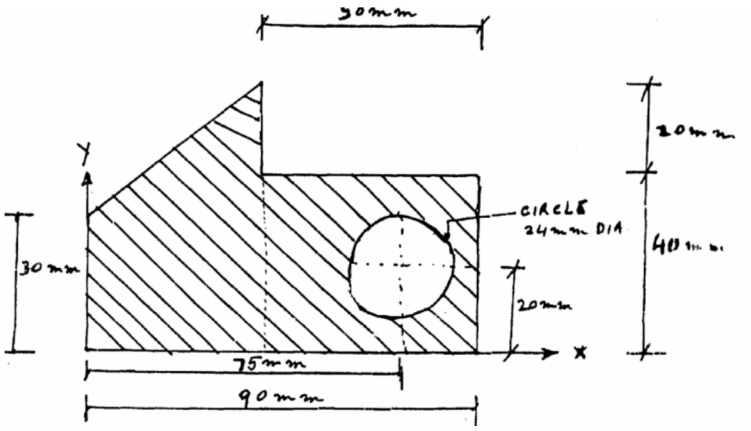
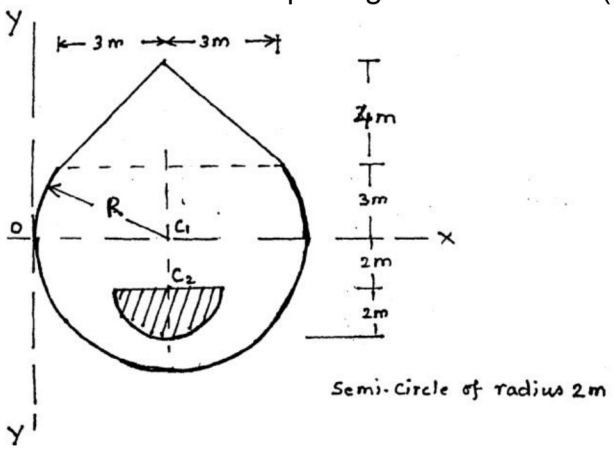
TYPE 1 C.G. OF AREAS

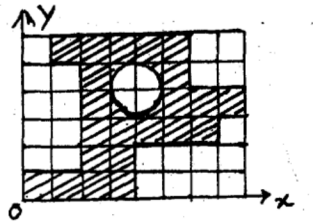
1. Find the position of c.g. of the shaded area. (Ans : X = 40.65, Y = 21.79)

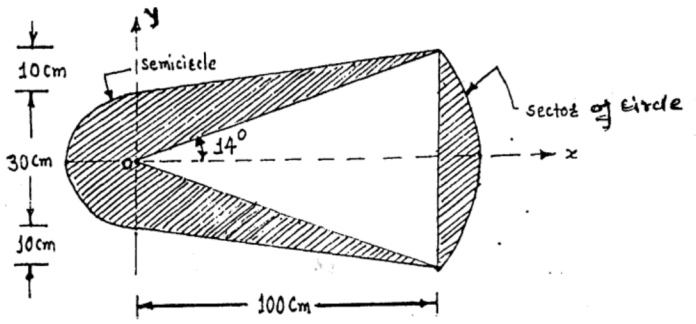


2. Find coordinates of centre of gravity for the following lamina. Please note that the shaded area is the opening in the lamina. (Ans : X = 4.243 , Y = 0.7044)



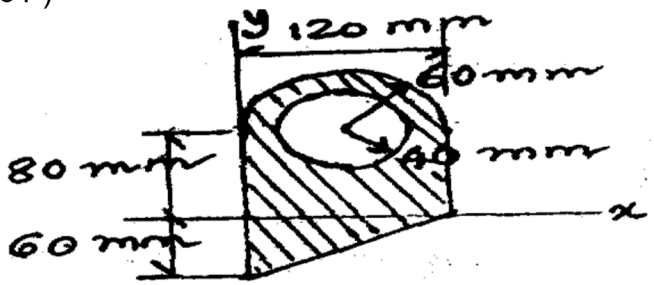
3. Calculate numerically centroid of the shaded area shown in Fig. (Ans : X = 29.64)



