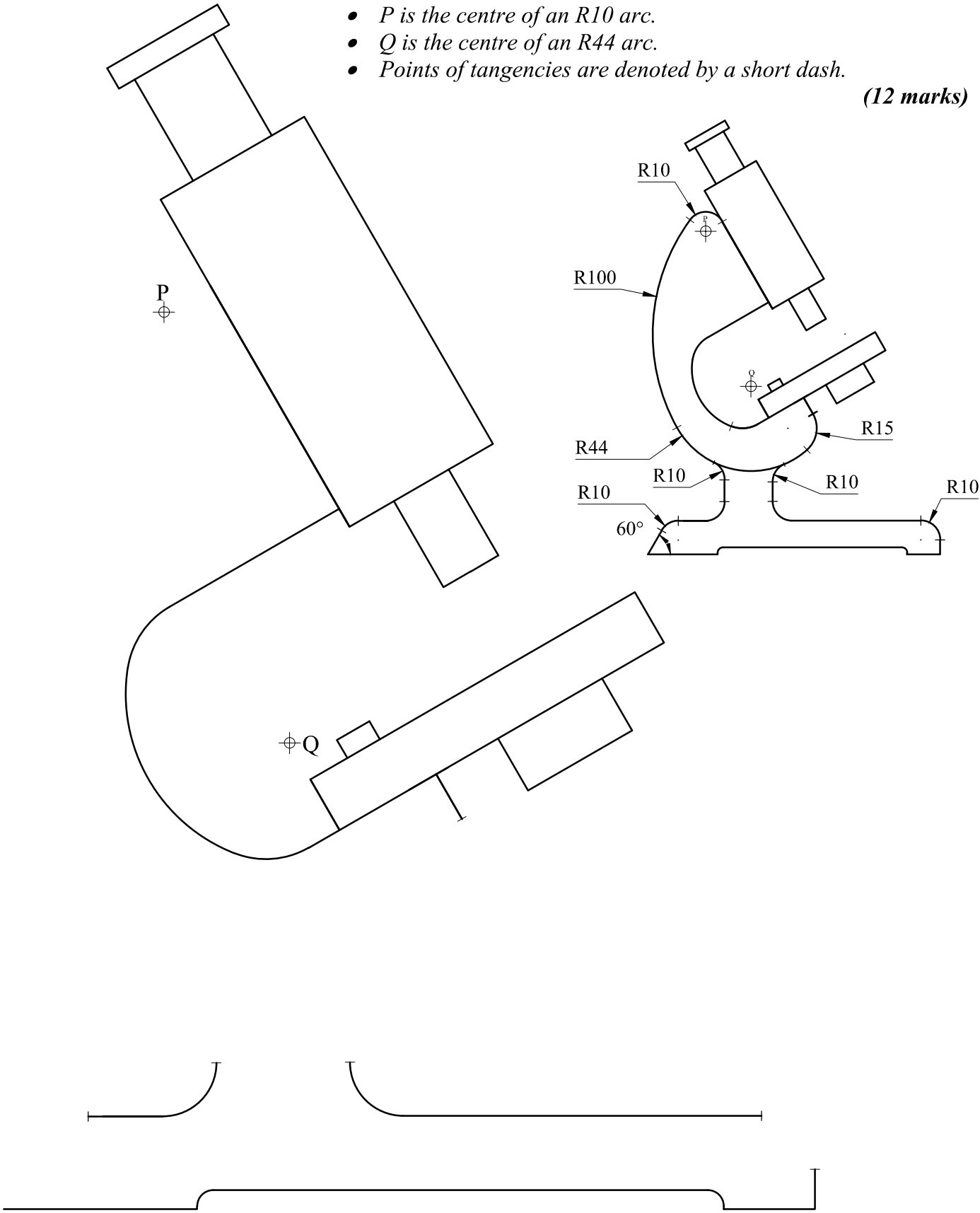


Question 1.
A dimensioned side view of a forensic microscope is shown. An incomplete profile of the microscope is given below. Using the given start lines and dimensions, complete the missing lines and arcs showing clearly all constructions necessary to locate the centres and the points of tangencies.

