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SL. No. : E

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 50]

Total No. of Questions : 50]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E****CCE PR
UNREVISED**

[ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12

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ಇಲ್ಲಿಂದ ಕತ್ತರಿಸಿ

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

(ಹಳೆ ಪಠ್ಯಕ್ರಮ / Old Syllabus)

(ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Repeater)

ದಿನಾಂಕ : 21. 06. 2019]

[Date : 21. 06. 2019

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 9-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ-12-45 ರವರೆಗೆ] [Time : 9-30 A.M. to 12-45 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 100]

[Max. Marks : 100

General Instructions to the Candidate :

1. This Question Paper consists of 50 objective and subjective types of questions.
2. This question paper has been sealed by reverse jacket. You have to cut on the right side to open the paper at the time of commencement of the examination. Check whether all the pages of the question paper are intact.
3. Follow the instructions given against both the objective and subjective types of questions.
4. Figures in the right hand margin indicate maximum marks for the questions.
5. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.

TEAR HERE TO OPEN THE QUESTION PAPER

ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯಲು ಇಲ್ಲಿ ಕತ್ತರಿಸಿ

Tear here



* (21)1302-PR(D)

[Turn over

- 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 of alphabet.

$$8 \times 1 = 8$$

1. If A and B are two non-empty subsets of a universal set, then De-Morgan's law is given by

(A) $(A \cup B)^c = A^c \cup B^c$

(B) $(A \cup B)^c = A^c \cap B^c$

(C) $(A \cap B)^c = A^c \cap B^c$

(D) $(A \cup B)^c = (A \cap B)^c$

2. The value of ${}^nC_0 \times {}^nC_1$ is

(A) 1

(B) n

(C) $n!$

(D) 0

3. A fair die, the faces of which are numbered from 1 to 6 is rolled once. The probability of getting 4 on its top face is

(A) $\frac{4}{6}$

(B) $\frac{3}{6}$

(C) $\frac{2}{6}$

(D) $\frac{1}{6}$

4. If the mean of a collection of data is 13 and standard deviation is 5.2 then the coefficient of variation of the same data is

(A) 20

(B) 30

(C) 40

(D) 50



5. A quadratic equation whose roots are $3 + 2\sqrt{5}$ and $3 - 2\sqrt{5}$ is
- (A) $x^2 - 6x - 11 = 0$ (B) $x^2 + 6x - 11 = 0$
(C) $x^2 + 6x + 11 = 0$ (D) $x^2 - 11x + 6 = 0$
6. If $\tan A = \frac{3}{4}$ then $\sin A$ is
- (A) $\frac{3}{5}$ (B) $\frac{4}{3}$
(C) $\frac{4}{5}$ (D) $\frac{5}{3}$
7. The distance between the origin and point (x, y) is
- (A) $\sqrt{x^2 - y^2}$ (B) $\sqrt{(x + y)^2}$
(C) $\sqrt{(x - y)^2}$ (D) $\sqrt{x^2 + y^2}$
8. If P is the mid-point of the line joining $A(1, 4)$ and $B(3, 6)$ then the co-ordinates of P is
- (A) $(4, 10)$ (B) $(2, 10)$
(C) $(2, 5)$ (D) $(4, 5)$

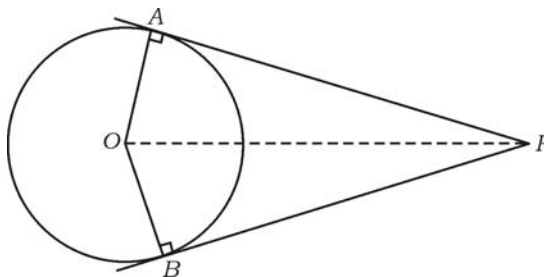
II. Answer the following :

$6 \times 1 = 6$

9. Write the formula to find the Harmonic mean between two positive integers a and b .
10. State Euclid's Division Lemma.
11. Write the nature of the roots of a quadratic equation whose discriminant is 0 [i.e. $\Delta = 0$].



12. In the figure, PA and PB are the tangents to the circle with centre O and $\angle APB = 80^\circ$. Find $\angle AOP$.



13. If the length of the diagonal of a square is $10\sqrt{2}$ cm, find the length of the side.
14. Write the formula to find the volume of the sphere whose radius is r units.