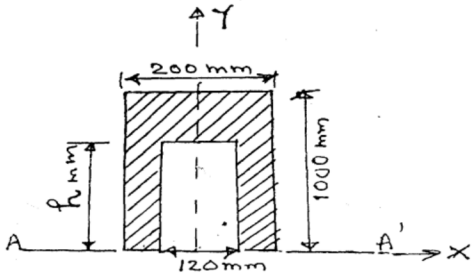


4. Calculate, numerically, the co-ordinates x and of the centroid C of the shaded area shown in figure. Each of the grid measures 10 mm x 10 mm.
(Ans : X = , Y =)

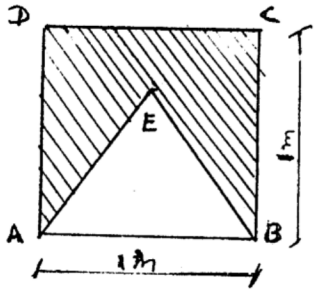
5. Calculate numerically centroid of the shaded area shown in Fig. (Ans: X = 54.79, Y = 36.61)



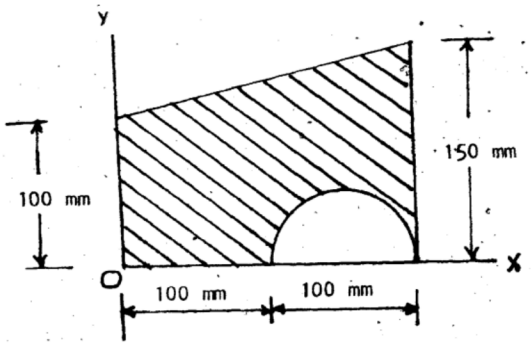
6. Determine the distance 'h'or which the centroid of the shaded area is as high above line AA as possible. Show that if the distance y of C.G. is maximum, 'y = h Shown in Figure. (Ans : h = 612.57)



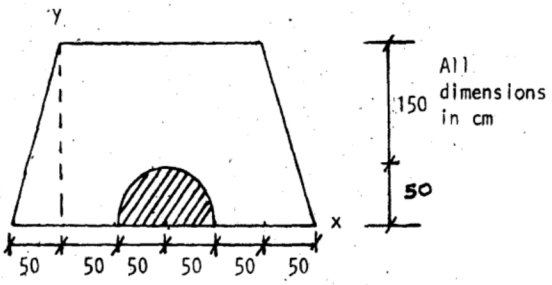
7. An isosceles triangle is to be cut from one edge of a square plate of side 1 m, such that the remaining part of the plate remains in equilibrium in any position, when suspended from the apex of the triangle. Find the area of the triangle to be removed. (Ans : 0.317 m²)



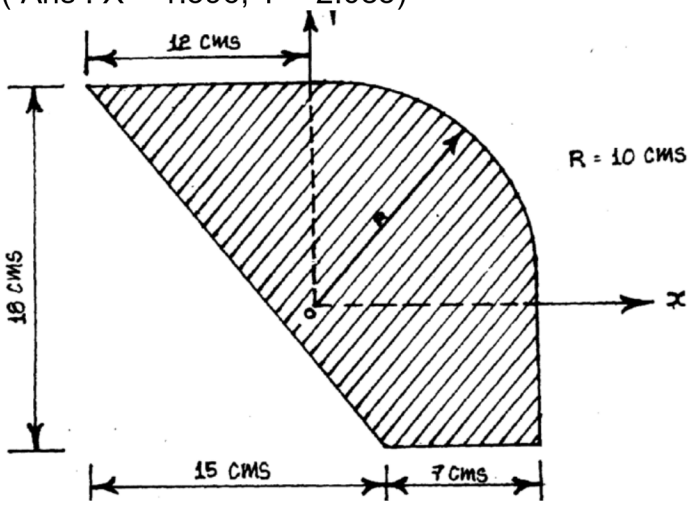
8. A semicircular area is removed from a trapezoid as shown in Fig. Determine the centroid of the remaining area. (Ans : X = 98.59, Y = 71.18)



