

CCE RRಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**Code No. : **81-E**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / **English Version**)(ಹೊಸ ಪಠ್ಯಕ್ರಮ / **New Syllabus**)(ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / **Regular Repeater**)*General Instructions :*

- i) The Question-cum-Answer Booklet consists of objective and subjective types of questions having 40 questions.
- ii) Space has been provided against each objective type question. You have to choose the correct choice and write the complete answer along with its letter in the space provided.
- iii) For subjective type questions enough space for each question has been provided. You have to answer the questions in the space.
- iv) Follow the instructions given against both the objective and subjective types of questions.
- v) Candidates should not write the answer with pencil. Answers written in pencil will not be evaluated. (Except Graphs, Diagrams & Maps)
- vi) In case of Multiple Choice, Fill in the blanks and Matching questions, scratching / rewriting / marking is not permitted, thereby rendering to disqualification for evaluation.
- vii) Candidates have extra 15 minutes for reading the question paper.
- viii) **Space for Rough Work** has been printed and provided at the bottom of each page.
- ix) Do not write anything in the space provided in the right side margin.

(SPACE FOR ROUGH WORK)

- I. Four alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter in the space provided against each question. $8 \times 1 = 8$

- By applying Euclid's division lemma 72 and 28 can be expressed as

(A) $28 = (72 - 16) \times 2$	(B) $72 = (28 \times 2) + 16$
(C) $72 = (28 \times 2) - 16$	(D) $16 = 72 - (28 + 2)$.
- A and B are two sets. If $n(A) = 20$, $n(B) = 30$ and $n(A \cup B) = 40$, then $n(A \cap B)$ is equal to

(A) 50	(B) 10
(C) 40	(D) 70.
- If a , b and c are in Arithmetic progression then $\frac{b-a}{c-b}$ is equal to

(A) $\frac{b}{a}$	(B) 0
(C) 1	(D) $2a$.
- "The occurrence of one event excludes the occurrence of other event." In a random experiment of probability theory it is called

(A) Complementary event	(B) Impossible event
(C) Mutually exclusive event	(D) Certain event.
- The standard deviation of a set of scores is 1.6. The variance of these scores is

(A) 0.4	(B) 1.96
(C) 0.04	(D) 2.56.

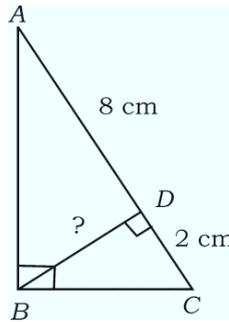
(SPACE FOR ROUGH WORK)



6. The product of $2\sqrt[3]{2}$ and $3\sqrt[3]{4}$ is

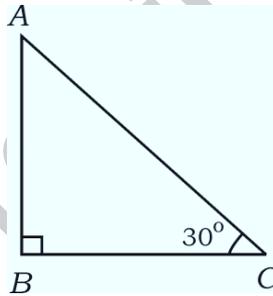
- (A) 6 (B) 8
(C) 10 (D) 12.

7. In the following figure $\angle ABC = 90^\circ$ and $BD \perp AC$. If $AD = 8$ cm, $CD = 2$ cm, then the length of BD is



- (A) 4 cm (B) 8 cm
(C) 16 cm (D) 10 cm.

8. In the following figure $AB \perp BC$ and $\angle ACB = 30^\circ$, given $BC = \sqrt{300}$ m. The length of AB is



- (A) 10 m (B) 100 m
(C) $10\sqrt{3}$ m (D) $100\sqrt{3}$ m.

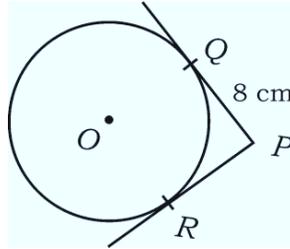
(SPACE FOR ROUGH WORK)



II. Answer the following :

 $6 \times 1 = 6$

9. If $T_n = 2n^2 + 5$ then find T_3 .
10. Write the degree of the polynomial $19x + \sqrt{3}x^3 + 14$.
11. Rationalise the surd $(\sqrt{5} + \sqrt{2})$ to get a rational number.
12. PQ and PR are tangents to given circle as shown in the figure. If $\angle RPQ = 90^\circ$ and $PQ = 8$ cm, find the radius of the circle.



13. Write the 'discriminant' of the equation $ax^2 + bx + c = 0$.
14. Write the formula to find the total surface area of a right circular cylinder.

