

**K.S.E.E.B., Malleshwaram, Bangalore**  
**SSLC Model Question Paper-4 (2015)**  
**MATHEMATICS**

Max Marks: 80

Time: 2 Hours 45 minutes

No. of Questions: 40

Code No. : 81E

**I 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. The relationship between the dividend ( $a$ ), divisor ( $b$ ), quotient ( $q$ ) and the remainder ( $r$ ) is

(a)  $a = (b + q) \times r$

(b)  $a = (b - q) + r$

(c)  $a = (b - r) \times q$

(d)  $a = (b \times q) + r$

2. The formula used to find the coefficient of variation is

(a)  $CV = \frac{\sigma}{\bar{X}} \times 100$

(b)  $CV = \frac{\bar{X}}{\sigma} \times 100$

(c)  $CV = \sigma \times \bar{X} \times 100$

(d)  $CV = \frac{\sigma \times \bar{X}}{100}$

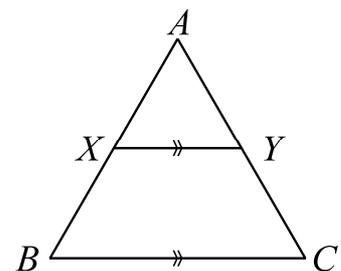
3. In the adjoining figure  $XY \parallel BC$ . Then  $\frac{AX}{AB}$  is equal to

(a)  $\frac{AX}{AY}$

(b)  $\frac{AX}{XB}$

(c)  $\frac{AY}{AC}$

(d)  $\frac{AC}{AY}$



4. The value of  $\frac{\tan \theta}{\cot \theta}$  is

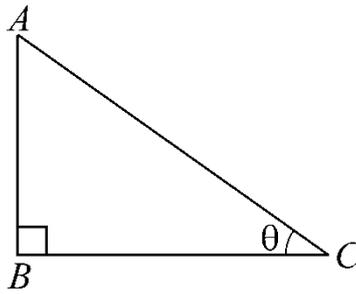
(a) 0

(b) 1

(c)  $\frac{1}{\cot \theta}$

(d)  $\frac{1}{\tan \theta}$

5. In this figure, the slope of  $AC$  is



(a)  $\frac{AB}{BC}$

(b)  $\frac{BC}{AB}$

(c)  $\frac{AC}{AB}$

(d)  $\frac{AC}{BC}$

6.  $TA$  and  $TB$  are tangents to a circle from an external point  $T$ . If  $\angle ATB = 60^\circ$ , then the triangle  $TAB$  is

(a) right angled triangle

(b) equilateral triangle

(c) obtuse angled triangle

(d) isosceles triangle

7. Two dice marked 1 to 6 on each is rolled once simultaneously. The probability of getting equal numbers on their top is

(a)  $\frac{6}{36}$

(b)  $\frac{36}{6}$

(c) 1

(d) 0

8. If  $f(x) = x^2 + x - 1$ , then the value of  $f(1)$  is

(a) 3

(b) -1

(c) 1

(d) 0

## II

**1 mark  $\times$  6 = 6**

9. If  $A$  and  $B$  are disjoint sets, then what is value of  $n(A \cup B)$ ?

10. In a sequence if  $T_n = n^2 + 4$  and  $T_n = 200$ , find the value of  $n$ .

11. If  $nC_8 = nC_{12}$ , find the value of  $n$ .

12. Find the zeroes of the polynomial  $x^2 + 5x - 14$ .

13. Find the distance between the origin and the point  $(12, -6)$ .
14. Find the surface area of a hemispherical bowl of diameter 14 cm.

**III****2 marks  $\times$  16 = 32**

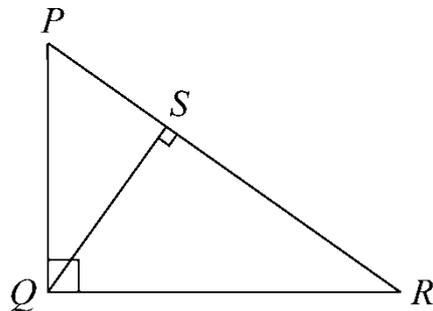
15. Prove that  $\sqrt{3} + \sqrt{2}$  is an irrational number.
16. In a group of passengers 100 can speak Kannada 50 can speak English and 25 can speak both Kannada and English. Find the total number of passengers and find how many can speak only Kannada.
17. Classify the following into permutations and combinations.
- (a) Arrangement of 7 books in a shelf taking 3 books at a time.
- (b) Number of shake hands by 10 people among themselves.
- (c) Number of ways by which 5 people occupy 5 seats.
- (d) Choosing a committee of 7 by 10 people.
18. The maximum number of diagonals in a polygon is 14. Find the number of sides.
19. There are 6 red, 7 white and 7 black marbles in a box. Two balls are drawn from the box at random. Find the probability that both the balls are red.
20. Find the product of  $\sqrt[4]{2} \times \sqrt[3]{3}$ .
21. Rationalise the denominator and simplify  $\frac{\sqrt{5} + 3}{3 - \sqrt{5}}$ .
22. If  $P(x) = x^3 + 4x^2 - 5x + 6$  and  $g(x) = x + 1$ . Divide  $P(x)$  by  $g(x)$  and verify division algorithm.