- Notes:
- *P is the centre of an R10 arc.*
 - *Q is the centre of an R44 arc.*
 - *Points of tangencies are denoted by a short dash.*

(12 marks)

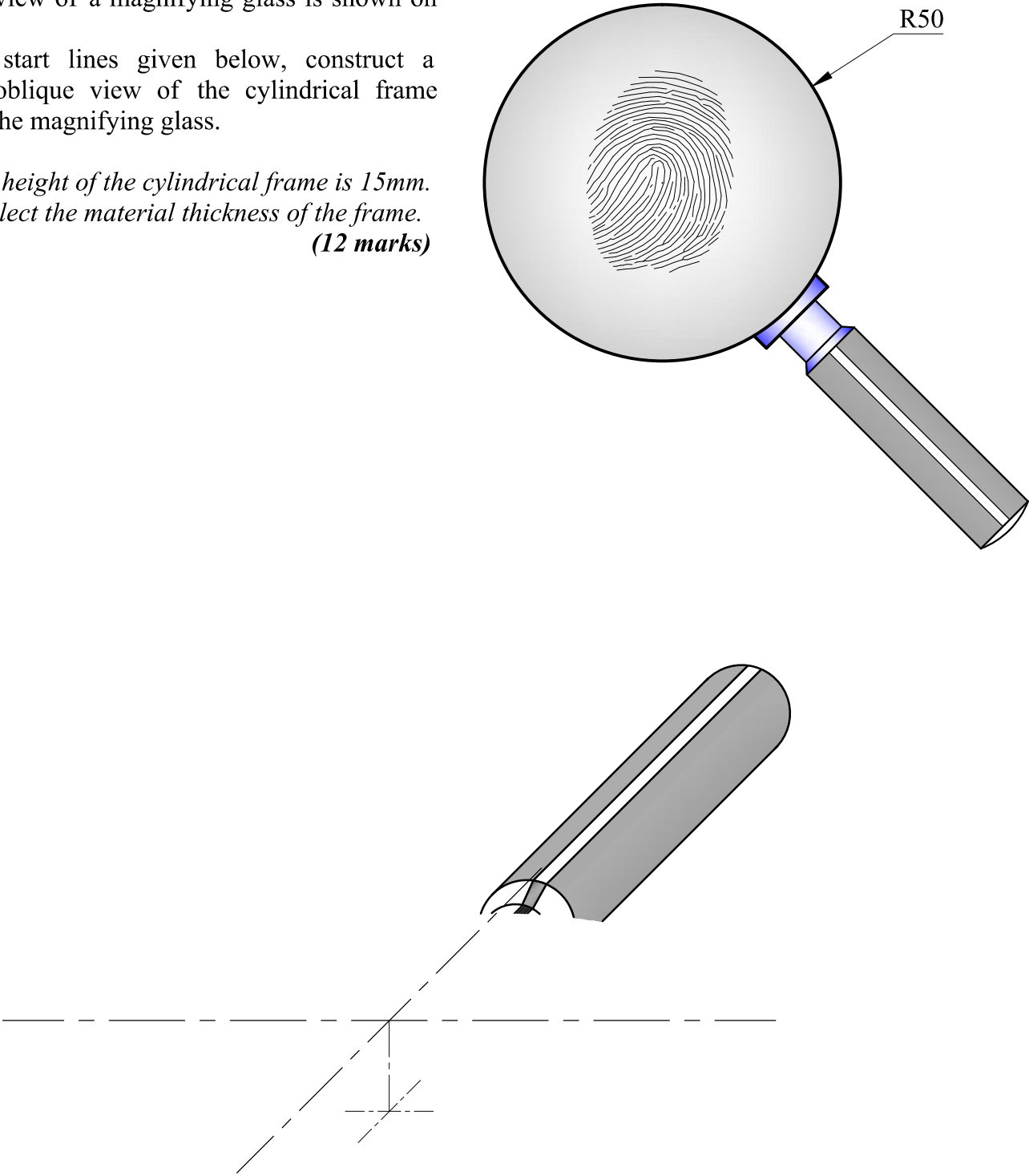


Question 2.
A plan view of a magnifying glass is shown on the right.