III. Answer the following :

15. If $A = \{1, 2, 7\}$ and $B = \{5, 7, 12\}$ are two sets then verify
 $A \cup B = B \cup A$. 2
16. Define Arithmetic progression. Write the general form of arithmetic progression. 2
17. In a Harmonic progression 5th term is $\frac{1}{12}$ and 11th term is $\frac{1}{15}$. Then find the 25th term. 2
18. Prove that $5 - \sqrt{3}$ is an irrational number. 2
19. Find, how many three-digit even numbers can be formed using the digits 3, 5, 7, 8 and 9, without repeating any digit. 2



20. There are eight teachers in a school, including headmaster. Find in how many ways, can a committee of 5 members be formed so as to include headmaster in the committee. 2
21. 500 lottery tickets are sold. Of these 5 tickets are allotted prizes. Sanjay purchased one lottery ticket. What is the probability that Sanjay gets lottery prize ? 2
22. Find the sum of $2\sqrt{a}$, $7\sqrt{a}$, $-3\sqrt{a}$. 2
23. Rationalise the denominator and simplify $\frac{2}{\sqrt{5}-\sqrt{3}}$. 2
24. Find the remainder obtained when $P(x) = x^3 + 3x^2 - 5x + 8$ is divided by $g(x) = (x - 1)$. 2
25. Divide $3x^3 + 11x^2 + 34x + 106$ by $(x - 3)$, using synthetic division and find the quotient and remainder. 2

OR

If $(x - 5)$ is a factor of $x^3 - 3x^2 + ax - 10$, then find the value of a .

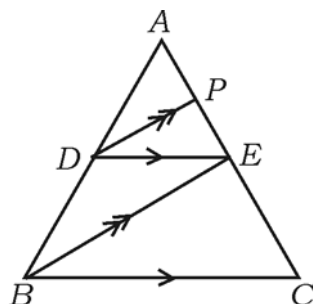
26. Draw a chord AB of length 5 cm in a circle of radius 3 cm. Construct a tangent at the point B . 2



27. In the figure if $DE \parallel BC$ and $DP \parallel BE$ then prove that

$$AE^2 = AP \cdot AC.$$

2



OR

If the areas of two similar triangles are equal, then prove that they are congruent.

28. If $A = 60^\circ$, $B = 30^\circ$ then prove that

$$\cos (A + B) = \cos A \cdot \cos B - \sin A \cdot \sin B.$$

2

29. The distance between the points $(3, 1)$ and $(0, x)$ is 5 units. Find x .

2

30. Draw a plan using following information :

2

(Scale 20 m = 1 cm)

	To D (in metres)	
To E 60	200	60 to C 30 to B
	140	
	120	
	40	
	From A	

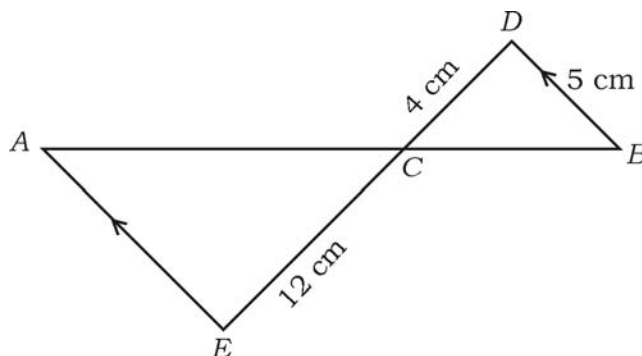


31. If A and B are subsets of universal set, draw the Venn diagram to represent $(A \cup B)^c$. Consider A and B as non-disjoint sets. 2
32. Find the sum of $1 + 2 + 4 + \dots$ up to 10 terms. 2
33. Using Euclid's division algorithm, find the HCF of 45 and 60. 2
34. The following table shows how the students come to school. Draw a pie chart to represent the data : 2

Walk	Bicycle	Bus	School Van
12	8	6	10

35. If $f(x) = 2x^3 + 3x^2 + 8x - 5$ then find the values of
 i) $f(0)$ ii) $f(1)$. 2
36. Solve the equation using formula : 2
- $$x^2 - 3x + 2 = 0.$$

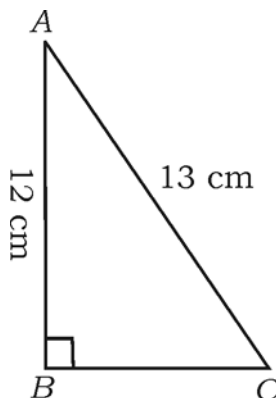
37. In the given figure, $AE \parallel DB$, $DC = 4$ cm, $CE = 12$ cm and $BD = 5$ cm. Find the length of AE . 2



38. In right angled triangle ABC , $\angle B = 90^\circ$, $AB = 12$ cm and $AC = 13$ cm.

Find BC .

