

SL. No. : AA

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 50 ]

Total No. of Questions : 50 ]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

**CCE PF**  
**CCE PR**

[ ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12

[ Total No. of Printed Pages : 12

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ಇಲ್ಲಿಂದ ಕತ್ತರಿಸಿ

ವಿಷಯ : ಗಣಿತ

**Subject : MATHEMATICS**

( ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version )

( ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus )

(ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ + ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Fresh + Private Repeater)

ದಿನಾಂಕ : 03. 04. 2017 ]

[ Date : 03. 04. 2017

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

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**PF+PR-III-512**

[ 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 polynomial  $p(x) = x^2 - 4$  is divided by a linear polynomial  $(x - 2)$  then the remainder is
  - (A) 2
  - (B) -2
  - (C) 0
  - (D) -8.
  
2. The sum and product of the roots of the equation  $x^2 + 2x + 1 = 0$  are respectively,
  - (A) 2 and -1
  - (B) -2 and 1
  - (C) -2 and -1
  - (D) 1 and 2.
  
3. In a circle the angle between a radius and a tangent at non-centre end of the radius is
  - (A)  $90^\circ$
  - (B)  $180^\circ$
  - (C)  $45^\circ$
  - (D)  $360^\circ$ .

4. The volume of a right circular cylinder whose circular base area is 154 sq.cm and height 10 cm is
- (A) 15·40 c.c.  
(B) 15400 c.c.  
(C) 1·540 c.c.  
(D) 1540 c.c.
5. If  $\tan \theta = \frac{1}{\sqrt{3}}$  and  $\cos \theta = \frac{\sqrt{3}}{2}$  then the value of  $\sin \theta$  is
- (A)  $\sqrt{3}$   
(B)  $\frac{1}{2}$   
(C)  $\frac{2}{\sqrt{3}}$   
(D)  $\frac{3}{2}$ .
6.  $(7 \times 11 \times 13 + 13)$  is a / an
- (A) Composite number  
(B) Prime number  
(C) Irrational number  
(D) Imaginary number.

7. The sum of an infinite geometric series whose first term is  $a$  and common ratio is  $r$  is given by

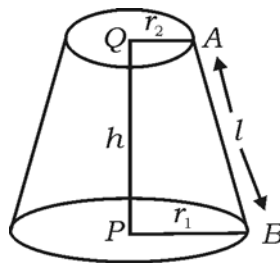
(A)  $S_{\infty} = \frac{1}{a-r}$

(B)  $S_{\infty} = \frac{1}{r-a}$

(C)  $S_{\infty} = \frac{a}{1-r}$

(D)  $S_{\infty} = \frac{1-r}{a}$  .

8. Lateral surface area of the frustum of a cone is



(A)  $\pi(r_2 - r_1)h$

(B)  $\pi(r_1 + r_2)h$

(C)  $\pi(r_1 - r_2)l$

(D)  $\pi(r_1 + r_2)l$ .

II. Answer the following :

$6 \times 1 = 6$

9. If  $U = \{1, 2, 3, 4, 5, 6\}$  and  $A = \{2, 3, 4, 5\}$  then find  $A'$ .
10. Write the relation between standard deviation of a set of scores and its variance.

11. In a sequence if  $T_n = n^2 + 4$  then find  $T_2$ .
12. A fair coin is tossed once. Find the probability that head occurs.
13. State Pythagoras theorem.
14. Write the general form of a quadratic polynomial.
- III. 15. Given  $A = \{1, 2, 3, 4\}$ ,  $B = \{3, 4, 5, 6\}$  and  $C = \{6, 7\}$ . Verify that  
 $(A \cap B) \cap C = A \cap (B \cap C)$ . 2
16. Arithmetic mean between two numbers is 5 and Geometric mean between them is 4. Find the Harmonic mean between the numbers. 2

OR

In a harmonic progression third term and fifth terms are respectively 1 and  $\frac{1}{-5}$ . Find the tenth term.

17. Prove that  $5 - \sqrt{3}$  is an irrational number. 2
18. Find the value of  $n$  if  ${}^n P_4 = 5({}^n P_3)$ . 2
19. If  $A$  is an event in a random experiment such that  $P(A) : P(\bar{A}) = 5 : 11$ , then find  $P(A)$  and  $P(\bar{A})$ . 2
20. What are like surds and unlike surds ? Identify and write the set of like surds in the following groups : 2
- a)  $\{\sqrt{8}, \sqrt{12}, \sqrt{20}, \sqrt{54}\}$
- b)  $\{\sqrt{50}, \sqrt[3]{54}, \sqrt[4]{32}\}$
- c)  $\{\sqrt{8}, \sqrt{18}, \sqrt{32}, \sqrt{50}\}$ .