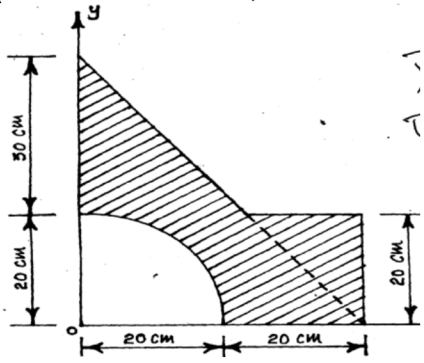
9. Locate the centroid fo the cross section shown in Fig. (Ans : Y = 99.48)



10. Determine the position of the centroid of the plane shaded area shown in figure.
(Ans : X = 1.596, Y = 2.085)

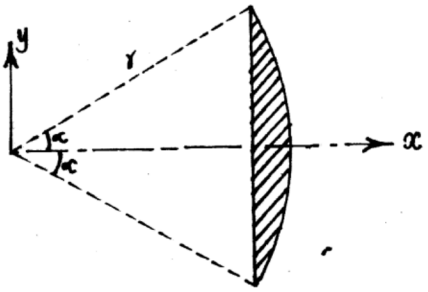


11. Determine the co-ordinate of centroid of the shaded portion shown in figure.
(Ans : X = 19.164, Y = 19.0731)

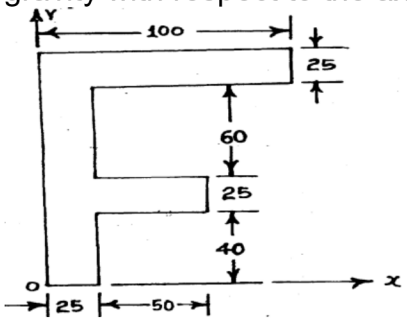


12. Determine the x—co-ordinate of the centroid of the portion of a circular segment in terms of radius r and angle α (For shaded area only).

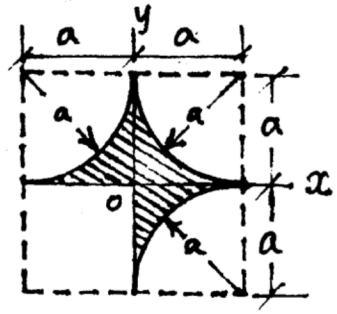
(Ans : X = $\frac{2r\sin^3\alpha}{3(\alpha - \sin\alpha\cos\alpha)}$)



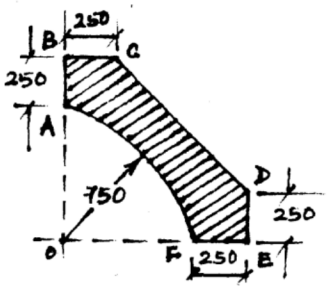
13. A plane lamina of uniform thickness resembles like a letter 'F'. Locate its centre of gravity with respect to the axes X and Y as shown. (Ans : X = 33, Y = 88)



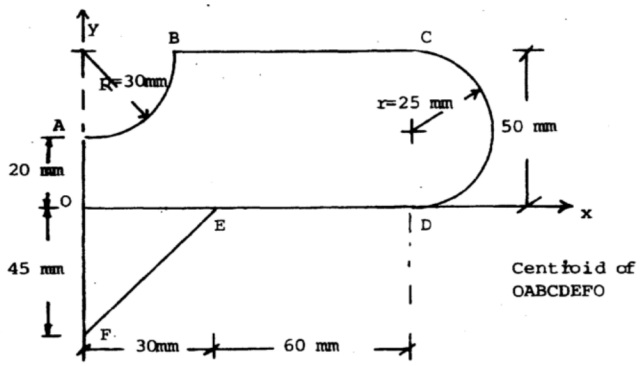
14. Locate the centroid of the shaded area in figure with respect to the co-ordinate axes as shown. (Ans : X = Y = 0.07446 a)