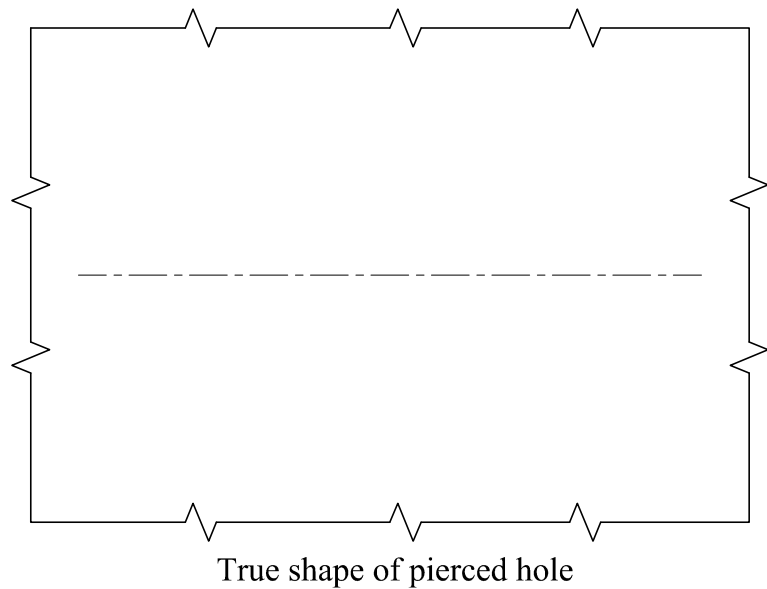
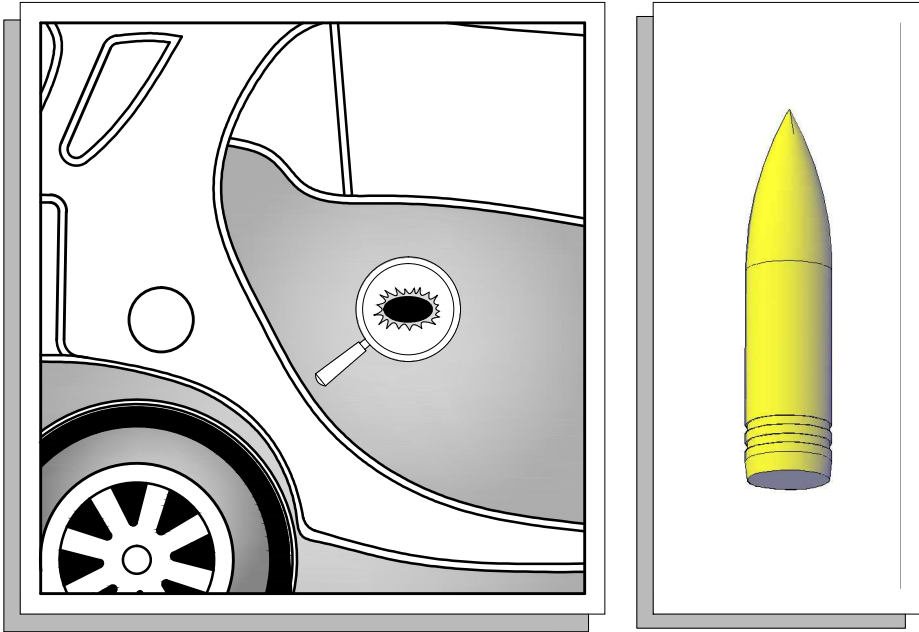
On the start lines given below, construct a cabinet oblique view of the cylindrical frame without the magnifying glass.

- Notes:
- *The height of the cylindrical frame is 15mm.*
 - *Neglect the material thickness of the frame.*

(12 marks)

