SECTION –A (MULTIPLE CHOICE QUESTIONS)

1.	If two tangents inclined at an angle 60° are drawn to a circle of radius 3 cm the length of each tangent is equal to a) 3/2√3 cm b) 6 cm c) 3 cm d) 3√3 cm
2.	A solid piece of iron in the form of a cuboid of dimensions 49 cm × 33 cm × 24 cm, is moulded to form a solid sphere. The radius of the sphere is (a) 21 cm (b) 23 cm (c) 25 cm (d) 19 cm
3.	The wheel of a motorcycle is of radius 35 cm. The number of revolutions per minute must the wheel make so as to keep a speed of 66 km/hr will be (a) 50 (b) 100 (c) 500 (d) 1000

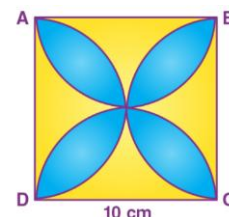## SECTION – B(2 MARKS QUESTIONS)

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4.	In the given figure, AP, AQ and BC are tangents to the circle. If AB = 5 cm, AC = 6 cm and BC = 4 cm, then calculate the length of AP?
5.	A canal is 300 cm wide and 120 cm deep. The water in the canal is flowing at a speed of 20 km/h. How much area will it irrigate in 20 minutes if 8 cm of standing water is desired?
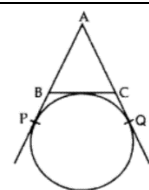
SECTION – C (3 MARKS QUESTIONS)

6.	Let s denote the semi-perimeter of a triangle ABC in which BC = a, CA = b, AB = c. If a circle touches the sides BC, CA, AB at D, E, F, respectively, prove that BD = s – b.
7.	Find the area of the shaded design in the given figure, where ABCD is a square of 10 cm and semicircles are drawn with each side of the square as diameter. (Use π = 3.14).

SECTION – D (5 MARKS QUESTIONS)

8.	Selvi's house has an overhead tank in the shape of a cylinder. This is filled by pumping water from a sump (an underground tank) which is in the shape of a cuboid. The sump has dimensions 1.57 m × 1.44 m × 95cm. The overhead tank has a radius of 60 cm and a height of 95 cm. Find the height of the water left in the sump after the overhead tank has been completely filled with water from the sump which had been full. Compare the capacity of the tank with that of the sump. (Use π = 3.14)
9.	Find the area of the shaded region given in Figure.
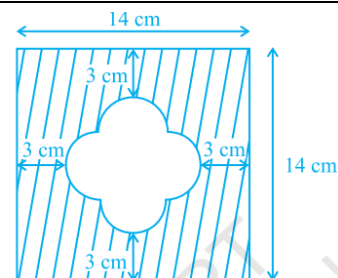
SECTION – E (CASE STUDY)

10.	The boiler is essentially a closed vessel inside which water is stored. Fuel (generally coal) is burnt in a furnace and hot gasses are produced. These hot gasses come in contact with water vessel where the heat of these hot gases transfer to the water and consequently steam is produced in the boiler. Then this steam is piped to the turbine of thermal power plant. There are many different types of boiler utilized for different purposes like running a production unit, sanitizing some area, sterilizing equipment, to warm up the surroundings etc. Rajesh

has been given the task of designing a boiler for NTPC. Boiler consist of a cylindrical part in middle and two hemispherical part it's both end. The cross section of boiler is given below. Length of cylindrical part is the 3 times of radius of hemispherical part.

a) Determine the total surface area of boiler.
b) What is the capacity of boiler?
c) Calculate the ratio of surface area and volume of boiler.