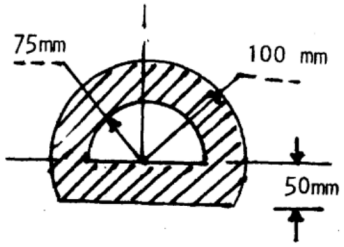
15. Find the centroid of the shaded area shown in the figure. Please note that OAF, is the quarter part of a circle of radius 750. (Ans : X = Y = 536)



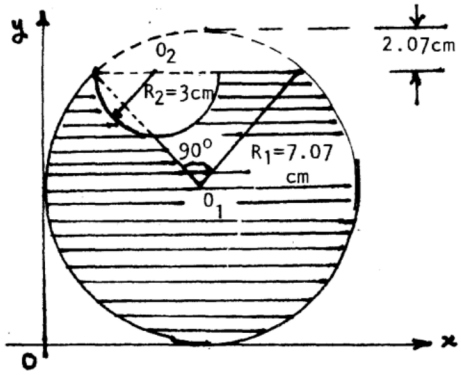
16. Determine the C.G of the following plane area shown in fig. (Ans : X = 54.86, Y = 18.46)



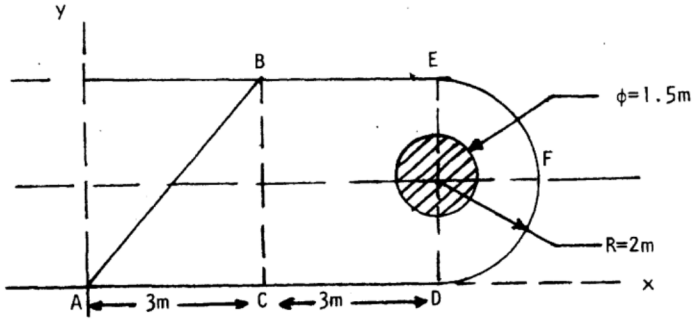
17. A hollow semi-circular section is as shown in Sketch. Determine centroid of the Shaded portion. (Ans : Y = 9.233)



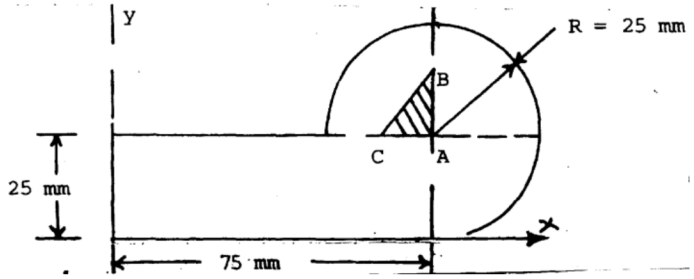
18. From a wooden disc of circular shape of radius 7.07 cm and of uniform thickness, the top part up to a depth of 2.07 cm is removed. Further, a semicircular portion of radius 3.0 cm is removed. Find the centre of gravity of the remaining part of the disc w.r.t. the axes x and y. (Ans : X = 7.29 , Y = 6.02)



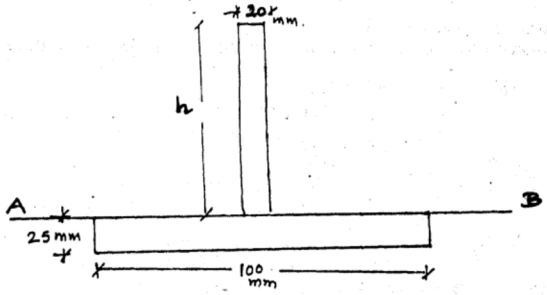
19. Three plates ABC, BCDE and DEF are welded together as shown in the figure. Circle of diameter 1.5 meter is cut from the composite plate. Determine the centroid of the remaining area. (Ans : X = 4.37 , Y = 1.82)