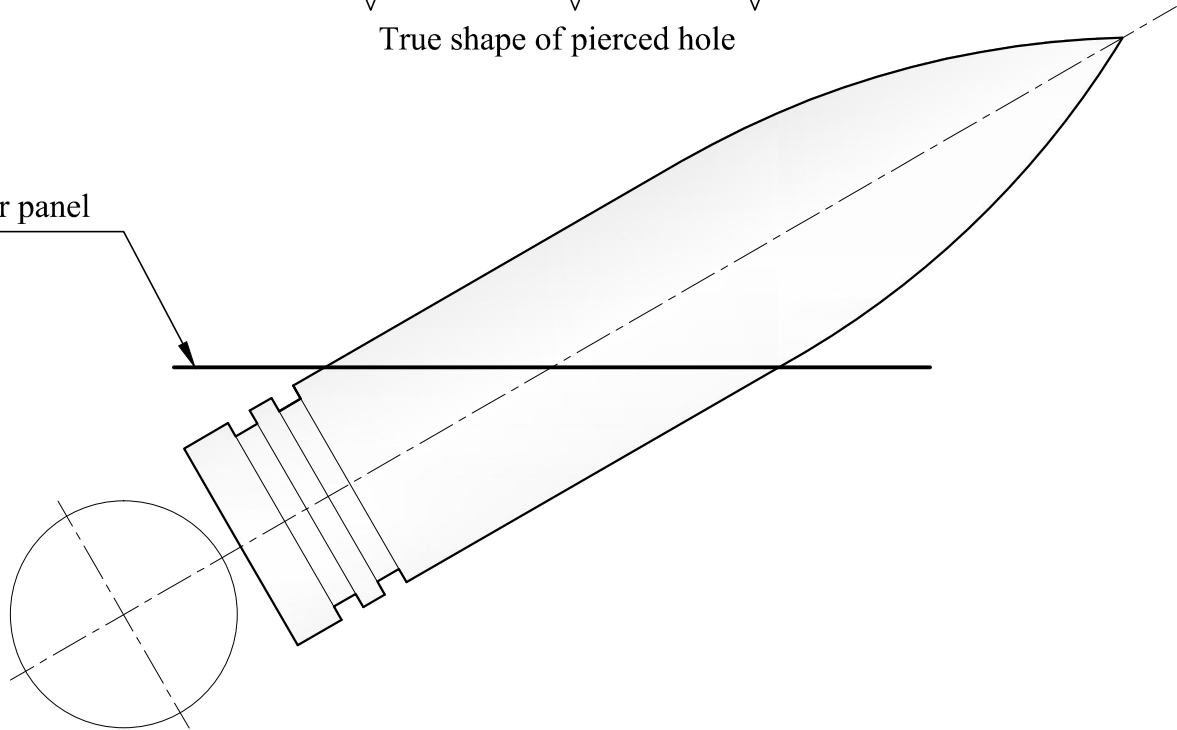


Question 3.
The door of a car was hit by a bullet as shown in the given figures. Since the pierced hole was **elliptical**, the forensic experts could determine the angle of penetration and hence the location from where it was fired.
Enlarged views of the bullet penetrating the door panel are given below. In the space provided construct / project the **elliptical shape of the hole** made by the bullet.
Leave all constructions visible.
(12 marks)

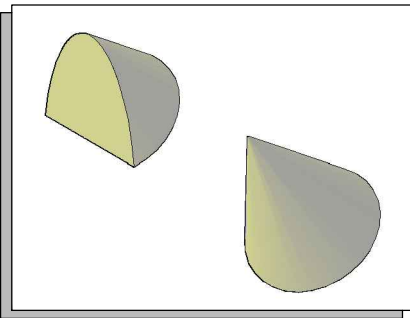
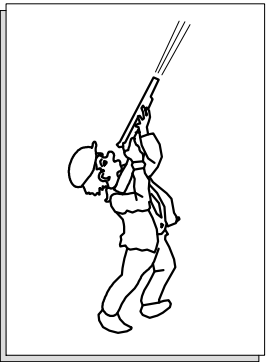


True shape of pierced hole

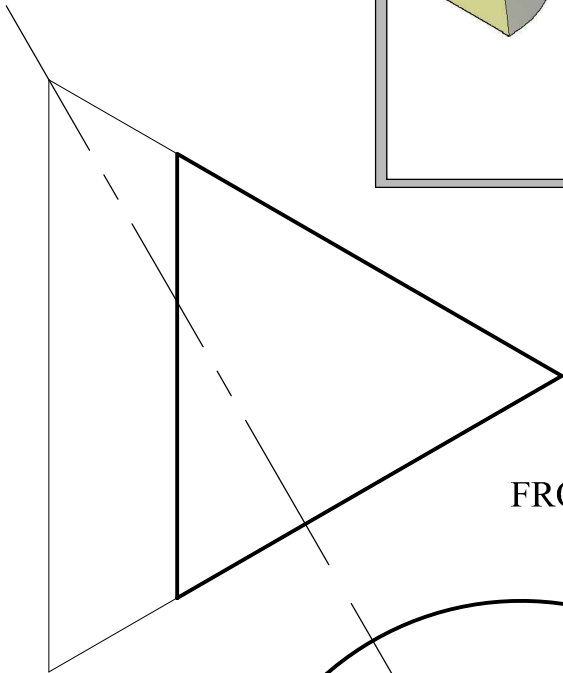
Car door panel



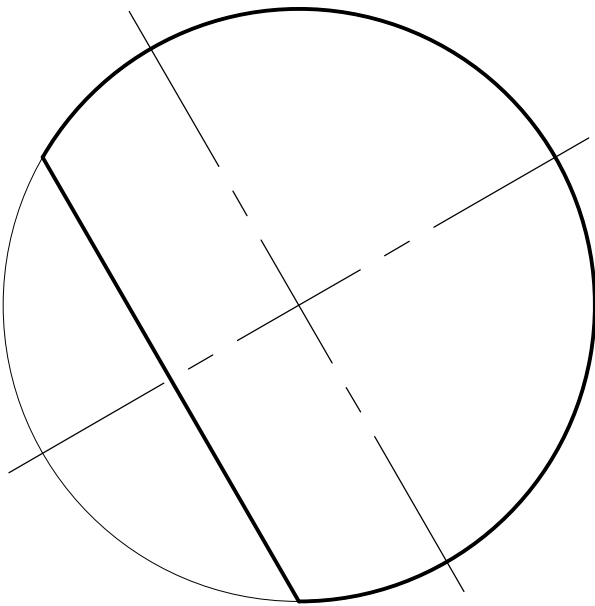
Question 4.
A bullet fired into the air can result in random injury if a person is hit by the falling bullet. The locus of a fired bullet takes the shape of a parabola. Two pictorial views, a front elevation and an incomplete auxiliary plan of an inclined cut cone, are given below. Using the given start lines:
a. Complete the auxiliary plan.
b. Project the **true shape of cut** thus tracing the parabolic path of the bullet.
Note: The lower left-hand point of the parabola is given.
(12 marks)