OR

The polynomials  $ax^3 + 3x^2 - 13$  and  $2x^3 - 4x + a$  are divided by  $(x - 3)$ . If the remainder is same in each case, find the value of  $a$ .

23. Solve by using the formula:  $2y^2 + 6y = 3$ .

24. In this figure.  $\angle PQR = 90^\circ$  and  $QS \perp PR$ . If  $PQ = 1.5$  cm and  $QR = 2$  cm, calculate the length of  $QS$ .

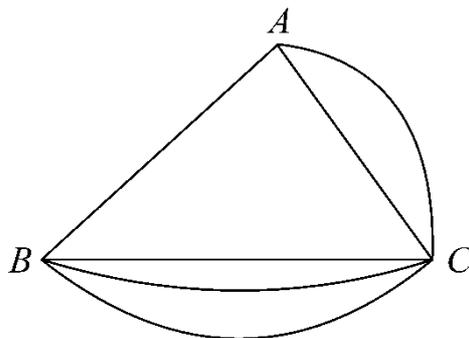


25. Show that  $\frac{1 + \sin \theta}{1 - \sin \theta} = (\sec \theta + \tan \theta)^2$ .
26. Find the equation of the line whose angle of inclination is  $60^\circ$  and  $y$ -intercept is  $-2$ .
27. Draw a circle of diameter 6 cm and construct two tangents at the ends of the radii such that the angle between the radii is  $110^\circ$ .
28. The slant height and diameter of the base of a conical tomb are 25 m and 14 m respectively. Find the cost of painting its curved surface area at the rate of Rs. 50 per square meter.

OR

A circus tent is cylindrical upto a height of 3 m and conical above it. If the diameter of the base is 105 m and the slant height of the conical part is 53 m, find the area of canvas required to cover the tent.

29. Verify Euler's formula for the following network.



30. Plan out the field using the following measurements (use the scale 20 m = 1 cm)

	To $D$ in meters	
to $E$ 100	140	60 to $C$
	100	
	80	
	20	
	From $A$	

IV

3 marks  $\times$  6 = 18

31. The sum of 6 terms which forms an AP is 345. The difference between the first and last terms is 55. Find the terms.
32. Calculate the standard deviation of the following scores by assumed mean method. (Assumed mean = 60).

Scores ( $X$ )	Frequency ( $f$ )
50	4
55	6
60	10
65	6
70	4

33. Mohan had bought certain number of books for Rs. 48. If he had bought 4 more for the same amount, then the cost of each book would have been reduced by 1 rupee. Find the number of books bought by him.

OR

A man travels a distance of 196 km by train and returns in a car which travels at a speed of 21 km/hour faster than the train. If the total journey takes 11 hours, find the speed of train and car.

34. If  $\pi = 180^\circ$ ,  $A = \frac{\pi}{3}$  and  $B = \frac{\pi}{6}$ , prove that  $\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$ .

OR

Prove that:  $\frac{1 + \cos \theta}{1 - \cos \theta} - \frac{1 - \cos \theta}{1 + \cos \theta} = 4 \cot \theta \cos \theta$ .

35. If two circles touch each other, prove that their centres and their point of contact are collinear.
36. In a trapezium, prove that the line joining the midpoints of non-parallel sides are parallel to the parallel sides of the trapezium.

OR

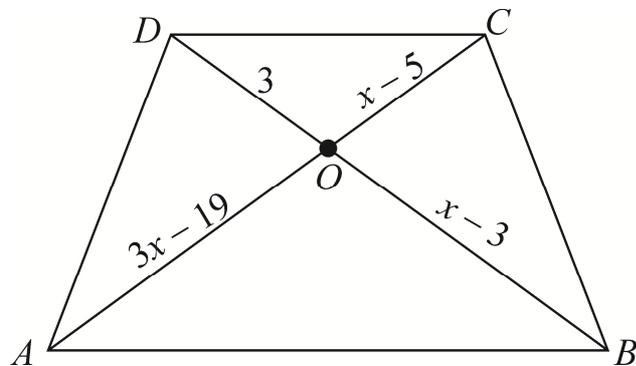
In trapezium  $ABCD$ ,  $AB \parallel CD$ .

If  $AO = 3x - 19$ ,

$OC = x - 5$ ,

$BO = x - 3$  and

$OD = 3$ , find  $x$



V

4 marks  $\times$  4 = 16

37. In a right angled triangle, prove that the square on the hypotenuse is equal to sum of the squares on the other two sides.
38. Solve graphically:  $x^2 + x - 2 = 0$ .
39. Draw two circles of radii 4.5 cm and 2 cm at a distance of 11 cm apart from their centres. Construct direct common tangents to them and measure their length.
40. The sum of three terms of an AP is 21 and the product of first and third term exceeds the second term by 6. Find three terms.

OR

The third term of an AP is 7 and the 7<sup>th</sup> term exceeds 3 times the third term by 2. Find the first term and the common difference and the sum of first 20 terms.

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