ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ
ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560 003

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD
Malleshwaram, Bengaluru – 560 003

2024-25ರ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ-1
S.S.L.C. MODEL QUESTION PAPER-1 – 2024-25

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

ವಿಷಯ ಸಂಕೇತ : **81-E**	**Subject Code : 81-E**
ಸಮಯ : 3 ಗಂಟೆ 15 ನಿಮಿಷಗಳು]	[Time : 3 Hours 15 Minutes
ಗರಿಷ್ಠ ಅಂಕಗಳು : **80**]	[Max. Marks : **80**

General Instructions to the Candidate :

1. This question paper consists of 38 questions.

2. Follow the instructions given against the questions.

3. Figures in the right hand margin indicate maximum marks for the questions.

4. 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.

[Turn over

I.   *Four* alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.   **8 × 1 = 8**

1.   The HCF of $5^2 \times 2$ and $2^5 \times 5$ is

     (A) 2×5 (B) $2^5 \times 5$

     (C) $5^2 \times 2^6$ (D) $2^5 \times 5^2$

2.   The sum of first *'n'* natural numbers is

     (A) $n(n+1)$ (B) $\dfrac{n(n+2)}{2}$

     (C) $\dfrac{n(n+1)}{2}$ (D) $n(n-1)$

3.   In a pair of linear equations $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$,

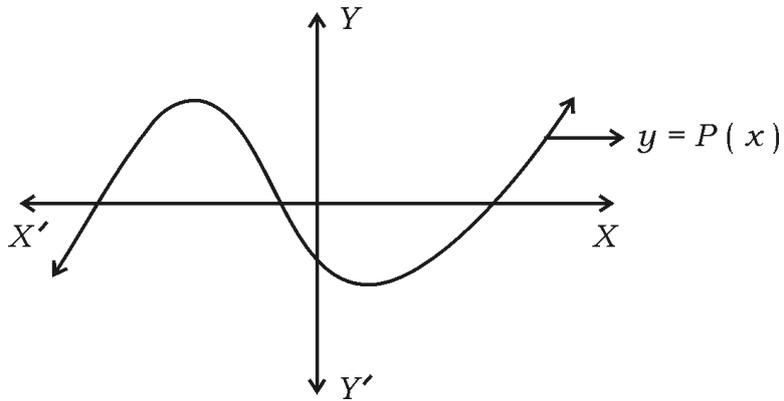   which of the following situations cannot arise ?

     (A) $\dfrac{a_1}{a_2} \neq \dfrac{b_1}{b_2}$

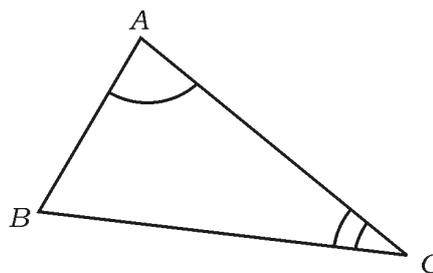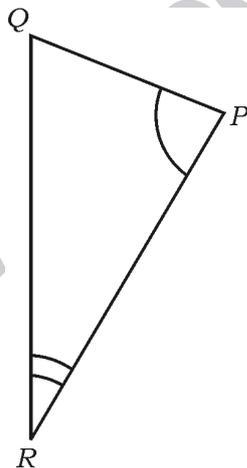   (B) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$

     (C) $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$

     (D) $a_1 = a_2$, $b_1 = b_2$, $c_1 = c_2$

4. The number of zeroes of the polynomial $y = P(x)$ in the given graph is

(A) 2   (B) 3

(C) 4   (D) 5

5. $x(x+2) = 6$ is a

(A) linear equation   (B) quadratic equation

(C) cubic polynomial   (D) quadratic polynomial

6. In the figure, $\Delta\ PQR \sim \Delta\ ABC$. The pair of corresponding sides in the following is

(A) PQ and AB (B) PR and AB

(C) QR and AC (D) PR and BC

[Turn over

7. $\sin^2 A - \cos^2 A$ is equal to

   (A)   1   (B) $1 - 2\cos^2 A$

   (C) $1 + 2\cos^2 A$ (D) -1

8. The sum of the probability of all elementary events of a random experiment

   is

   (A)   0   (B) $\dfrac{1}{2}$

   (C)   1   (D) -1

II.   **Answer the following questions :**   **8 × 1 = 8**

9. Find the value of *'b'* if the pair of linear equations $2x + by = 8$ and

   $2 (2x + 3y) = 16$ has infinite solutions.