PARABOLA



FRONT



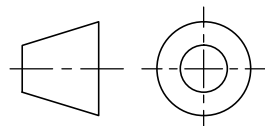
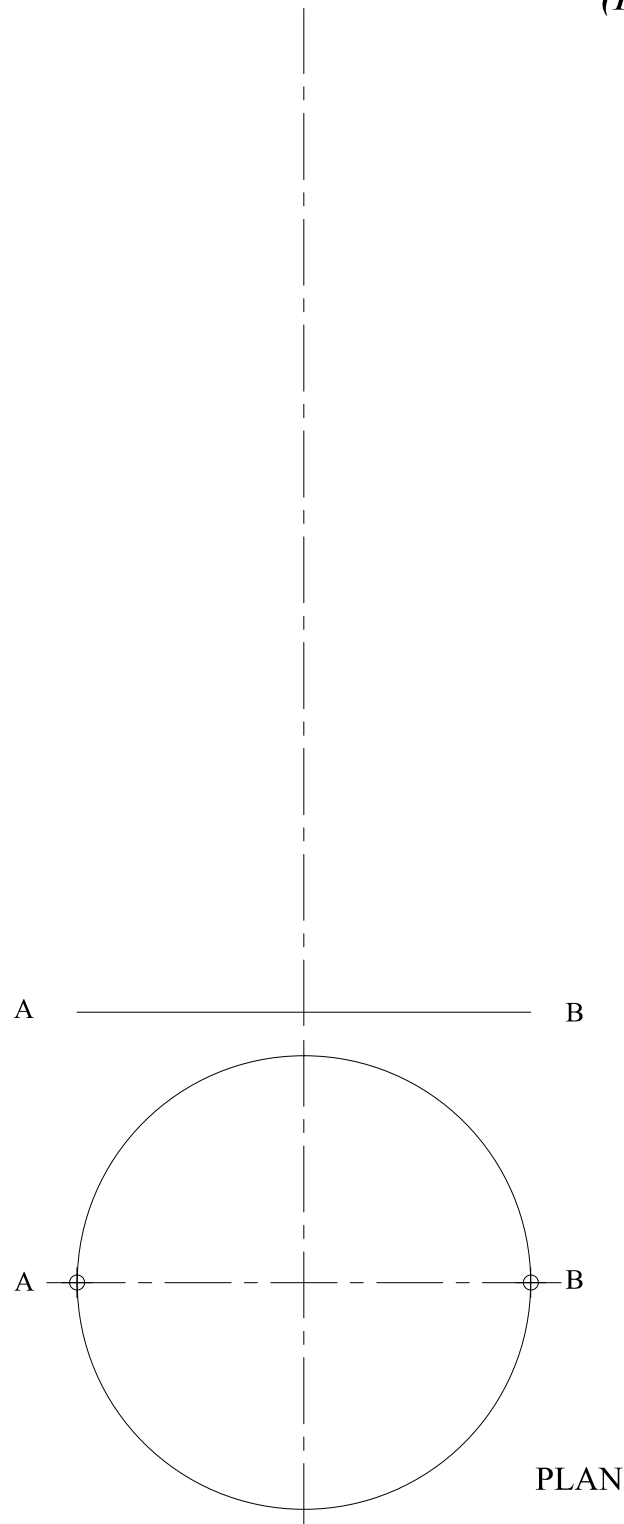
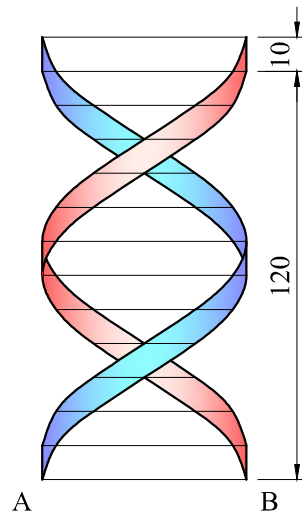
AUXILIARY PLAN

Question 5.
 The logo of a DNA testing laboratory shown on the right consists of a simplified version of a DNA molecule which is made up of two single turn helical ribbons A and B starting and ending from opposite sides. The pitch of the helices is 120mm and the width of the ribbons is 10mm. Using the given start lines:

- Construct the two helical ribbons.
- Colour and shade ribbon A.