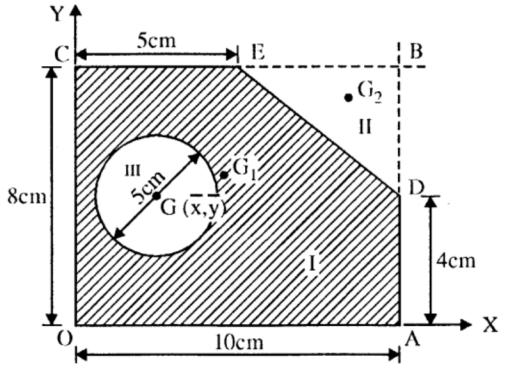
20. A triangle ABC where AB = AC = 15mm is cut from a plane surface shown in Fig. Determine the centroid of the remaining area. (Ans : X = 55.05, Y = 19.19)



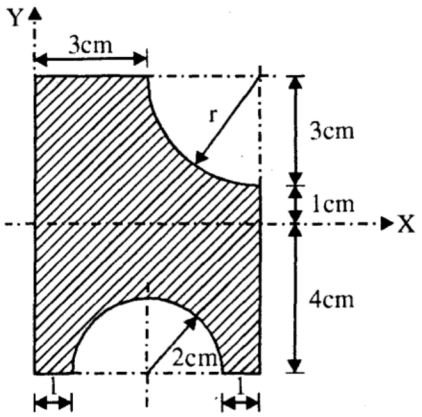
22. Determine depth of web of Tee-section, such that centroid of section coincides with AB axis. (Ans : h = 55.91)



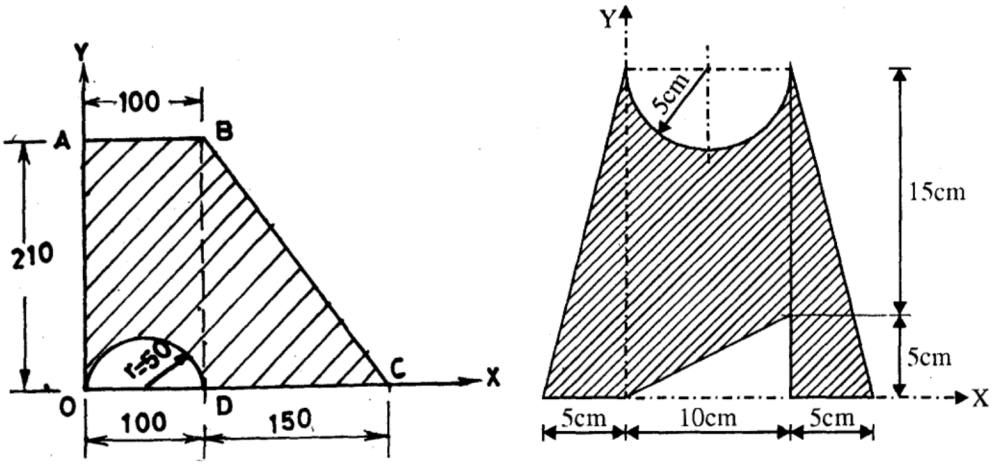
23. Find out the co—ordinates of the center of 5 cm diameter circular hole cut in a plane lamina so that this point will be the center of gravity of the remaining shaded area.
(Ans : X = 4.524, Y = 3.619)



