

K.S.E.E.B., Malleshwaram, Bangalore
SSLC Mathematics-Model Question Paper-2 (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. $(1 + \cos \theta)(1 - \cos \theta)$ is equal to

(a) $\sin^2 \theta$

(b) $\tan^2 \theta$

(c) 1

(d) 0

2. If $P = \{2, 3, 4\}$ and $Q = \{3, 5, 7\}$ then P/Q is equal to

(a) $\{3, 7\}$

(b) $\{2, 4\}$

(c) $\{3\}$

(d) $\{2, 4, 3, 7\}$

3. If $nP_2 = 90$ then n is equal to

(a) 90

(b) 45

(c) 20

(d) 10

4. If $x = 1$ is a zero of the polynomial $f(x) = x^3 - 2x^2 + 4x + K$ then the value of K is

(a) -3

(b) 3

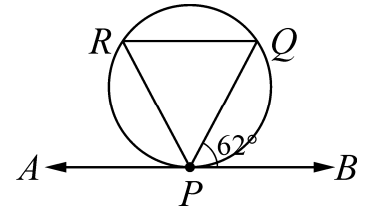
(c) 4

(d) -4

5. $\sin A \cdot \cos A \cdot \tan A + \cos A \cdot \sin A \cdot \cot A$ is equal to

- (a) $\sin^2 A - \cos^2 A$ (b) $\tan^2 A + \cot^2 A$
 (c) $\sin^2 A + \cos^2 A$ (d) $\sin^2 A + \tan^2 A$

6. In the given figure, APB is tangent to the circle at the point P on the circle. PQ is a chord. If $\angle BPQ = 62^\circ$ then $\angle PRQ =$



- (a) 28° (b) 118°
 (c) 124° (d) 62°

7. If $1 + 2 + 3 + \dots + n = 78$ then the value of n is,

- (a) 13 (b) 12
 (c) 11 (d) 16

8. The product of $\sqrt[3]{2}$ and $\sqrt{2}$ is

- (a) $\sqrt[6]{72}$ (b) $\sqrt[6]{24}$
 (c) $\sqrt[6]{16}$ (d) $\sqrt[6]{4}$

II

1 mark \times 6 = 6

9. Using Euclid's division algorithm, find the HCF of 65 and 117.

10. A die is rolled. Find the probability of getting a square number.

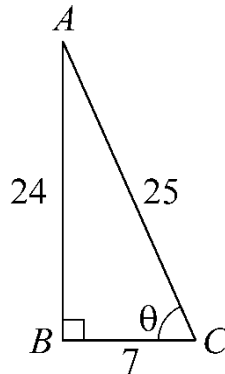
11. Using Euler's formula verify:

$N = 6, R = 6, A = 10.$

12. Verify Euler's formula for a Hexahedron.

13. The height of a right circular cylinder is 14 cm, and the radius of its base is 2 cm. Find its curved surface area.

14. Find $\sin \theta$ and $\cos \theta$ using the following figure, if $AB = 24$ units, $AC = 25$ units and $BC = 7$ units.



III

2 marks \times 26 = 52

15. Prove that $\sqrt{3} + \sqrt{2}$ is an irrational number.
16. If $U = \{4, 8, 12, 16, 20, 24, 28\}$, $A = \{8, 16, 24\}$, and $B = \{4, 16, 20, 28\}$ verify that $(A \cup B)' = A' \cap B'$.
17. The arithmetic mean of two numbers is 17 and their geometric mean is 15. Find the numbers.
18. The first term of a G.P. is 50 and the fourth term is 1350. Find its fifth term.
19. How many 3-digit numbers can be formed using the digits 1, 2, 3, 4, 5 and 6 without repeating any digit? How many of these are even numbers.
20. If $nP_r = 336$ and $nC_r = 56$ find n and r .
21. There are 6 red, 7 white and 7 black balls in a basket. Two balls are drawn at random. Find the probability that the balls are red or both the balls are black.
22. Performance of two players is given below:

Player	Mean	SD
Arun	70	4.2
Bharath	60	3.0

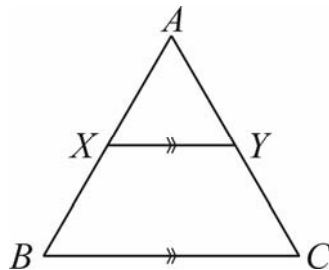
Who is more consistent in performance?