10. Write the degree of the polynomial $P (x) = 5x^3 - 3x^2 + 12x - 8$.

11. If $\sin A = \dfrac{\sqrt{3}}{2}$ and $\cos A = \dfrac{1}{2}$, then find the value of $\tan A$.

12. Write the empirical relation between the three measures of central tendency

   Mean, Median and Mode.

13. Express the quadratic equation $\dfrac{x + 1}{2} = \dfrac{3}{x}$ in the standard form.

14. Find the distance of the point (6, 8) from the origin.

15. In the figure, △ *POQ* ~ △ *ROS* and *PQ* || *SR*. If *PQ* : *SR* = 1 : 2, then find *OS* : *OQ*.
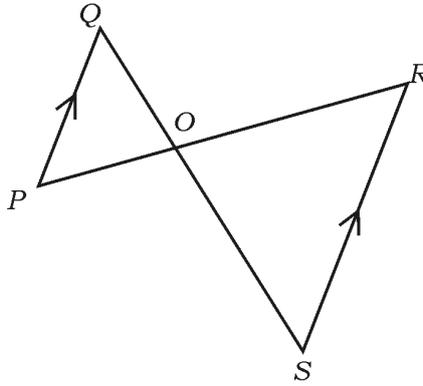
16. The circumference of the circular base of a cylinder is 44 cm and its height is 10 cm. Find the curved surface area of the cylinder.

III.   Answer the following questions :   **8 × 2 = 16**

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

18. What is a composite number ? Which is the composite number among 23 and 24 ?

OR

State the fundamental theorem of arithmetic. Write the composite number which has 7 and 3 as its only prime factors.

19. Find the 21st term of the arithmetic progression 5, 9, 13, ... using formula.

[Turn over

20. Solve the pair of linear equations by elimination method :

   $x + y = 4$

   $2x + y = 6$

21. If the quadratic equation $x^2 + bx + 9 = 0$ has two equal real roots, then find the equation ($b < 1$).

22. Find the coordinates of the point which divides the line segment joining the points $A (1, -3)$ and $B (8, 5)$ in the ratio $3 : 1$ internally.

23. In the figure, XY is a tangent at the point P to a circle with centre O. Q is a point on XY. Show that $OQ > OP$.
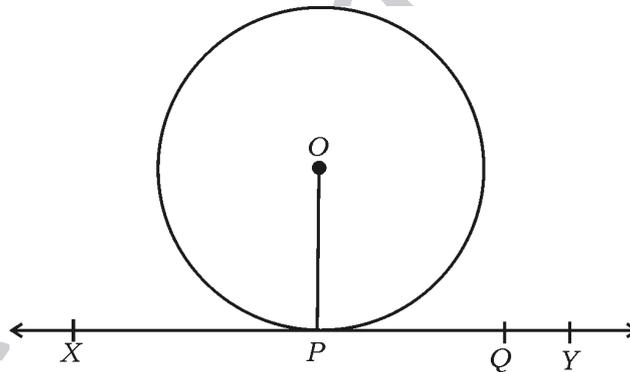
24. A toy is in the form of a cone of radius 3·5 cm mounted on a hemisphere of same radius. The total height of the toy is 15·5 cm. Find the total surface area of the toy.

OR

The volume of a sphere is $\dfrac{539}{3}$ cm^3 . Find its surface area.

IV. **Answer the following questions :** **9 × 3 = 27**

25. One of the zeroes of a polynomial $P(x) = x^2 - 5x + k$ is 1 more than the other zero. Find the value of k.

26. Find the two numbers whose sum is 27 and the product is 182.

OR

The altitude of a right angled triangle is 7 cm less than its base. If the hypotenuse is 13 cm, then find the other two sides.

27. Prove that

$(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$.

28. Find a relation between x and y such that the point $P(x, y)$ is equidistant from the points $A(7, 1)$ and $B(3, 5)$. Also find the coordinates of the point P, if A, P and B are collinear.

OR

If the points $A(4, 5)$, $B(7, y)$, $C(4, 3)$ and $D(x, 2)$ are the vertices of a parallelogram, then find the values of x and y.