Leave all construction lines visible.

(14 marks)

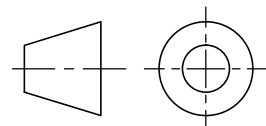
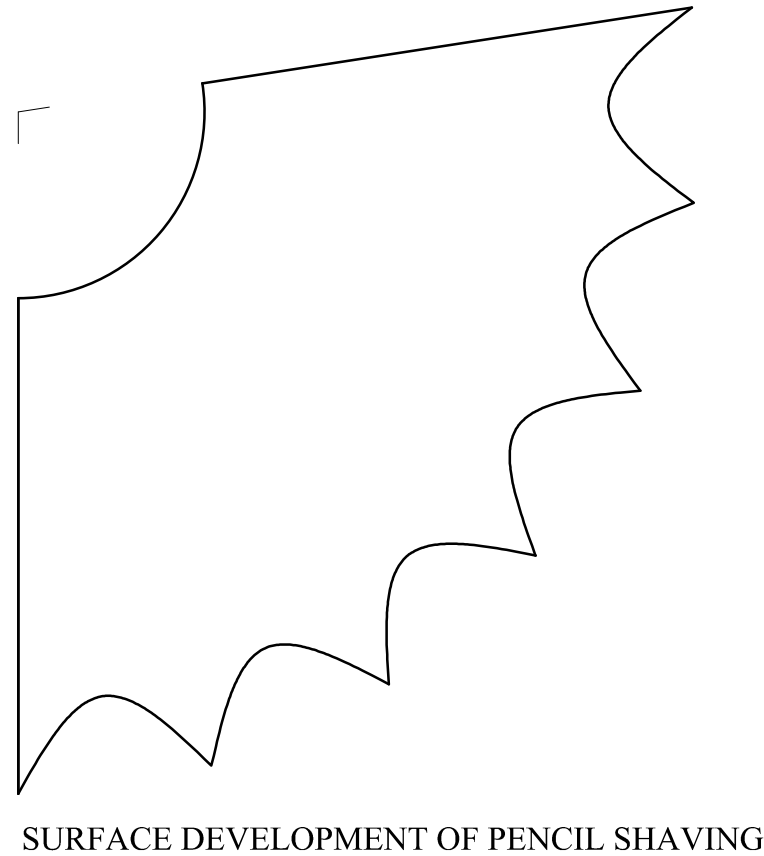
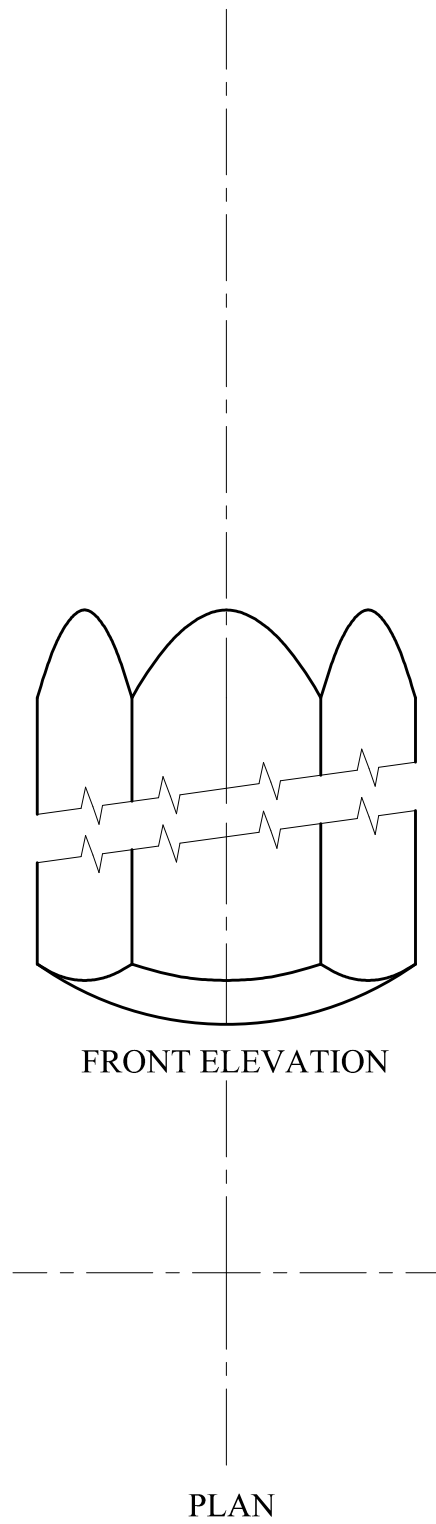
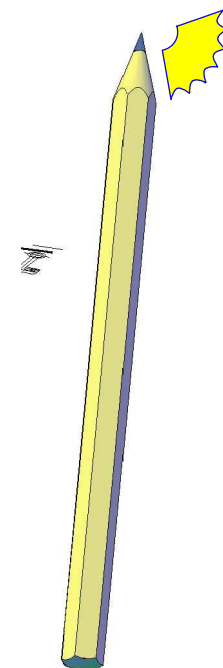


