



विद्या सर्वार्थ साधिका

ANANDALAYA
ANNUAL EXAMINATION
Class: IX

Subject: Mathematics (041)

Date : 28 – 02 – 2025

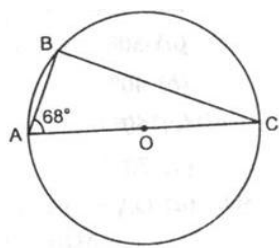
M.M : 80

Time : 3 Hours

General Instructions:

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21 – 25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26 – 31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32 – 35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36 – 38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 2 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.

SECTION A

1. Value of $\sqrt{6} \times \sqrt{27}$ is equal to _____. (1)
(A) $9\sqrt{2}$ (B) $3\sqrt{3}$ (C) $2\sqrt{2}$ (D) $9\sqrt{3}$
2. In the given figure O is a centre of the circle and AC is a diameter of the circle and $\angle BAO = 68^\circ$, then find the measure of $\angle BCO$. (1)

(A) 11° (B) 22° (C) 44° (D) 68°
3. Find the height of the cone, if its slant height is 34 cm and base diameter is 32cm. (1)
(A) $\sqrt{2180}$ cm (B) $\sqrt{1412}$ cm (C) 30 cm (D) 2cm
4. The number of Euclid's postulates is _____. (1)
(A) 3 (B) 4 (C) 6 (D) 5
5. Which of the following is irrational? (1)
(A) 0.140140014000140000... (B) 0.1416 (C) $0.\overline{1462}$ (D) 0.14
6. Two quantities X and Y are such that $X = Y$. Which of these equations illustrates the Euclid's axiom "if equals are added to equals, the wholes are equal"? (1)
(A) $X + p = Y - p$ (B) $X + p = Y + p$ (C) $X + p = Y$ (D) $X = y + p$
7. Expansion of $(x - y)^3$: (1)
(A) $x^3 + y^3 + 3x^2y + 3xy^2$ (B) $x^3 + y^3 - 3x^2y + 3xy^2$
(C) $x^3 - y^3 - 3x^2y + 3xy^2$ (D) $x^3 - y^3 + 3x^2y - 3xy^2$

8. Write linear equation $9x + 3y - 6 = 0$ in the form of $y = mx + c$, then find the value of $m + c$. (1)
 (A) -3 (B) 1 (C) 5 (D) -1
9. Which of the following is not a criterion for congruence of triangle? (1)
 (A) SSA (B) ASA (C) SSS (D) SAS
10. If $x = 1 - \sqrt{2}$ then what will be the value of $x + \frac{1}{x}$. (1)
 (A) $2\sqrt{2}$ (B) $-2\sqrt{2}$ (C) $\sqrt{2}$ (D) 2
11. A point which lies in third quadrant have _____ sign. (1)
 (A) $(-, +)$ (B) $(+, +)$ (C) $(-, -)$ (D) $(+, -)$
12. Two angles of a quadrilateral are 60° and 70° and other two angles are in the ratio $8 : 15$, then the remaining two angles are _____. (1)
 (A) $64^\circ, 120^\circ$ (B) $72^\circ, 135^\circ$ (C) $40^\circ, 75^\circ$ (D) $80^\circ, 150^\circ$
13. ΔABC is right triangle at A, if $AB = AC = 4$ cm, find the area in cm^2 . (1)
 (A) 16 (B) 8 (C) $4\sqrt{3}$ (D) $4\sqrt{2}$
14. Class mark of the class $75 - 90$ is _____. (1)
 (A) 80 (B) 82.5 (C) 85 (D) 15
15. Which of the following is p/q form of $2.\bar{3}$? (1)
 (A) $22/9$ (B) $23/9$ (C) $7/3$ (D) $8/3$
16. Which of the following linear equation have $x = 1$ and $y = -1$ as one of the solution. (1)
 (A) $2x + y = 3$ (B) $2x - y = -3$ (C) $2x - y = 1$ (D) $2x + y = 1$
17. Given quadrilateral ABCD such that $\angle C = 90^\circ$ and diagonal AC and BD bisect each other at O, (1)
 then the quadrilateral ABCD is _____.
 (A) rectangle (B) trapezium (C) parallelogram (D) rhombus
18. Find the value of (abscissa P) – (ordinate of Q), if the coordinates of the two points are P (5, 3) and (1, 5). (1)
 (A) 2 (B) 0 (C) 4 (D) -2

In the following questions 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (A) Both A and R are true and R is the correct explanation of A.
 (B) Both A and R are true but R is not the correct explanation of A.
 (C) A is true but R is false.
 (D) A is false but R is true.
19. A: If angles 'a' and 'b' form a linear pair of angles and $a = 40^\circ$, then $b = 140^\circ$. (1)
 R: The sum of the angles of a triangle is 180°
20. A: The area of a triangle having two sides 8 cm and 11 cm and perimeter 32 cm is $8\sqrt{30} \text{ cm}^2$. (1)
 R: Area of the triangle is $\sqrt{(s-a)(s-b)(s-c)}$.

