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SL. No. : P

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 50]
Total No. of Questions : 50]

[ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12
[Total No. of Printed Pages : 12

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ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : 81-E

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

(ಹಳೆ ಪಠ್ಯಕ್ರಮ / Old Syllabus)

(ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Repeater)

ದಿನಾಂಕ : 25. 03. 2019]

[Date : 25. 03. 2019

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

ಗರಿಷ್ಠ ಅಂಕಗಳು : 100]

[Max. Marks : 100

TEAR HERE TO OPEN THE QUESTION PAPER
ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯಲು ಇಲ್ಲಿ ಹರಿಯಿರಿ

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

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 $A = \{ 4,\ 8,\ 12,\ 16,\ 20,\ 24 \}$ and $B = \{ 4,\ 20,\ 28 \}$ then $A \cap B$ is

   (A) $\{ 4,\ 8,\ 12,\ 16,\ 20,\ 24,\ 28 \}$

   (B) $\{ 4,\ 20 \}$

   (C) $\{ 28 \}$

   (D) $\{ \}$

2. The sum to infinite terms of a Geometric progression whose first term is a and common ratio r is given by the formula.

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

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

3. If H and L are the HCF and LCM of two numbers A and B respectively then

   (A) $A \times H = L \times B$ (B) $A \times B = L \times H$

   (C) $A + B = L + H$ (D) $A + B = L - H$

4. The degree of the polynomial $P(x) = 2x^3 + 3x^2 - 11x + 6$ is

   (A) 2 (B) 6

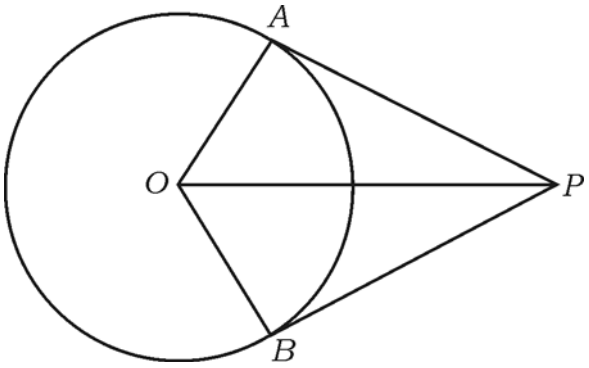
   (C) 3 (D) 4

5. The standard form of a quadratic equation is

   (A) $ax^2 = 0$ (B) $ax^2 + bx = 0$

   (C) $ax^2 + c = 0$ (D) $ax^2 + bx + c = 0$

6. In the given figure, $\overline{PA}$ and $\overline{PB}$ are the tangents to the circle with centre O. If $\angle AOB = 100°$, then $\angle APO$ is



(A) 50° (B) 80°

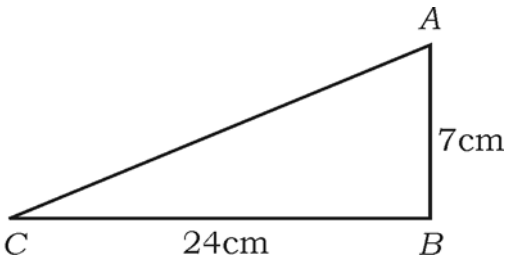
(C) 90° (D) 40°

7. The value of $\tan^2 60° + 2 \tan^2 45°$ is

(A) 5 (B) $\sqrt{3}+1$

(C) 4 (D) $\sqrt{3}+2$

8. In $\triangle ABC$ right angled at B, $\overline{AB}$ = 7 cm, $\overline{BC}$ = 24 cm. Then length of $\overline{AC}$ is



(A) 30 cm (B) 17 cm

(C) 25 cm (D) 19 cm

II. Answer the following questions : $6 \times 1 = 6$

9. Find the arithmetic mean of 16 and 20.

10. Find the value of ${}^{5}P_{3}$.

11. The probability of winning a game is 0·8. What is the probability of losing the same game ?

12. The Mean ($\bar{x}$) of certain scores is 60 and the standard deviation (σ) of the same scores is 3. Find the coefficient of variation of the scores.