23. Draw a pie chart for the following data:

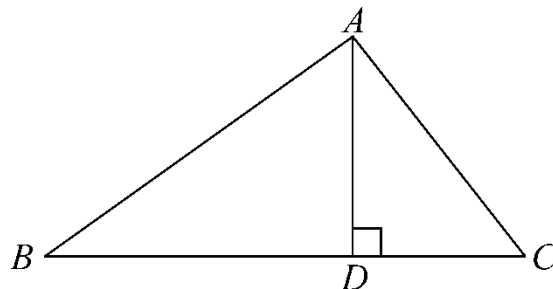
Particulars	Hostel fee	College fee	Miscellaneous
Amount (Rs.)	360	120	60

24. Find the value of p so that the equation $4x^2 - 8px + 9 = 0$ has roots whose difference is 4.

25. In $\triangle ABC$. $XY \parallel BC$ and XY divides the triangle into two parts of equal area. Find $BX : AB$. [Hint: $\triangle ABC = 2\triangle AXY$]



26. In the given figure:



$AD \perp BC$. Prove that $AB^2 + CD^2 = BD^2 + AC^2$.

27. $ABCD$ is a square. F is the midpoint of AB . BE is one third of BC . If the area of $\triangle FBE$ is 108 cm^2 . Find the length of AC .

28. The line passing through the points $(2, 7)$ and $(3, 6)$ and parallel to a line joining $(9, a)$ and $(11, 3)$. Find a .

29. Find the co-ordinates of the midpoint of the line joining the points $(-3, 10)$ and $(6, -8)$.

30. Construct a pair of tangents to a circle of radius 3.5 cm from a point 3.5 cm away from the circle. Measure the length of the tangent.

31. Draw Venn diagram to illustrate the following:

(1) $A \cap B \setminus C$

(2) $(A \cup B) \cap C$

(3) $C \cap (B \cup A)$

(4) $(A \cup B) \setminus (A \cup C)$

32. Find the sum of all the first n natural numbers.

33. Find the value of

(1) nP_1

(2) nP_0

(3) nC_1

(4) nC_0

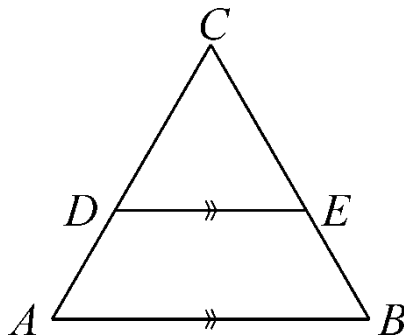
34. Draw the Pie Chart for the following data:

Teak Wood	Rose Wood	Devadaru	Eucalyptus
360	300	285	135

35. Find the product of $\sqrt[3]{2}$ and $\sqrt[4]{3}$.

36. Form the equation whose roots are $(2 + \sqrt{3})$ and $(2 - \sqrt{3})$.

37. In the given figure $DE \parallel AB$. $AD = 7$ cm, $CD = 5$ cm and $BC = 18$ cm. Find BE and CE .



38. Draw a chord of length 4 cm in a circle of radius 2.5 cm. Construct tangents at the ends of the chord.

39. C.S.A. of a cylindrical pipe is 550 cm^2 . If the height of the pipe is 2.5 cm find the diameter of the base.

40. Write two condition for transversibility of graph or network.

IV

3 marks \times 6 = 18

41. The third term of an A.P. is 8 and the ninth term exceeds three times the third term by 2. Find the sum of its first 19 terms.

OR

In a H.P. $T_4 = \frac{1}{11}$ and $T_{14} = \frac{3}{23}$ find T_{19} .

42. If $(x^3 + ax^2 - bx + 10)$ is divisible by $x^2 - 3x + 2$ find the values of a and b .

OR

Using the remainder theorem find the remainder when $P(x) = x^3 + 3x^2 - 5x + 8$ is divided by $g(x) = x - 3$. Verify the result by actual division.

43. The age of a man is twice the square of the age of his son. Eight year hence the age of the man will be 4 years more than three times the age of his son. Find their present age.

OR

Solve by completing the square $2x^2 + 5x - 3 = 0$.

44. Prove that $\sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}} + \sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} = 2 \sec \theta$.

OR

Prove that $\sin^2 30^\circ \cos^2 45^\circ + 4 \tan^2 30^\circ + \frac{1}{2} \sin^2 90^\circ + \frac{1}{8} \cot^2 60^\circ = 2$.

45. Simplify: $\frac{7\sqrt{3}}{\sqrt{10} - \sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6} + 2}$.

46. The tangents drawn from an external point to a circle (i) are equal, (ii) subtend equal angles at the centre.

V

4 marks × 4 = 16

47. From the top of a cone of base radius 24 cm and height 45 cm, a cone of slant height 17 cm is cutoff. What is the volume of the remaining frustum of the cone?

OR

- (a) The radii of two right circular cylinders are in the ratio 2 : 3 and the ratio of their curved surface area is 5 : 6. Find the ratio of their heights.
- (b) A right circular cone is of height 3.6 cm and radius of its base is 1.6 cm. It is melted and recast into a right circular cone with radius of its base 1.2 cm. Find the height of the cone so formed.

48. State and prove basic proportionality theorem.

49. Solve graphically $x^2 - 3x - 10 = 0$.

50. Construct a transverse common tangent to two circles of radii 3 cm and 2 cm with their centres 9 cm apart. Measure the length of the tangent and verify.

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