Question 6.
 A pictorial view of a sharpened hexagonal prismatic pencil is shown on the right. An incomplete front elevation of the pencil and a shaving of the sharpened pencil are given below. Using the given start lines and the information collected from the shaving :

- Complete the front elevation by constructing the conical top including the graphite tip.
- Project / construct the hexagonal shape of the pencil and complete the plan.

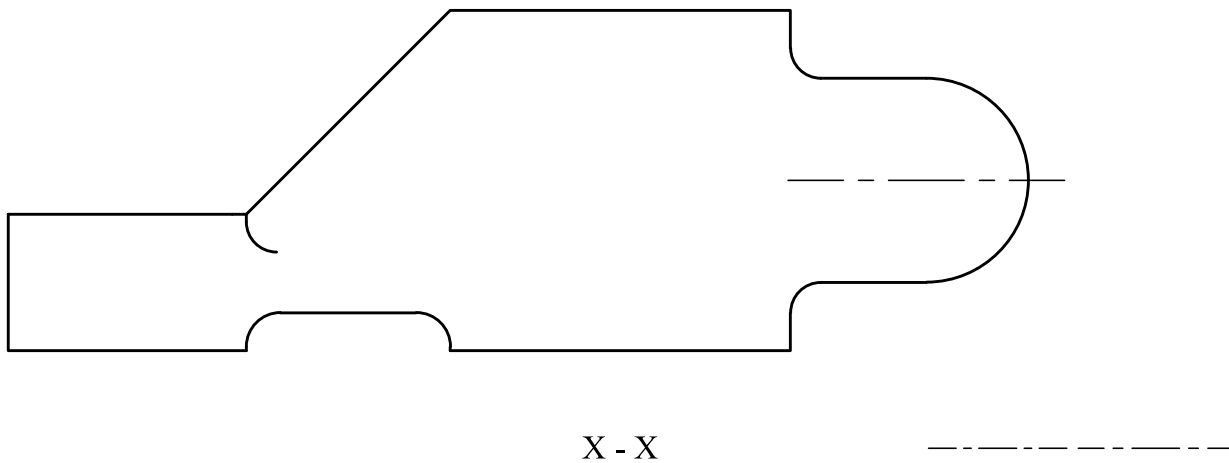
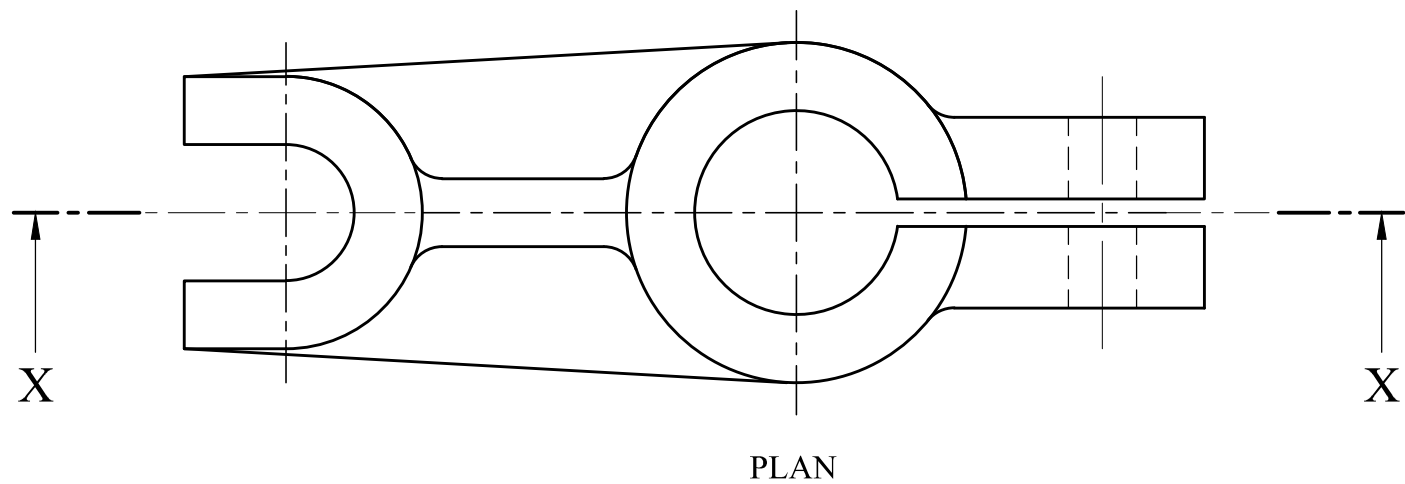
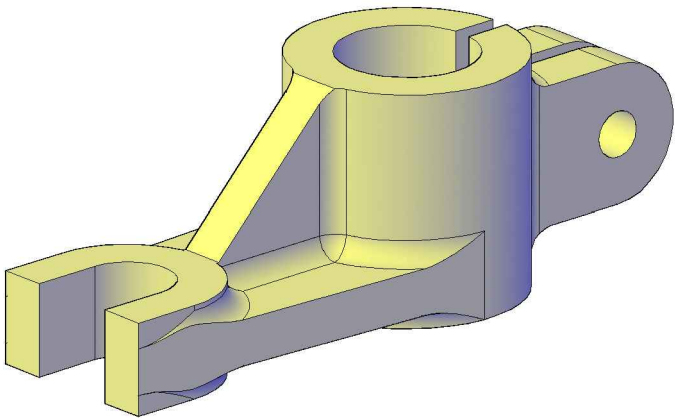
Leave all construction lines visible.

