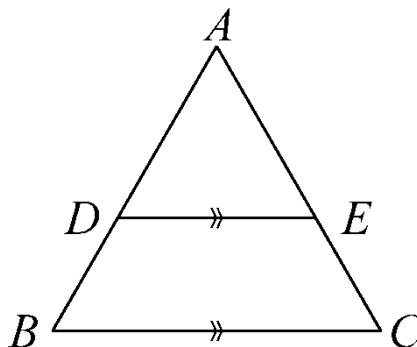
32. In the H.P.  $\frac{1}{5}, \frac{1}{3}, 1, -1, \dots$  find  $T_{10}$ .

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  $70^\circ$ .
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  $BC$ .



## 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

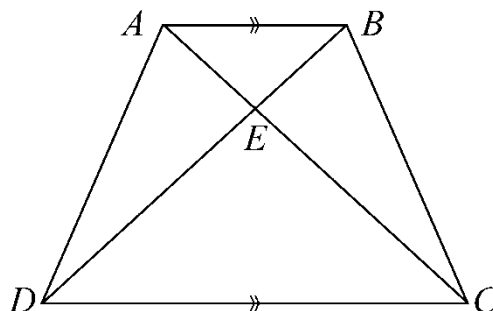
42. Find the divisor  $g(x)$ , when the polynomial  $P(x) = 4x^3 + 2x^2 - 10x + 2$  is divided by  $g(x)$  and the quotient and remainder obtained are  $(2x^2 + 4x + 1)$  and 5 respectively.

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  $\triangle AED \parallel \triangle BEC$ . The prove that  $AD = BC$ .



OR

$D, E$  and  $F$  are the mid-points of sides of  $\triangle ABC$ .  $P, Q, R$  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?

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  $\times$  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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