2



39. Find the value of $\frac{\sin 36^\circ}{\cos 54^\circ} - \frac{\sin 54^\circ}{\cos 36^\circ}$.

2

40. Find the distance between the points $(2, 3)$ and $(6, 6)$, using formula.

2

IV. Answer the following :

41. Find three positive integers in Arithmetic progression such that their sum is 24 and product is 480.

3

OR

If the 4th and 8th terms of a Geometric progression are 24 and 384 respectively, find the first term and common ratio.

42. Calculate the standard deviation of the following scores :

3

2, 4, 6, 8, 10.

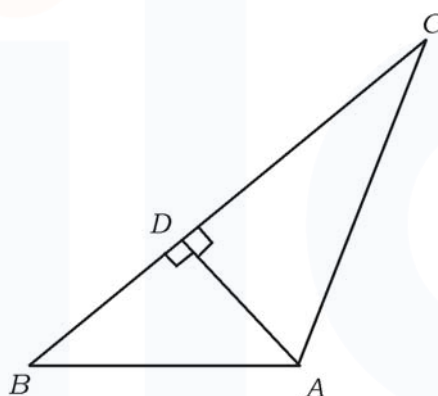


43. If one root of the quadratic equation $x^2 - 6x + q = 0$ is twice the other, find the value of q . 3

OR

If m and n are the roots of equation $x^2 - 3x + 1 = 0$, find the value of

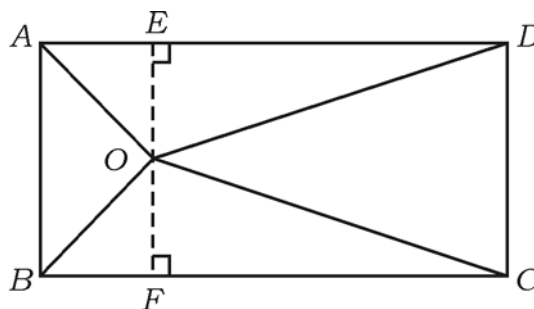
- i) $m^2n + mn^2$
 ii) $\frac{1}{m} + \frac{1}{n}$.
44. Prove that “if two circles touch each other externally, the centres and the point of contact are collinear”. 3
45. In the figure if $AD \perp BC$, prove that $AB^2 + CD^2 = BD^2 + AC^2$. 3



OR

In the figure, O is any point inside a rectangle $ABCD$. Prove that

$$OB^2 + OD^2 = OA^2 + OC^2.$$

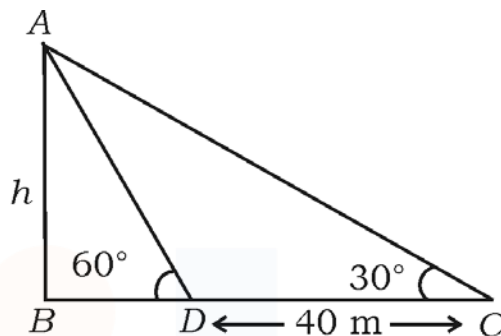


46. Prove that $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$.

3

OR

The shadow of a tower when sun's altitude is 30° is 40 m longer than its shadow when the sun's altitude was 60° . Find the height of the tower.



V. Answer the following :

47. Solve graphically : $x^2 + x - 2 = 0$.

4

48. Construct a direct common tangent to two circles of radii 4 cm and 2 cm whose centres are 8 cm apart.

4

49. Prove that, "the areas of similar triangles are proportional to the squares of their corresponding sides".

4

50. A 20 m deep well with diameter 7 m is dug and the mud from digging is evenly spread out to form a platform of cuboid shape, of length 22 m and breadth 14 m. Find the height of the platform.

4

OR



A cylindrical vessel of height 32 cm and base radius 18 cm is completely filled with sand. Then the sand in the vessel is poured on the plane ground to form a conical heap of sand of height 24 cm. Find the base radius of conical heap of sand.



