

ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12 ]

Total No. of Printed Pages : 12 ]

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 50 ]

Total No. of Questions : 50 ]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : **81-E**

**D**

**CCE PR  
UNREVISED**

Question Paper Serial No. **50**

ಸರಿಪಡಿಸಿದ ಕಡಲಿನಲ್ಲಿ

ವಿಷಯ : ಗಣಿತ

**Subject : MATHEMATICS**

( ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version )

( ಹಳೆ ಪಠ್ಯಕ್ರಮ / Old Syllabus )

( ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Repeater )

ದಿನಾಂಕ : 07. 04. 2020 ]

[ Date : 07. 04. 2020

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



- 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 the subsets of an Universal set then the De Morgan's law among the following is 

(A)  $(A \cup B)' = A' \cap B'$

(B)  $(A \cup B)' = A' \cup B'$

(C)  $(A \cap B)' = A' \cap B'$

(D)  $(A \cap B)' = A \cup B.$



2. The formula used to find the Geometric Mean ( $G$ ) of  $a$  and  $b$  is 

(A)  $G = \frac{a+b}{2}$

(B)  $G = \sqrt{ab}$

(C)  $G = \frac{a-b}{2}$

(D)  $G = ab.$



3. The LCM of 8 and 12 is 24, then their HCF is

(A) 4

(B) 24

(C) 8

(D) 12.



4. If  $P(x) = x^2 - 4$  then the value of  $P(2)$  is

(A) 8

(B) 4

(C) 0

(D) 2.



5. The discriminant of the quadratic equation  $ax^2 + bx + c = 0$  is

(A)  $b^2 + 4ac$

(B)  $b^2 - 4ac$

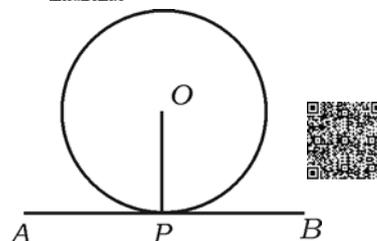
(C)  $\sqrt{b^2 - 4ac}$

(D)  $\sqrt{b^2 + 4ac}.$





6. In the adjoining figure,  $AB$  is a tangent to the circle.  $P$  is the point of contact then  $\angle OPA$  is



- (A)  $60^\circ$  (B)  $0^\circ$   
 (C)  $180^\circ$  (D)  $90^\circ$ .

7. The value of  $\sin 30^\circ$  is

- (A) 1 (B)  $\sqrt{3}$   
 (C)  $\frac{1}{2}$  (D)  $\sqrt{2}$ .

8. Which of the following measures represent the sides of a right angled triangle ?

- (A) 6, 8, 9 (B) 3, 4, 6  
 (C) 7, 8, 9 (D) 6, 8, 10.

II. Answer the following questions :

$6 \times 1 = 6$

9. Find the 10th term of the sequence  $T_n = 2n - 5$ .

10. Find the value of  ${}^n P_0 + {}^n C_0$ .

11. Write the probability of an "impossible event".



12. Write the formula used to find the coefficient of variation of certain scores.



13. Write the degree of the polynomial  $p(x) = 4x^3 + 5x^2 - 6x + 8$ .

14. Find the sum of the roots of the quadratic equation  $x^2 - 6x + 5 = 0$ .



III. Answer the following questions :



15. In a class, 50 students offered Mathematics subject, 42 offered Science subject and 24 offered both the subjects. Every student of the class should select at least one subject. Find the number of students of the class. 2

16. Find the 20th term of the progression  $\frac{1}{2}, \frac{1}{4}, \frac{1}{6}, \dots$ .



2

17. Prove that  $2 + \sqrt{3}$  is an irrational number.



2

18. Find the maximum number of diagonals that can be drawn in a decagon using the formula.



2

19. If  $(n + 3)! = 20(n + 1)!$  find the value of  $n$ .



2

20. A die whose faces are numbered from 1 to 6 is rolled once, find the probability of getting

a) an even number



b) a square number.