24. Determine the centroid for the shaded area as shown in figure. (Ans : X = 2.64, Y = 0.01)

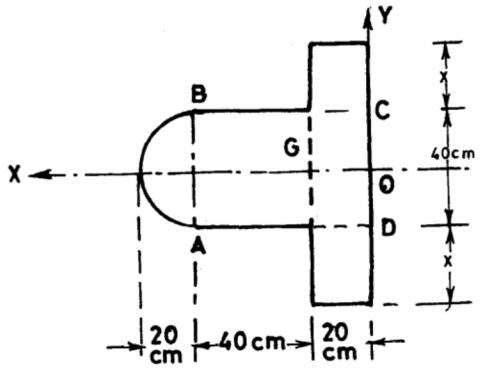


25. Determine the centroid for the shaded area as shown in figure. (Ans : X = 4.823, Y = 8.16)

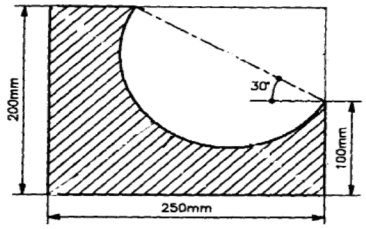


26. Find the centroid of shaded area shown in Fig. (Ans : X = 97.985, Y = 98.229)

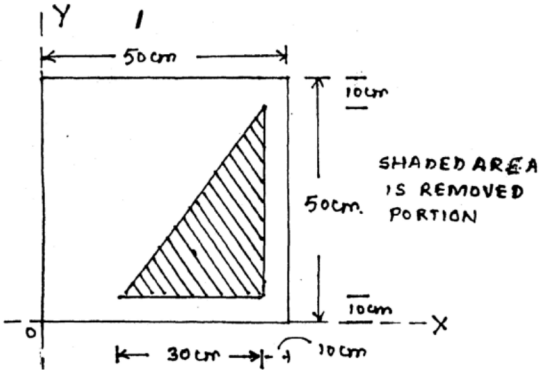
27. Find the value of x so that the centre of gravity of the uniform lamina shown in fig. remains at the centre of the rectangle ABCD. (Ans : x = 30.229)



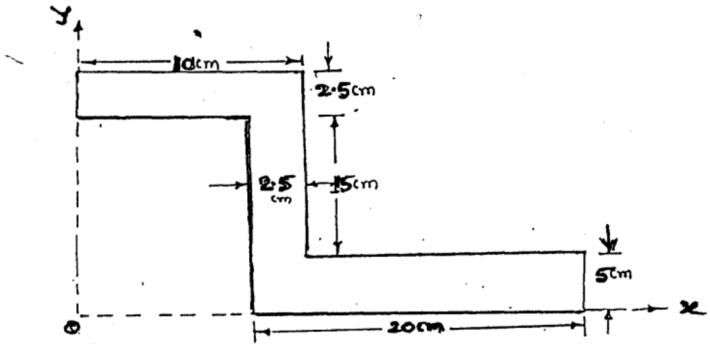
28. Find the centroid of the shaded area as shown in Fig. (Ans : X = 91.741, Y = 69.354)



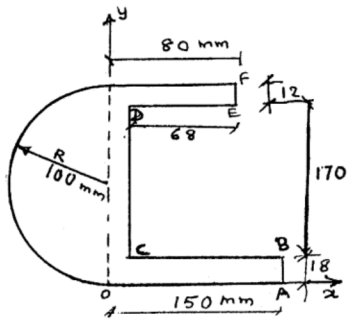
29. Find C.G. (Ans : X = 23.9, Y = 26.1)



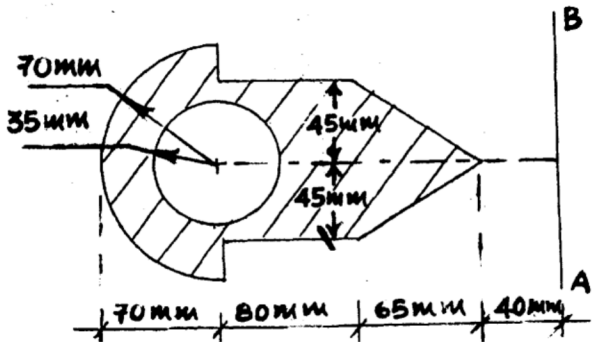
30. Find the centroid of the shaded area as shown in Fig (Ans : X = 13.55, Y = 10.4,)