SECTION - B

21. In which quadrant the given point lies? $A(3, 2)$, $B(4 - 2)$, $C(-1, 3)$ and $D(3, -1)$. (2)
22. (A) The height of the cone is 15 cm and if its volume is 1570 cm^3 , find the diameter of the base. (2)
(use $\pi=3.14$)

OR

- (B) Find the volume of sphere whose diameter is 21 cm. (Use $\pi = 22/7$)
23. Find the area of the triangle whose sides are 13cm, 14cm and 15cm. (2)
24. (A) Express linear equation $\frac{1}{3}(x - 4) = \frac{1}{6}(y - 1)$ in standard form $ax + by + c = 0$ and find the value of $a + b + c$. (2)

OR

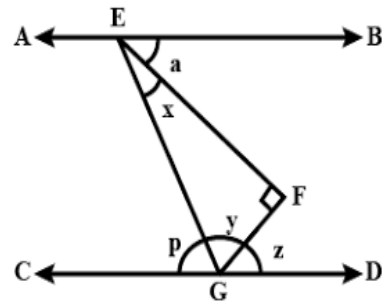
- (B) If $x = 2$ and $y = 2$ is one of the solutions of $2x + 3k = y$ then find the value of k .
25. The semi perimeter of triangle is 96 cm and the sides are in the ratio 3 : 4 : 5. Find the largest side of the triangle. (2)

SECTION -C

26. Atul visit the pizza shop and place an order for one pizza and 2 burgers, and paid ₹ 360. If the cost of one buerger is ₹ x and pizza is ₹ y express this detials in form linear equation. Also, find two different solution of it. (3)
27. (A) If $x = 3 + 2\sqrt{2}$, then find whether $x + \frac{1}{x}$ is rational or irrational. (3)

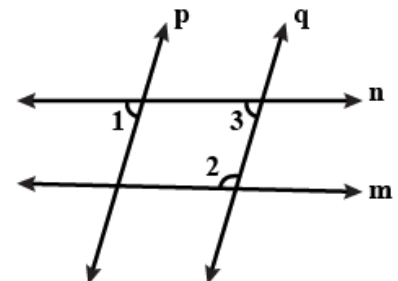
OR

- (B) Locate $\sqrt{6}$ on the number line.
28. (A) In the given figure $x : y = 3 : 2$ and $y + z = 100^\circ$ and $AB \parallel CD$, find $\angle a$. (3)



OR

- (B) Lines $l \parallel m$, and $p \parallel q$ in the given figure, $\angle 1 = 75^\circ$, find $\angle 3$.
Also prove that $\angle 2 = \angle 1 + \frac{1}{3}$ of a right angle.



29. Express $0.\bar{7} + 0.\bar{4}$ in the form of p/q , where p and q are integers and $q \neq 0$. (3)
30. If $(x, y) = (3, 4)$ is the solution for the following equations. Find the values of p , q and r . (3)
(i) $3x + 4y = p$
(ii) $qx + y = 4$
(iii) $3x + ry = 15$
31. Prove that, if two lines intersect, vertically opposite angles are equal. (3)

SECTION –D

32. (A) Kiran is class IX girl, her performance in half yearly exam is given below. Draw the bargraph for the given data. (5)

Subject	English	Hindi	Mathematics	Science	Social Science
Marks	60	40	80	50	70

Based on the above data answer the following questions:

- Which subject Kiran score least marks?
- What is the difference of the score in both the languages?

