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UNREVISED

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / **English Version**)

(ಹಳೆ ಪಠ್ಯಕ್ರಮ / **Old Syllabus**)

(ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / **Regular Repeater**)

General Instructions to the Candidate :

1. This Question Paper consists of 40 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.

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) $S_\infty = \dfrac{a}{1-r}$

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

(C) $S_\infty = \dfrac{a}{1+r}$

(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 $\lfloor AOB = 100°$, then $\lfloor APO$ is
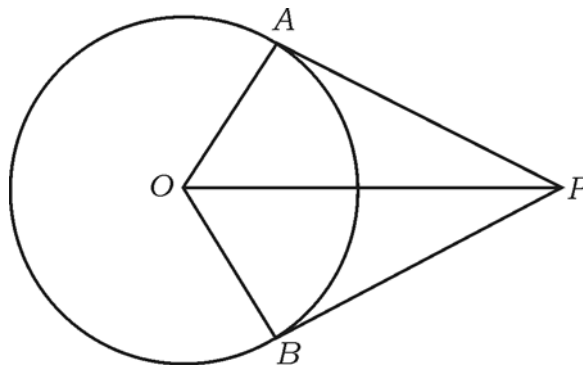
    (A) 50°

    (B) 80°

    (C) 90°

    (D) 40°

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

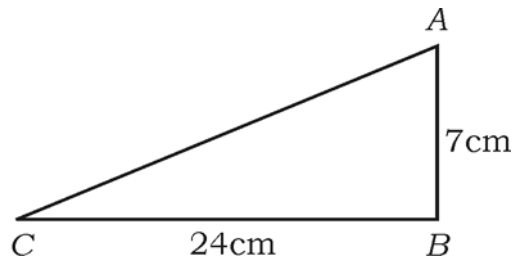   (A) 5

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

    (C) 4

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

8. In △ 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 × 1 = 6

9. Find the arithmetic mean of 16 and 20.

10. Find the value of $^5P_3$.

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 $\dfrac{1}{5}$, $\dfrac{1}{3}$, 1, -1 , ...   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
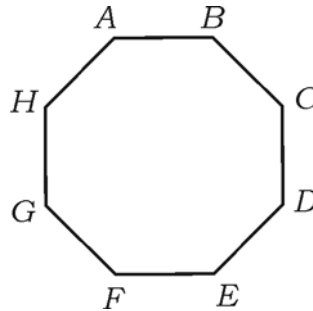
20. In an experiment of tossing a fair coin twice, find the probability of getting

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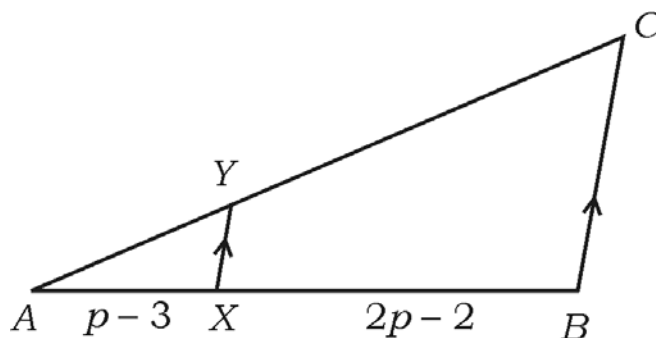
    $(x^3 + x^2 - 3x + 5) \div (x - 1)$. 2

    OR

    If one of the zeros of the polynomial $x^2 - x - (2k + 2)$ is $- 4$, find the value of k.
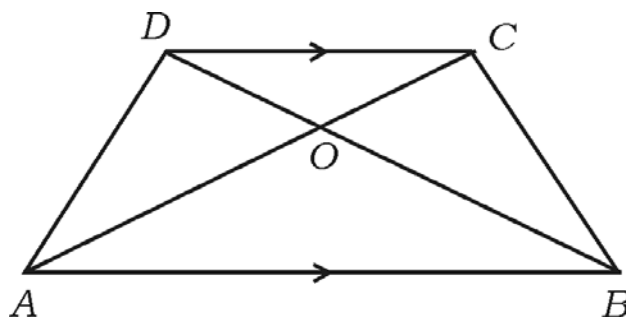
24. Draw a circle of radius 4 cm and construct a tangent at one end of its

     diameter.   2

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

OR

In the trapezium $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\overline{AB} = 2\overline{CD}$ and area of $\triangle AOB$ is

84 cm^2. Find the area of $\triangle COD$.

26. Given $\tan A = \dfrac{3}{4}$, 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	
	220	
To D 100	160	
	120	80 to B
To E 60	80	
	From A	

IV. Answer the following questions :

31. 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

32. 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 $\pi = \dfrac{22}{7}$).   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 $\pi = \dfrac{22}{7}$).

33. 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

34. 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 $\sqrt{\dfrac{1 + \sin A}{1 - \sin A}} = \sec A + \tan A$.

35. 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) $\dfrac{1}{m} + \dfrac{1}{n}$

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

36. Prove that the area of an equilateral triangle of side 'a' units is

$\dfrac{a^2\sqrt{3}}{4}$ square units. 3

OR

$\triangle ABC$ 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 :

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

38. 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.

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

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

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