2

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



2



22. Simplify :  $3\sqrt{\frac{1}{2}} + \frac{1}{3}\sqrt{18}$ .



2

23. Find the quotient and the remainder using synthetic division.



$$3x^3 - 2x^2 + 7x - 5 \div (x - 3).$$



2

OR

Find the zeroes of the polynomial  $p(x) = x^2 - 2x - 15$ .



24. Draw a circle of radius 4 cm and construct tangents to it from a point 8 cm away from the centre.



2

25. The angle of elevation of the top of a vertical tower from a point on the level ground which is 50 m from the foot of the tower is  $30^\circ$ . Find the height of the tower.

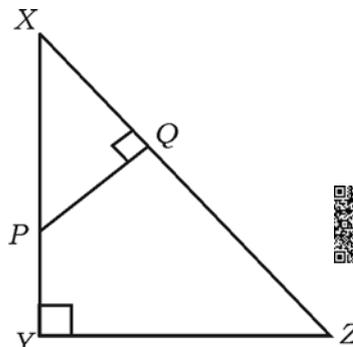


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26. In  $\triangle XYZ$ ,  $P$  is any point on  $XY$  and  $PQ \perp XZ$ . If  $XP = 4$  cm,  $XY = 16$  cm and  $XZ = 24$  cm, find  $XQ$ .



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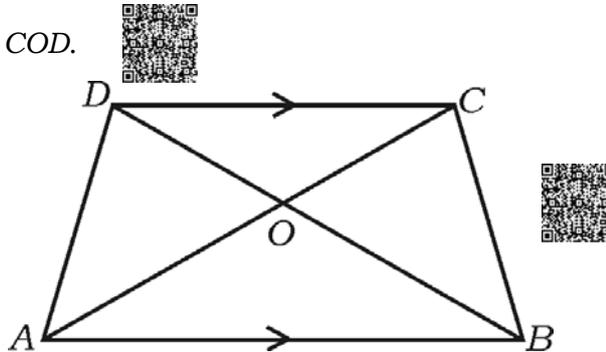


OR





In the trapezium  $ABCD$ ,  $AB \parallel CD$  and  $AB = 3 CD$ . Find the ratio of areas of  $\Delta AOB$  and  $\Delta COD$ .



27. Find the coordinates of the mid-point of the line segment joining the points  $(2, 3)$  and  $(4, 7)$ .

28. Find the values of  $y$  for which the distance between the points  $P(2, -3)$  and  $Q(10, y)$  is 10 units.

29. Find the total surface area of a right circular cylinder whose height and radius of base are 20 cm and 7 cm respectively.

30. Draw a plan of a level ground using the information given below :  
(Scale 20 m = 1 cm)

	Metre to D	
To E 100	160	80 to C
	100	
	60	
	40	
	From A	



31. Draw Venn diagrams to illustrate the following :

i)  $A \cup B$



ii)  $A \setminus B$ .

2

32. If  $T_n = n^3 - 1$  and  $T_n = 26$  then find the value of  $n$ .



2

33. Rationalise the denominator and simplify :



2

$$\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$$



34. The survey carried out in the class regarding places of visit for excursion and the number of students who opted each place is given below. Draw a

pie chart to represent the data :



2

Places	Mysuru	Vijayapura	Gokarna	Chitradurga
No. of students	14	6	2	18

35. Find the value of  $a$ , if  $(x - a)$  is a factor of  $(x^3 - a^2x + x + 2)$ .



2

36. Reduce the equation  $x^2 + 3 = 2x$  in the standard form  $ax^2 + bx + c = 0$

and write the values of  $a$ ,  $b$  and  $c$ .



2

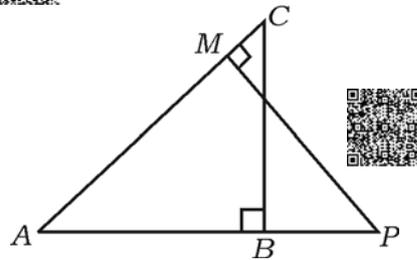


37. In the given figure  $\triangle ABC$  and  $\triangle AMP$  are two right angled triangles. Prove

that  $\frac{CA}{PA} = \frac{BC}{MP}$ .



2



38. The sides of a right angled triangle containing the right angle are 5 cm and

12 cm. Find its hypotenuse.