OR

- (B) Draw a histogram and frequency polygon on the same graph for the following data:

Class	150 – 200	200 – 250	250 – 300	300 – 350	350 – 400	400 – 450	450 – 500
Frequency	5	3	5	6	8	7	1

33. If the polynomial $p(x) = x^3 - 3x^2 - x + k$ and $q(x) = x^2 - x - 2$ and $p(-1) = q(-1)$, then find the value of k, Also find the factors of $p(x)$. (5)

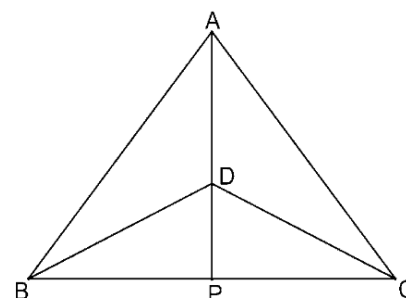
34. (A) Prove that, equal chords of a circle subtend equal angles at the centre. Using this theorem find the value of p, If AB and CD are two equal chords in the circle with centre O, and $\angle COD = 85^\circ$, $\angle AOB = 2p + 35^\circ$. (5)

OR

- (B) If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord.

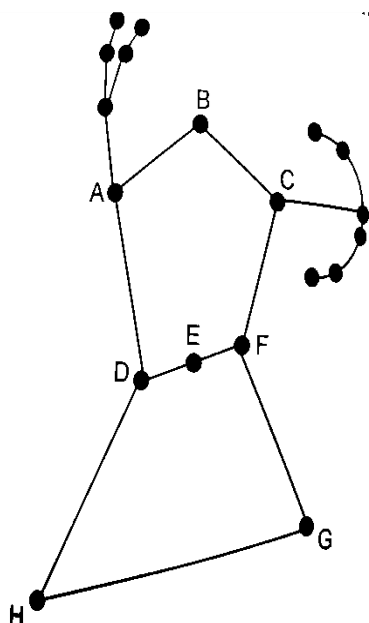
35. $\triangle ABC$ and $\triangle DBC$ are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see figure). If AD is extended to intersect BC at P, show that;

- $\triangle ABD \cong \triangle ACD$
- $\triangle ABP \cong \triangle ACP$
- AP bisects $\angle A$ as well as $\angle D$.
- AP is the perpendicular bisector of BC.



SECTION – E

- 36.



The stars forming a group that has recognizable shape is a constellation. One of the most famous constellations which you can see during winter in the late evening is Orion. It is located on the celestial equator and visible throughout the world in the Northern hemisphere. Total number of stars in the Orion constellation is 19 but 7 (i.e A, B, C, F, G, H, D) are the main prominent and bright star as shown in figure.

- What is the shape of the quadrilateral formed by the four stars at D, F, G and H? (1)
- Leaving the star marked at B, D, E and F, what is the shape formed by remaining four bright stars of the Orion? (1)
- In quadrilateral DFGH, if $DF \parallel GH$ and $DH = FG$, what is the relationship between $\angle D$ and $\angle F$? (2)

OR

- A geometrical shape is formed by the stars marked at A, B, C and D, by joining CD. Suppose $AB \parallel CD$, $\angle B = 90^\circ$ and $\angle D = 60^\circ$, then find $\angle A$ and $\angle C$.

37. Four friends went for a picnic at a hill station. Due to peak season, they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. They were carrying 300 m^2 cloth with them. As shown in the figure they made the tent with height 10 m and diameter of base 14 m. The remaining cloth was used for the floor.



(Use $\pi = 22/7$ and $\sqrt{149} = 12.2$)

- What is the area of the floor?
- What is the slant height of the tent?
- What is the volume of the tent?

(1)
(1)
(2)

OR

- What is the total surface area of the tent?

38. In a clubhouse of a residential society, five friends Aakanksha, Babita, Canny, Daksh and Elisa are playing a game using cards. They have prepared five cards and written the algebraic expression on cards. They have shown cards to each other. The expression $6x^3 + 4x^2 + 8x + 4$ was written on Aakanksha's card. When the expression is multiplied by 2 that is written on Babita's card and when it is divided by 2 that expression is written on Canny's card. Daksh and Elisa have written $2x^3 + 16$ and $2x + 10$ on their cards respectively.

$6x^3 + 4x^2 + 8x + 4$	$12x^3 + 8x^2 + 16x + 2$	$3x^3 + 2x^2 + 4x + 2$	$2x^3 + 16$	$2x + 10$
Aakanksha	Babita	Canny	Daksh	Elisa

From the above information answer the following questions:

- What is the degree of the polynomial written on Aakansha's card?
- The expression on Babita's card is $12x^3 + 8x^2 + 16x + 8$. Find its value at $x = 1$.
- Find the zero(s) of Daksh's card polynomial.

(1)
(1)
(2)

OR

- Give the name and find the zero of polynomial written on Elisa's card?