TIME : 2 HRS. **MAX. MARKS : 40**

GENERAL INSTRUCTIONS :

⇥ The question paper consists of **14 questions** divided into **3 sections A, B, C.**

⇥ **All questions are compulsory.**

⇥ Section A comprises of **6 questions of 2 marks each.** Internal choice has been provided in two questions.

⇥ Section B comprises of **4 questions of 3 marks each.** Internal choice has been provided in one question.

⇥ Section C comprises of **4 questions of 4 marks each.** An internal choice has been provided in one question. It contains two case study based questions.

SECTION-A

1. Which term of the A.P. 120, 116, 112 ....is first negative term ?

OR

Sum of first n terms of an A.P. is $5n^2 - 3n$. Find the A.P. and also find its 16th term.

2. For what value of k does $(k - 12)x^2 + 2(k - 12)x + 2 = 0$ have equal roots ?

3. Prove that the parallelogram circumscribing a circle is a rhombus.

4. Find the ratio of the total surface area to the lateral surface area of a cylinder with base radius 80 cm and height 20 cm.

5. If the mean of the following distribution is 27, find the value of P :

Class	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	8	P	12	13	10

6. The sum of the areas of two squares is 640 m^2. If the difference in their perimeter is 64 m, find the sides of the two squares.

OR

Find the roots of the following quadratic equation.

$(x^2 - 2x)^2 - 4(x^2 - 2x) + 3 = 0$

SECTION-B

7. Find the mode of given data

Classes	0 – 50	50 – 100	100 – 150	150 – 200	200 – 250	250 – 300	300 – 350
Frequency	2	3	5	6	5	3	1

8. Divide a line segment 8.8 cm long internally in the ratio 4 : 7 and measure the two parts.

9. Find the median wage from the following data :

Wages (in Rs.)	800-820	820-840	840-860	860-880	880-900	900-920	920-940
Number of workers	7	14	19	25	20	10	5

10. From a point 100 m above a lake, the angle of elevation of a stationary helicopter is 30° and the angle of depression of reflection of the helicopter in the lake is 60°. Find the height of the helicopter.

OR

A highway leads to the foot of 300 m high tower. An observatory is set at the top of the tower. It sees a car moving towards it with an angle of depression of 30°. After 15 s angle of depression becomes 60°.

Find the distance travelled by the car during this time.

SECTION-C

11. A circus tent is made of canvas and is in form of right circular cylinder and right circular cone above it. The diameter and height of the cylindrical part of the tent is 126 m and 5 m respectively. The total height of the tent is 21 m. Find the total cost of the tent, if the canvas used costs Rs. 12/m².

OR

A well of diameter 3 m is dug 14 m deep. The Earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 4 m to form an embankment. Find the height of the embankment

12. In figure, a ΔABC is drawn to circumscribe a circle of radius 3 cm ; such that the segments BD and DC are respectively of lengths 6 cm and 9 cm. If the area of ΔABC is 54 cm², then find the length of sides AB and AC.
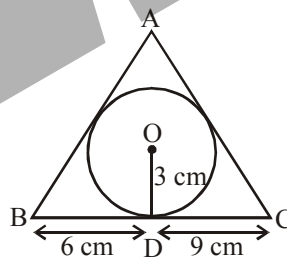
13. **Case Study-1 (200 m Race)**

A Rafree is standing on the side of the athletic track and kept a stopwatch, which is used to find the time that it took a group of students to run 200 m.
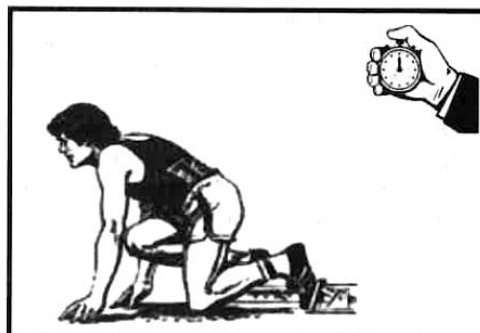
In different time intervals, different number of students completed the race are given in the table as shown below

Time in (sec)	0-50	50-100	100-150	150-200
Number of students	10	15	7	8

(i) Find the average time taken to complete 200 m race.

(ii) Find mode of the given data,

14. **Case Study-2 (Labour Suffer from Literacy)**

India's literacy rate has increased six times since the end of the British rule in 1947. From 12% to 74% in recent times. Yet India has the world's largest population of illiterate people according to a report of oxfam.

Ram asks the labour to dig a well up to a depth of 10 m. Labour charges Rs. 150 for first metre and Rs. 50 for each subsequent metres. As labour was uneducated, he claims Rs. 550 for the whole work.

(i) What should be the actual amount to be paid to the labour?

(1) Rs. 655   (2) Rs. 600   (3) Rs. 645   (iv) Rs. 640

(ii) How much money Ram will save, if he agree with Rs. 550?

(1) Rs. 50   (2) Rs. 40   (3) Rs. 45   (4) Rs. 55