13. Find the remainder obtained when $P(x) = 4x^2 - 7x + 9$ is divided by $(x - 2)$.

14. Write the discriminant of the quadratic equation $ax^2 + c = 0$.

III. Answer the following questions :

15. In a group of 60 people, 40 people like to read newspapers, 35 people like to read magazines and 26 people like to read both. Find the number of people who read neither newspapers nor magazines. 2

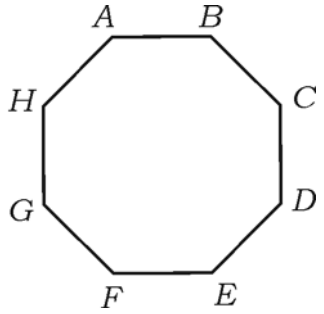
16. Find the tenth term of the progression $\frac{1}{5}, \frac{1}{3}, 1, -1, \ldots$. 2

17. Prove that $3 + \sqrt{5}$ is an irrational number. 2

18. a) State the fundamental principle of counting.

b) Write the value of 0 ! 2

19. Using a suitable formula calculate the number of diagonals that can be drawn in the given polygon. 2



20. In an experiment of tossing a fair coin twice, find the probability of getting

a) two heads

b) exactly one tail. 2

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

22. Rationalise the denominator and simplify : 2

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

23. Find the quotient and the remainder using synthetic division : 2

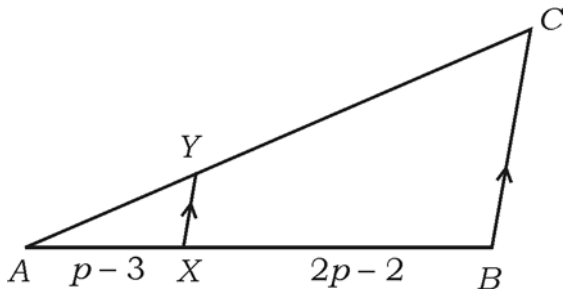
$(x^3 + x^2 - 3x + 5) \div (x - 1)$.

OR

If one of the zeros of the polynomial $x^2 - x - (2k + 2)$ is -4, find the value of k.

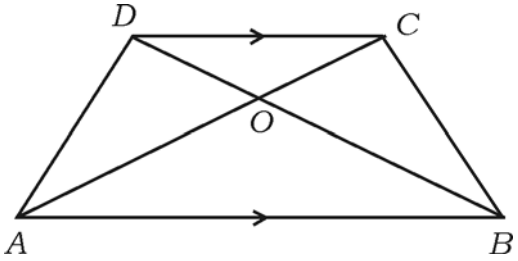
24. Draw a circle of radius 4 cm and construct a tangent at one end of its diameter. 2

25. In the following figure, $\overline{AX} = p - 3$, $\overline{BX} = 2p - 2$, $\frac{AY}{YC} = \frac{1}{4}$. Find p. 2



OR

In the trapezium $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\overline{AB} = 2\overline{CD}$ and area of ΔAOB is 84 cm^2. Find the area of ΔCOD.



26. Given $\tan A = \frac{3}{4}$, find $\sin A$ and $\cos A$. 2

27. Find the equation of a line having angle of inclination 45° and y-intercept is 2. 2

28. Find the distance between the points $A(6, 5)$ and $B(4, 4)$. 2

29. The curved surface area of a right circular cone is 4070 cm^2 and its slant height is 37 cm. Find the radius of the base of the cone. 2

30. Draw a plan of a level ground using the information given below : 2

(Scale 20 m = 1 cm)

	Metre To C	
To D 100 To E 60	220 160 120 80	80 to B
	From A	

31. Given $U = \{ 5, 6, 8, 10, 12, 14, 16, 18 \}$, $A = \{ 5, 6, 8, 10 \}$ and $B = \{ 6, 8, 12, 14 \}$. Represent $(A \cup B)'$ by a Venn diagram. 2