[Turn over

8

29. Find the mean for the following frequency distribution table :

Class interval	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	2	3	5	7	3

OR

Find the median for the following frequency distribution table :

| Class interval	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
Frequency	2	3	6	4	5

30. A boy and a girl are born in the month of September. Find the probability that both will have

   i) different birthdays

   ii) the same birthday.

31. In a scalene triangle *ABC*, draw a line parallel to *BC*. Let this line intersect *AB* at *D* and *AC* at *E*. If *DE* : *BC* = 2 : 5, *AD* = 2 cm, *AE* = 3 cm and *DE* = 4 cm, then find the perimeter of the triangle *ABC*.

32. Prove that the lengths of tangents drawn from an external point to a circle are equal.

33. The area of the sector *OAYB* shown in the figure is 462 cm^2. Find the length of the arc *AYB* if $\lfloor AOB$ = 120°.
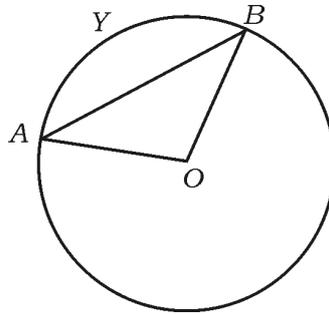
OR

The area of the sector of a circle is numerically equal to the length of the arc of the same sector. If the length of the arc is $\dfrac{44}{21}$ cm, then find the radius of the circle and also the angle subtended by the arc at the centre.

V. **Answer the following questions :** **4 × 4 = 16**

34. Find the solution of the given pair of linear equations by graphical method :

$x + y = 6$

$2x + y = 10$

35. The ratio of 11th and 8th terms of an arithmetic progression is 3 : 2. Find the ratio of the sum of the first 5 terms to the sum of the first 21 terms of it.

36. Prove that "If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio (or in proportion) and hence the two triangles are similar".

[Turn over

37. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in the figure. If the height of the cylinder is 10 cm, and the radius of its base is 3·5 cm, then find the total surface area of the article.
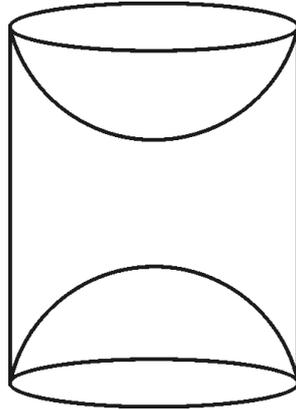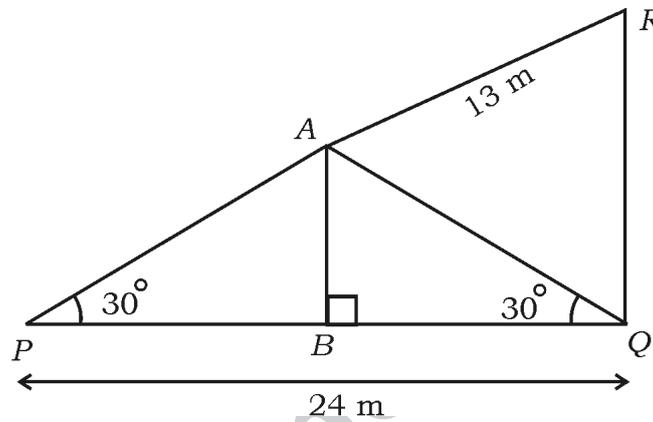
OR

A juice seller was serving his customers using glass as shown in the figure. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of the glass was 10 cm, then find the apparent capacity of the glass and its actual capacity. (Take π = 3·14)
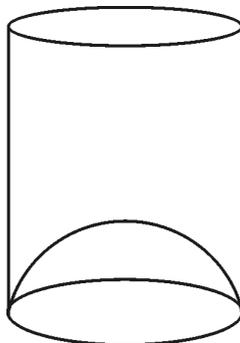
VI. Answer the following question :   1 × 5 = 5

38. *AB* and *RQ* are two vertical towers standing on a level ground. The angle of elevation of the top of the tower from a point *P* on the same ground and from the foot of the tower *QR* are 30° as shown in the figure. If *PQ* = 24 m and *AR* = 13 m, then find the heights of the towers *AB* and *RQ*. Also find the length of *AP*.

(Take $\sqrt{3}$ = 1·7)