III. Answer the following :

15. Show that $3 + \sqrt{5}$ is an irrational number. 2
16. Draw Venn diagrams to illustrate the following sets :
 - (i) $(A \cup B)'$ (ii) $A' \cap B$ 2
17. In a Harmonic Progression $T_5 = \frac{1}{12}$ and $T_{11} = \frac{1}{15}$. Find T_1 . 2
18. If ${}^n P_2 = 90$, then find the value of n . 2
19. An unbiased cubical die whose faces are numbered 1 to 6 is rolled once. Find the probability of getting a square number on the top face. 2

(SPACE FOR ROUGH WORK)



20. Rationalise the denominator and simplify :

2

$$4\sqrt{\frac{1}{3}} + \frac{1}{2}\sqrt{48}.$$

21. Find the roots of the equation $x^2 + 7x + 12 = 0$ by using the formula.

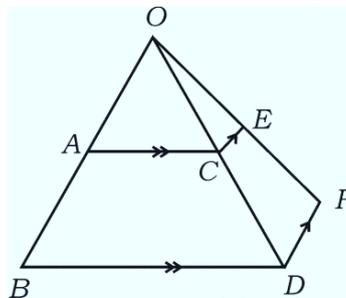
2

OR

Solve $x^2 + 6x - 7 = 0$ by the method of completing the square.

22. The length of a rectangular playground is 2 m longer than its breadth. If the area of the playground is 195 sq.m, find the length and breadth of the field. 2

23. In the following figure, $AC \parallel BD$ and $CE \parallel DF$. If $OA = 12$ cm, $AB = 9$ cm, $OC = 8$ cm and $EF = 4.5$ cm, find OE .



OR

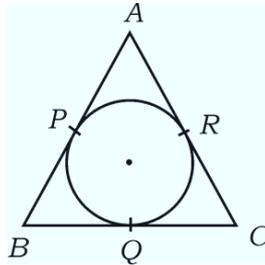
If the area of two similar triangles are equal, then they are congruent. Prove. 2

24. If $24 \tan \theta = 7$, then find (i) $\sin \theta$, (ii) $\cos \theta$. 2
25. Find the equation of a straight line having angle of inclination 60° and y -intercept 2. 2
26. The distance between the points $(3, 1)$ and $(0, x)$ is 5 units. Find x . 2

(SPACE FOR ROUGH WORK)



27. In the given figure, AB , BC and AC are tangents to the circle at P , Q and R . If $AB = AC$, show that Q is the mid-point of BC . 2

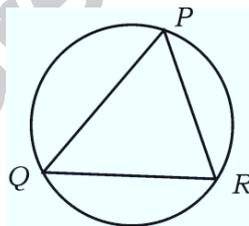


28. The radii of two circular ends of a frustum of a cone shaped dust bin are 15 cm and 8 cm. If its depth is 63 cm, find the volume of the dust bin. 2
29. Draw a plan for the recordings from Surveyor's field work book given below : 2

[Scale : 20 m = 1 cm]

	To D (m)	
To E 60	150	60 to C
	120	
	80	
	30	
	From A	

30. Verify Euler's formula for the given network : 2



(SPACE FOR ROUGH WORK)



- IV. 31. Prove that $\frac{{}^n C_r}{{}^{(n-1)} C_{r-1}} = \frac{n}{r}$ where $1 \leq r \leq n$.

OR

A polygon has 44 diagonals. Find the number of sides of the polygon.

3

32. Calculate the standard deviation of the following data (by Assumed mean method).

3

Assumed Mean = 25

C.I.	0 — 10	10 — 20	20 — 30	30 — 40	40 — 50
f	7	10	15	8	10

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

OR

If the quotient obtained on dividing $x^4 + 10x^3 + 35x^2 + 50x + 29$ by $(x + 4)$ is $x^3 - ax^2 + bx + 6$ then find a and b . Also find the remainder.

(Hint : Apply Synthetic division)

3

34. In an equilateral triangle ABC , $AD \perp BC$. Prove that

$$AB^2 + CD^2 = \frac{5}{4} AC^2.$$

OR

In ΔABC , $AD \perp BC$ and $BD : CD = 3 : 1$. Prove that

$$2(AB^2 - AC^2) = BC^2.$$

3

(SPACE FOR ROUGH WORK)



35. Prove that

$$(\sin \theta + \operatorname{cosec} \theta)^2 + (\cos \theta + \sec \theta)^2 = 7 + \tan^2 \theta + \cot^2 \theta.$$

OR

Prove that $\sqrt{\frac{1 + \cos \theta}{1 - \cos \theta}} = \operatorname{cosec} \theta + \cot \theta.$ 3

36. Prove that the tangents drawn to a circle from an external point are equal. 3

V. 37. The product of three consecutive terms of a geometric progression is 216 and the sum of their products taken in pairs is 156. Find the terms of the progression.

OR

Find three consecutive terms in an Arithmetic progression whose sum is 18 and sum of their squares is 140. 4

38. Draw a transverse common tangent to two circles of radii 4 cm and 2 cm whose centres are 9 cm apart. Measure the length of the tangent. 4

39. Prove that "If two triangles are equiangular, then their corresponding sides are proportional". 4

40. Solve the quadratic equation $x^2 + x - 6 = 0$ graphically. 4

graph

(SPACE FOR ROUGH WORK)