32. If $T_n = n^2 + 4$ and $T_n = 200$, find the value of n. 2

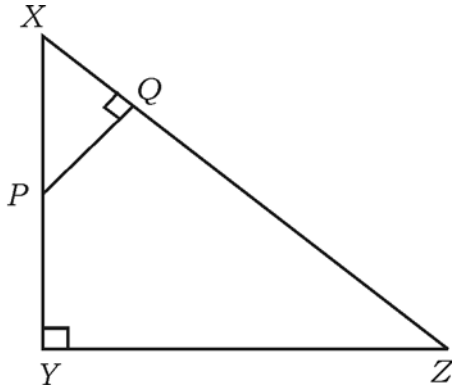
33. Find the sum of $\left(4\sqrt{x} + 6\sqrt{y} \right)$ and $\left(5\sqrt{x} - 3\sqrt{y} \right)$. 2

34. The number of students who are willing to join their favourite sports is given below. Draw a pie chart to represent the data : 2

Name of the sport	*Number of students*
Hockey	3
Football	6
Tennis	5
Basket Ball	4

35. Find the zeros of the polynomial $p (x) = x^2 + 14x + 48$. 2

36. In $\triangle XYZ$, P is a point on $\overline{XY}$ as shown in the figure. If $\overline{PQ} \perp \overline{XZ}$, $\overline{XP}$ = 4 cm, $\overline{XY}$ = 16 cm and $\overline{XZ}$ = 24 cm, find the length of $\overline{XQ}$. 2



37. Find the length of the diagonal of a square of side 12 cm. 2

38. Form the quadratic equation whose roots are 3 and 5. 2

39. Find the co-ordinates of the mid-point of the line joining the points (5, 6) and (– 3, 8). 2

40. If $\tan 2A = \cot (A - 18°)$, where $2A$ is an acute angle, then find the value of A. 2

IV. Answer the following questions :

41. Prove that the tangents drawn from an external point to a circle

a) are equal

b) subtend equal angles at the centre

c) are equally inclined to the line joining the centre and the external point. 3

42. The circumference of the circular base of a right cylindrical vessel is 132 cm and its height is 25 cm. Calculate the maximum quantity of water it can hold. (Use $\pi = \frac{22}{7}$). 3

OR

A solid metallic right circular cone is of height 20 cm and its base radius is 5 cm. This cone is melted and recast into a solid sphere. Find the radius of the sphere. (Use $\pi = \frac{22}{7}$).

43. Find the standard deviation for the following data : 3

Marks (x)	*Number of students (f)*
35	2
40	4
45	8
50	4
55	2

44. A building and a tower are on the same level ground. The angle of elevation of the top of the building from the foot of the tower is 30°. The angle of elevation of the top of the tower from the foot of the building is 60°. If the height of the tower is 50 m, then find the height of the building. 3

OR

Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$.

45. Solve by using formula : 3

$x^2 - 2x + 3 = 3x + 1.$

OR

If m and n are the roots of the quadratic equation $x^2 - 6x + 2 = 0$, then find the value of

a) $\frac{1}{m} + \frac{1}{n}$

b) $(m + n)(mn)$.

46. Prove that the area of an equilateral triangle of side 'a' units is $\frac{a^2\sqrt{3}}{4}$ square units. 3

OR

ΔABC is right angled triangle right angled at C. D is a point on the side $\overline{AC}$ and E is a point on the side $\overline{BC}$. Show that

$AB^2 + DE^2 = AE^2 + BD^2$.

V. Answer the following questions :

47. Construct direct common tangents to two circles of radii 4 cm and 2 cm whose centres are 8 cm apart. 4

48. Find the sum of first ten terms of an Arithmetic progression whose fourth term is 13 and eighth term is 29. 4

OR

Find the three consecutive terms of a Geometric progression whose sum is 14 and their product is 64.

49. Prove that "if two triangles are equiangular, then their corresponding sides are in proportion". 4

50. Solve graphically : $x^2 - x - 2 = 0$. 4