Revision Test Term II(2021-22)

CLASS X

Mathematics

Time Allowed: 2 hours | Maximum Marks: 40

General Instructions:

1. **The question paper consists of 14 questions divided into 3 sections A, B, C.**
2. **All questions are compulsory.**
3. **Section A comprises 6 questions of 2 marks each. Internal choice has been provided in two questions.**
4. **Section B comprises 4 questions of 3 marks each. Internal choice has been provided in one question.**
5. **Section C comprises 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.**

Section A

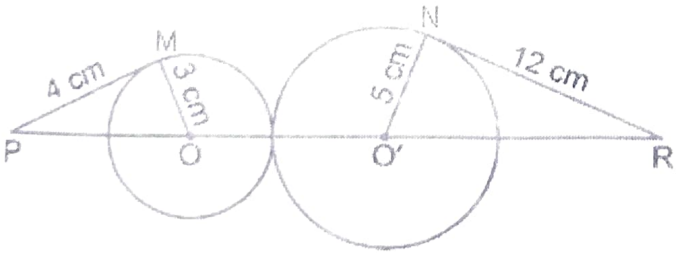
Q1 Find the value of p for which the quadratic equation $(p-12)y^2+2(p-12)y+2=0$ has equal roots.

Q2 Which term of the AP 7,13,19, ….., 247 is the middle term. Also find the value of the middle term

OR

An arithmetic progression is such that the sum of the first 8 numbers is –100 and the common difference is 1. For what value of n would the sum of first n numbers be –100 again?

Q3 In the given figure , O and O' are centres of circles with radii 3 cm and 5 cm respectively. P and R are external points from where tangents PM and RN are drawn. Find the length of PR



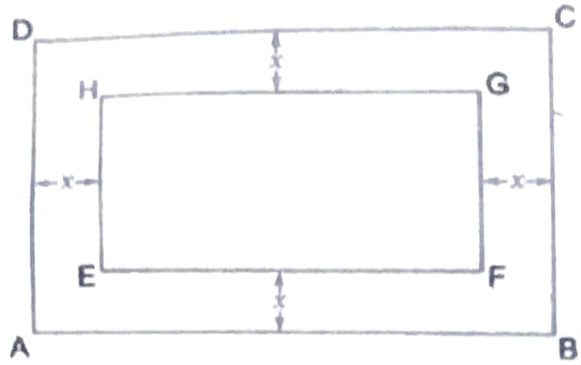
Q4. A solid is hemispherical at the bottom and conical (of same radius) above it.If the surface areas of two parts are equal, then find the ratio of its radius and the height of the conical part .

Q5 . Consider the following frequency distribution:

Height (in cm)	Less than 140	Less than 145	Less than 150	Less than 155	Less than 160	Less than 165
Number of girls	4	11	29	40	46	51

Find the mode of data.

Q6. In a rectangular park of dimensions 50 m × 40 m, a rectangular pond is constructed so that the area of grass strip of uniform width surrounding the pond would be 1184 m^2. Represent the above situation in the form of an equation.



OR

The length of a rectangle is thrice as long as the side of a square. The side of a square is 4cm more than the width of the rectangle. Their areas being equal, Represent the above situation in the form of an equation.

Section B

Q7. A petrol pump owner wants to analyze the daily need of diesel at the pump. For this he collected the data of vehicles visited in 1 hour. The following frequency distribution table shows the classification of the number of vehicles and quantity of diesel filled in them.

Diesel Filled (in Litres)	Number of Vehicles
3-5	5
5-7	10
7-9	10
9-11	7
11-13	8

Find the average diesel filled in 1 hour.

Q8. Construct a pair of tangents to a circle of radius 4 cm which are inclined at an angle of 90°.

Q9 The following frequency distribution gives the monthly consumption of electricity in a locality of 80 families.If the median is 206 units, find the missing frequency x & y.

Monthly consumption of electricity(in units)	Number of families
170-180	4
180-190	x
190-200	12
200-210	15
210-220	13
220-230	y
230-240	14
240-250	6

Q10. From a point on the ground 30 m away from the foot of the tower, the angle of elevation of the top of the tower and top of the water tank, which is fixed at the top of tower, are respectively 30° and 45°. Find the height of the tower and depth of the water tank. (Use $\sqrt{3} = 1.73$)

OR

Two boats approach a lighthouse in mid-sea from opposite directions. The angles of elevations of the top of the light house from two boats are 30° and 45°. If the distance between two boats is 100 m, find the height of the light house. (Use $\sqrt{3} = 1.73$)

Section C

Q11. A toy is in the form of a. hemisphere surmounted by a right circular cone of the same base radius as that of the hemisphere. If the radius of base of the cone is 21 cm and its volume is two- third of the volume of the hemisphere, calculate the height of the cone and the surface area of the toy.