21. Rationalise the denominator and simplify : 2

$$\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}}.$$

22. A polynomial  $p(x)$  is divided by  $(2x - 1)$ . The quotient and remainder obtained are  $(7x^2 + x + 5)$  and 4 respectively. Find  $p(x)$ . 2

OR

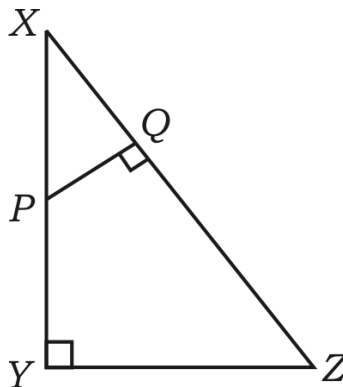
Find the quotient and remainder using synthetic division.

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

23. Area of an equilateral triangle is given by  $A = \frac{\sqrt{3} a^2}{4}$  where  $A$  is the area and  $a$  is the side. Find the perimeter of the triangle if  $A = 16\sqrt{3}$  sq.cm. 2

24. Show that the roots of the equation  $x^2 - 2x + 3 = 0$  are imaginary. 2

25. 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  $XQ$ . 2



26. Show that  $\frac{1 - \tan^2 A}{1 + \tan^2 A} = 2 \cos^2 A - 1$ . 2

27. Find the slope of the line joining the points  $(4, -8)$  and  $(5, -2)$ . 2

28. Find the co-ordinates of the mid-point of the line joining the points ( 2, 3 ) and ( 4, 7 ). 2

29. Draw a plan of a level ground using the information given below :

[ Scale : 20 metres = 1 cm ]

|         |                    |         |
|---------|--------------------|---------|
|         | To D ( in metres ) |         |
|         | 150                |         |
|         | 100                | 70 to C |
| 80 to E | 80                 |         |
|         | 30                 | 40 to B |
|         | From A             |         |

2

30. Draw a circle of radius 3.5 cm and construct a chord of length 6 cm in it. Measure and write the distance between the centre and the chord. 2

31. A, B and C are the sets having some common elements in them. Draw Venn diagram to illustrate  $(A \cup B) \cup C$ . 2

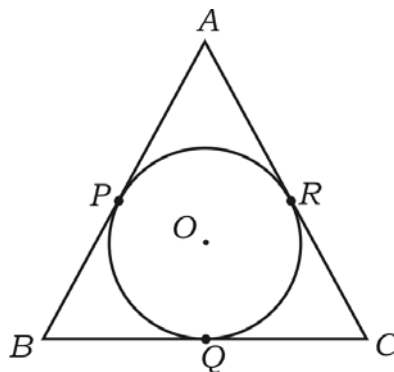
32. Find the sum of the series  $1 + 2 + 4 + \dots$  up to 10 terms. 2

33. A survey which was conducted to study the various brands of soaps used by some people in a village is given below. Draw pie chart to represent the data. 2

|                           |    |    |    |
|---------------------------|----|----|----|
| <i>Brand of soap</i>      | A  | B  | C  |
| <i>No. of people used</i> | 12 | 08 | 04 |

34. Simplify :  $\sqrt{18} + \sqrt{128} - \sqrt{50}$ . 2
35. If  ${}^5C_r = 10$  and  ${}^5P_r = 60$  then find the value of  $r$ . 2

36. Solve the equation  $x^2 - 7x + 12 = 0$  by using formula. 2
37. The corresponding altitudes of two similar triangles are 3 cm and 5 cm respectively. Find the ratio between their areas. 2
38. Find the remainder when  $P(x)$  is divided by
- i)  $(x - a)$
- ii)  $(x + a)$ . 2
39. The height of a right circular cone is 4 cm and radius of its circular base is  $\frac{21}{2}$  cm. Find the volume of it. 2
40. In the figure  $AB$ ,  $BC$  and  $AC$  are the tangents to circle of centre  $O$ . If  $AB = AC$ , show that  $BQ = CQ$ . 2



