BCM SCHOOL, BASANT AVENUE, DUGRI, LUDHIANA.
OCTOBER ASSIGNEMENT- ANSWER KEY
CLASS- X (MATHEMATICS)
TOPICS: CIRCLES, AREA RELATED TO CIRCLES & SURFACE AREA AND VOLUME.

SECTION –A (MULTIPLE CHOICE QUESTIONS)

1.	(d) $3\sqrt{3}$ cm
2.	(a) 21 cm
3.	(c) 500

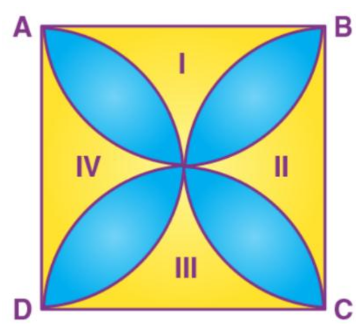
SECTION – B(2 MARKS QUESTIONS)

4\.
2AP = Perimeter of Δ
2AP = 5 + 6 + 4 = 15 cm
AP = 15/2 = 7.5 cm

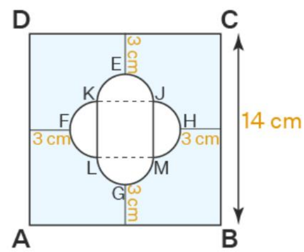
5\.
The volume of water flows in the canal in one hour = width of the canal × depth of the canal × speed of the canal water = 3 × 1.2 × 20 × 1000 m^3 = 72000 m^3
In 20 minutes the volume of water = (72000 × 20)/ 60 = 24000 m^3
Area irrigated in 20 minutes, if 8 cm, i.e., 0.08 m standing water is required
=24000/0.08 = 300000 m^2 = 30 hectares

SECTION – C (3 MARKS QUESTIONS)

6\.
We have,
Semi Perimeter = s
Perimeter = 2s
2s = AB + BC + AC…. [1]
As we know,
Tangents drawn from an external point to a circle are equal
So we have
AF = AE… [2] [Tangents from point A]
BF = BD ….[3] [Tangents From point B]
CD = CE…. [4] [Tangents From point C]
Adding [2], [3], and [4],
AF + BF + CD = AE + BD + CE
AB + CD = AC + BD
Adding BD both side,
AB + CD + BD = AC + BD + BD
AB + BC – AC = 2BD
AB + BC + AC – AC – AC = 2BD
2s – 2AC = 2BD [From (1)]
2BD = 2s – 2b [as AC = b]
BD = s – b

7\.


The radius of semicircle = 10/2 = 5 cm
Now, area of the region I +III = Area of square ABCD – Area of two semicircles of radius 5 cm
$= (10)^2 - 2 \times (½)\, \pi \times (5)^2$
= 100 – 3.14 × 25
= 100 – 78.5
= 21.5 cm^2
Similarly,
Area of the region II + Iv = 21.5 cm^2
Area of the shaded region = Area of square ABCD – Area of the region (I + II + III + IV)

	= 100 – 2× 21.5 = 100 – 43 = 57 cm^2
SECTION – D (5 MARKS QUESTIONS)	
8.	Volume of water in the overhead tank equals the volume of the water removed from the sump. Now, the volume of water in the overhead tank (cylinder) = $\pi r^2 h$ = 3.14 × 0.6 × 0.6 × 0.95 m^3 The volume of water in the sump when full = l × b × h = 1.57 × 1.44 × 0.95 m^3 The volume of water left in the sump after filling the tank = [(1.57 × 1.44 × 0.95) – (3.14 × 0.6 × 0.6 × 0.95)] m^3 = (1.57 × 0.6 × 0.6 × 0.95 × 2) m^3 Height of the water left in the sump = (volume of water left in the sump)/ (l × b) = (1.57× 0.6× 0.6× 0.95 ×2)/ (1.57 ×1.44) = 0.475 m = 47.5 cm Capacity of tank / Capacity of sump = (3.14 × 0.6 × 0.6 × 0.95)/ (1.57 × 1.44 × 0.95) = 1/ 2 Therefore, the capacity of the tank is half the capacity of the sump.
9.	The dimension of FH = EG = 14 - 3 - 3= 14 - 6= 8 cm The side of square JKLM will be 4 cm radius of the semicircle = 4/2 = 2 cm Area of the shaded region = area of square ABCD - area of square JKLM - area of 4 semicircles  Area of square = $(side)^2$ Area of square ABCD = $(14)^2$= 196 cm^2 Area of square JKLM = $(4)^2$= 16 cm^2 Area of semicircle = $\pi r^2/2$ Area of semicircle KEJ = $(22/7)(2)^2/2$= (22/7)(2)= 44/7= 6.2857 cm^2 Since all semicircles are equal. Area of 4 semicircle = 4(area of one semicircle)= 4(6.2857)= 25.14286 cm^2 Area of the shaded region = 196 - 16 - 25.14286 = 180 - 25.14286 = 154.857 cm^2
SECTION – E (CASE STUDY)	
10.	a) Total surface area of boiler = SA of cylindrical part + SA of two hemisphere $= 6\pi r^2 + 2\left(\frac{4\pi r^2}{2}\right) = 6\pi r^2 + 4\pi r^2 = 10\pi r^2$ b) Volume of boiler, = Volume of cylinder+ Volume of two hemisphere $= \pi r^2 l + 2\left(\frac{2\pi}{3} \times r^3\right) = \pi r^2 \cdot 3r + \frac{4\pi}{3} \times r^3 = \left(3 + \frac{4}{3}\right)\pi r^3 = \frac{13}{3}\pi r^3$ c) Ratio of volume to the surface= $\frac{\frac{13}{3}\pi r^3}{10\pi r^2} = \frac{13}{30} r$