Q12. If a, b, c are the sides of a right triangle where c is the hypotenuse, prove that the radius r of the circle which touches the sides of the triangle is given by

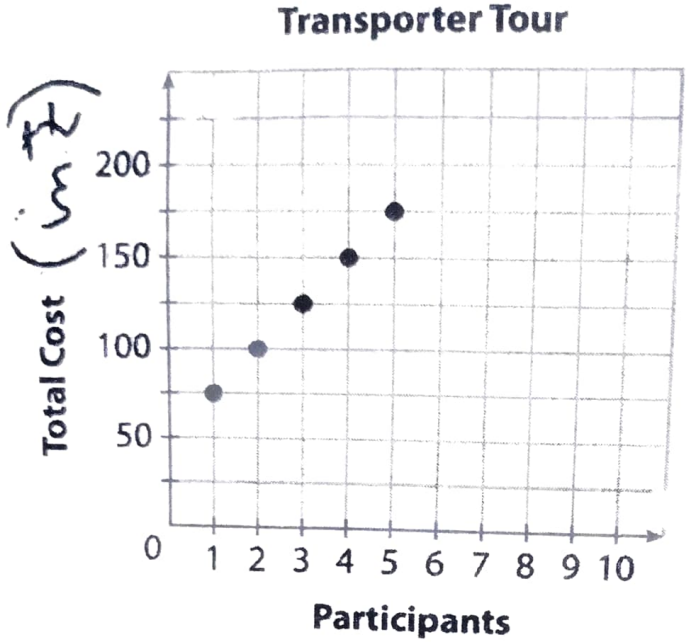
$$r = \frac{a + b - c}{2}$$

OR

Prove that the rectangle circumscribing a circle is a square.

Case study 1

Q13. The given graph shows how the cost of a personal transporter tour depends on the number of participants .

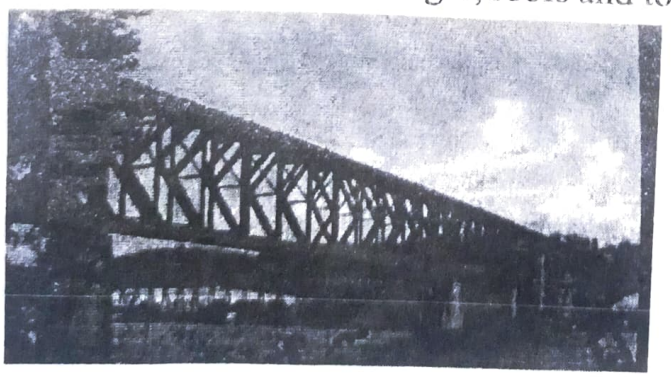


a) Is the above graph representing an AP? If yes, Write the general term of AP and find the common difference. (2)

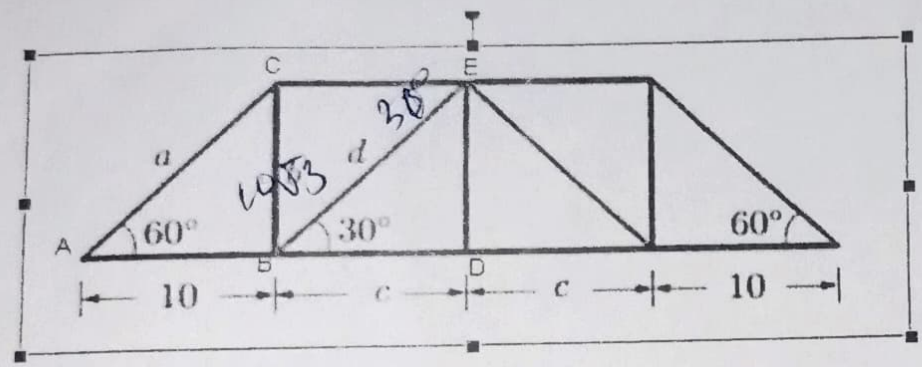
b) What will be the cost of the tour for the 9th participant and the total cost incurred if 15 participants decided to go on a tour. (2)

Case study 2

Q14. A truss is a structure that consists of members organized into connected triangles so that the overall assembly behaves as a single object. Trusses are most commonly used in bridges, roofs and towers.



Consider the line diagram of truss shown below and answer the following questions : (Use $\sqrt{3} = 1.73$)



a) Find the lengths a, b, c and d (2)

b) If the horizontal rod length AB is changed to 15 inches instead of 10 inches then by how much percent the length AC increases? (2)