- IV. 41. Everybody in a function shakes hand with everybody else. The total number of handshakes are 45. Find the number of persons in the function. 3

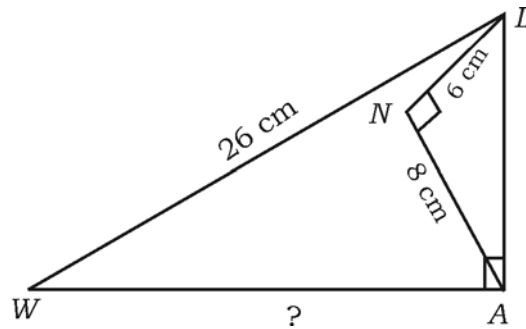
OR

Show that the number of diagonals in a polygon of  $n$  sides is  $\frac{n(n-3)}{2}$ .

42. Calculate the coefficient of variation (C.V.) of the following data : 3
- 40, 36, 64, 48, 52.

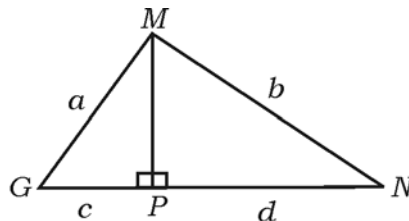


43. If two circles touch each other externally, prove that the centres and the point of contact are collinear. 3
44. In  $\triangle LAW$ ,  $\angle LAW = 90^\circ$ ,  $\angle LNA = 90^\circ$ ,  $LW = 26$  cm,  $LN = 6$  cm and  $AN = 8$  cm. Calculate the length of  $WA$ . 3

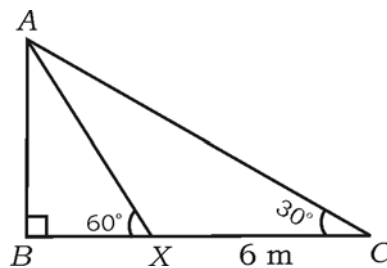


OR

In  $\triangle MGN$ ,  $MP \perp GN$ . If  $MG = a$  units,  $MN = b$  units,  $GP = c$  units and  $PN = d$  units, prove that  $\frac{(a - b)}{(c - d)} = \frac{(c + d)}{(a + b)}$ .



45. The angle of elevation of the top of a flag post ( $AB$ ) from a point ( $C$ ) on a horizontal ground is found to be  $30^\circ$ . On walking 6 m towards the post at  $X$ , the angle of elevation is found to be  $60^\circ$  as shown in the figure. Find the height of the flag post. 3



OR

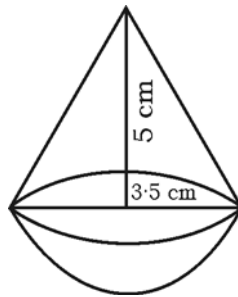
Prove that

$$\frac{\sin(90^\circ - \theta)}{\operatorname{cosec}(90^\circ - \theta) - \cot(90^\circ - \theta)} = 1 + \sin \theta.$$

46. A toy is in the form of a cone mounted on a hemisphere as shown in the figure. If the radius of each of these solids is  $\frac{7}{2}$  cm and height of the cone

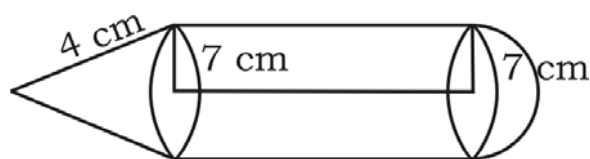
is 5 cm, find the volume of the toy.

3



OR

A solid is composed of a cylinder with a hemisphere at one end and a cone at other end as shown in the figure. If the radius of each of these solids is 7 cm and height of the cylinder is equal to slant height of the cone, find the total surface area of the solid if slant height is 4 cm.



- V. 47. Construct two circles of radii 4 cm and 2 cm whose centres are 8 cm apart. Construct a transverse common tangent. Measure and write its length. 4
48. State and prove Basic proportionality (Thales) theorem. 4

49. The third term of a geometric progression is square of its first term and the fifth term of it is 64. Find the sum of the first six terms of the Geometric Progression. 4

OR

The fourth term of an Arithmetic Progression is 10 and the eleventh term of it exceeds three times the fourth term by 1. Find the sum of the first 20 terms of the progression.

50. Solve the quadratic equation  $x^2 - x - 2 = 0$  graphically. 4
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