Mathematics – Basic (241)
Class – X, Session – 2021-22
Term – 2

Time: - 2hrs. M.M. – 40

General Instructions: -

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

Section - A

Q.1 Find the roots of the quadratic equation $2x^2 - 7x - 15 = 0$ (2)

Or

Find the value of P for which the quadratic equation $2x^2 + Px + 8 = 0$, has equal roots.

Q.2 A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13cm. find the inner surface area of the vessel. (2)

Q.3 The percentage of marks obtained by 100 students in an examination are given below. Find the mode (2)

Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65
No. of students	14	16	18	23	18	8	3

Q.4 Find the 15^{th} term of -10, -5, 0, 5, -------- (2)

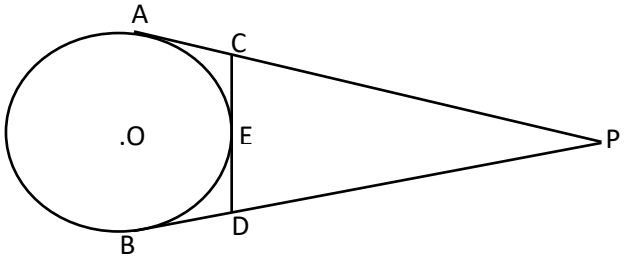
Q.5 The mean of the following distribution is 34. Find the value of P. (2)

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	15	20	35	P	10	42

Q.6 Prove that the length of tangents drawn from an external point to a circle are equal. (2)

Or

From an external point P, tangents PA and PB are drawn to a circle with centre O. if CD is the tangent to the circle at a Point E and PA = 14cm. find the perimeter of the ΔPCD



Section - B

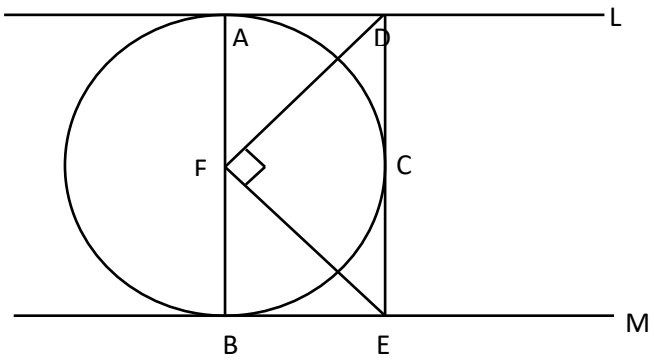
Q.7 How many terms are there are there in the A.P 7, 11, 15,_ _ _ _ _ 139. Also find the sum of first 20 terms of the given A.P (3)

Q.8 A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle of 30^0 with it. The distance between the foot of the tree to the point where the top touches the ground is 8m. Find the height of the tree. (3)

Or

From a point on the ground the angle of elevation of the bottom and the top of a transmission tower fixed at the top of a 20m high building are 45^0 and 60^0 respectively. Find the height of the tower.

Q.9 In figure, l and m are the two parallel tangents at A and B. the tangents at C makes an intercept between the tangent l and m. prove $\angle \mathrm{DFE} = 90^0$. (3)



Q.10 The sum of the squares of three consecutive positive integers is 50. Find the integers. (3)

Section - C

Q.11 Draw a line segment AB of length 8cm. taking A as centre, draw a circle of radius 4cm and taking B as centre, draw another circle of radius 3 cm, construct tangents to each circle from the centre of the other circle.

Or

Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60^0. (4)

Q.12 Find the median marks from the following data. (4)

Marks	Below 10	Below 20	Below 30	Below 40	Below 50
No. of students	15	45	90	102	120

Q.13 Mohan was going from Delhi to Jaipur to National highway. On the way he saw two poles. These two poles were of equal height and standing opposite each other on either side of the highway. Both poles were 80m apart from each other. From a point between them on the road, Mohan found the angle of elevation of top of the poles are 60^0 and 30^0 respectively. (4)
After analysing the situation found out the following questions.

i) Find the height of the poles

ii) Find the position of Mohan, how far he was standing from each pole.

Q.14 During a summer time due to a drought in a village a contractor was given a work of digging a well of diameter 4m and 21m deep. He was also being told to spread evenly the sand taken out around the well to form an embankment in the shape of circular ring of width 3m. Please help the contractor to answer the following questions.

i) Find the height of the embankment.

ii) If the soil taken out from the well is spread out to form a platform 8m by 7m. Find the height of the platform.