2

39. If  $\tan 2A = \cot (A - 18^\circ)$ , where  $2A$  is an acute angle, then find the value

of  $A$ .



2

40. Determine the slope of the line joining the points  $(3, 4)$  and  $(7, 8)$ .

2



IV. Answer the following questions :

41. Calculate standard deviation for the following frequency distribution

table :



3

<i>C.I.</i>	<i>f</i>
1 — 5	4
6 — 10	3
11 — 15	2
16 — 20	1
	$n = 10$





42. Prove that if two circles touch each other externally, “their centres and the point of contact are collinear”.  3

43. Solve by using formula :  3  

$$x(x + 1) = 6x + 24.$$

OR

If  $m$  and  $n$  are the roots of the equation  $x^2 - 7x + 12 = 0$ , find the values of

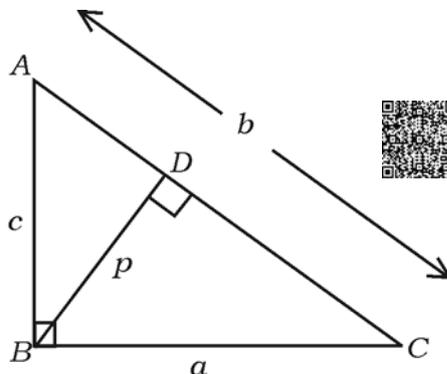
a)  $(m + n)mn$  

b)  $\frac{1}{m} + \frac{1}{n}$ .

44. In an equilateral triangle  $ABC$ ,  $D$  is a point on side  $BC$  such that   
 $BD = \frac{1}{3} BC$ . Prove that  $9AD^2 = 7AB^2$ .  3

OR

In  $\triangle ABC$ ,  $\angle ABC = 90^\circ$ ,  $BD \perp AC$ . If  $AB = c$  units,  $BC = a$  units,  $BD = p$  units,  $CA = b$  units. prove that  $\frac{1}{a^2} + \frac{1}{c^2} = \frac{1}{p^2}$ . 



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



3

OR

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



46. The internal and external diameters of an empty hemispherical metallic bowl are 6 cm and 10 cm respectively. It is melted and recast into a solid cone of base diameter 14 cm. Find the height of the cone so formed.

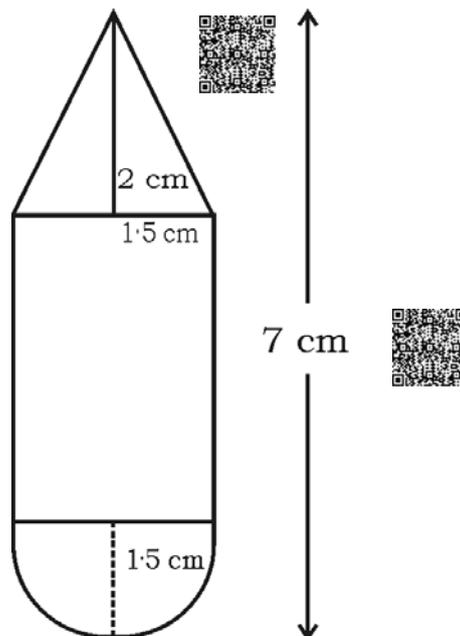


3

OR



A wooden toy is in the shape of a cylinder with a cone attached to one end and a hemisphere attached to the other end as shown in the figure. All of them are of the same radius of 1.5 cm. The total length of the toy is 7 cm and height of cone is 2 cm. Calculate the volume of the toy.



V. Answer the following questions :



47. The sum of the 4th and 8th terms of an A.P. is 24 and the sum of the 6th and 10th terms of it is 44. Find the first three terms of the A.P.  4

OR

The 4th term of a G.P. is 24 and its 8th term is 384, find the sum of the first 10 terms. 

48. Construct two direct common tangents to two circles of radii 4 cm and 2 cm whose centres are 9 cm apart.  4
49. Prove that, “if a straight line is drawn parallel to a side of a triangle, then it divides the other two sides proportionally”.  4
50. Solve graphically :  $x^2 - x - 6 = 0$ .  4