(12 marks)



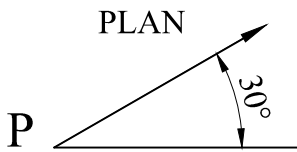
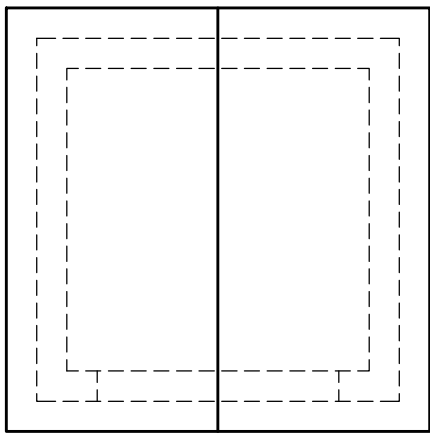
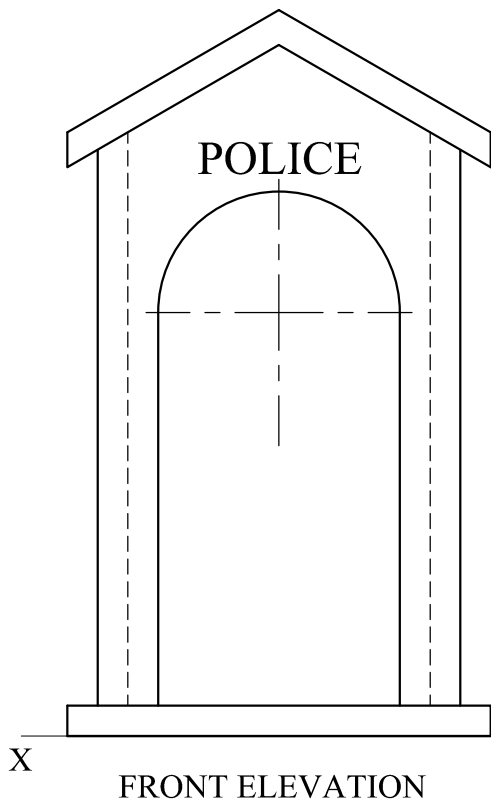
Question 7.
 A 3-D view of a cast iron microscope component is shown on the right.
 An incomplete front view and a plan are given below.
 In the space provided:
 a) complete the Sectional Front X-X,
 b) draw the symbol of the projection used.

Note: Do not show any hidden detail.
 (10 marks)



PROJECTION SYMBOL

Question 8.
 A front elevation and a plan of a Police Sentry are given below. Using the given start lines, project an auxiliary front view as seen from the direction of arrow P. Do not show any hidden detail.
 (16 marks)



AUXILIARY VIEW