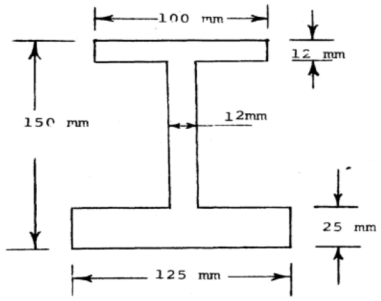
31. Find the centroid of the shaded area as shown in Fig. (Ans : X = - 19.33, Y = 93.02,)



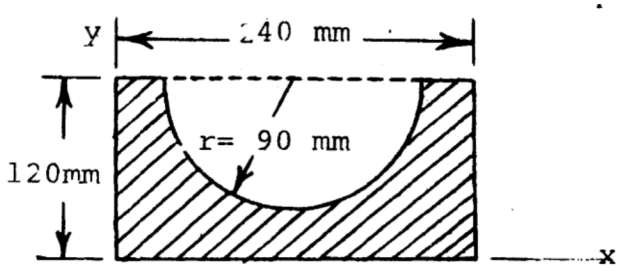
32. Find the centroid of the shaded area as shown in Fig.
(Ans)



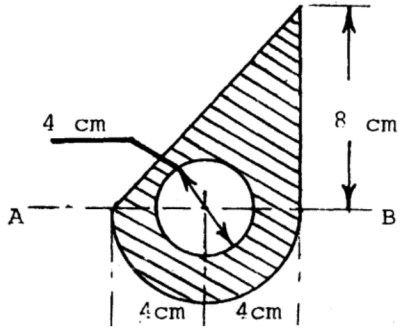
33. Find the centroid of the shaded area as shown in Fig (Ans : Y = 56.75)



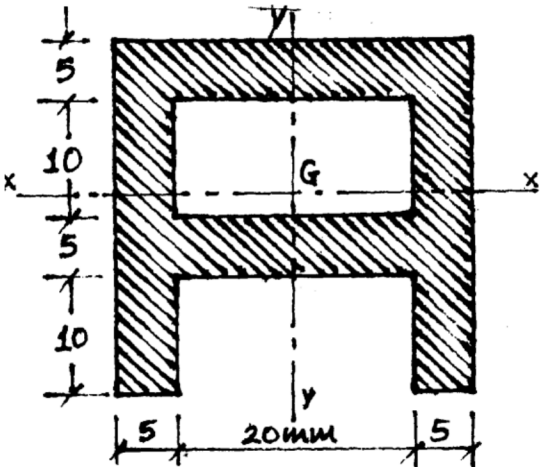
34. Find the centroid of the shaded area as shown in Fig.(Ans: Y = 42.74,)



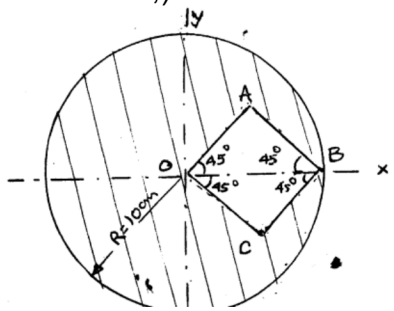
35 Find the centroid of the shaded area as shown in Fig. (Ans : Y = 0.96,)



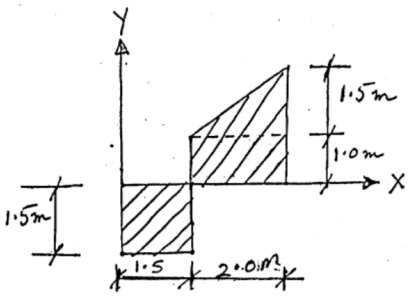
36. Find the centroid of the shaded area as shown in Fig (Ans : Y = 34,)



37. Find the C.G. of the section shown in the figure. Take OA = OC and OB = 10 cm.(Ans : X = - 0.946,)



38. Find C.G. of the section shown in the figure. (Ans : X = 1.9, Y = 1.77,)



39. Find the centroid of the shaded area as shown in Fig