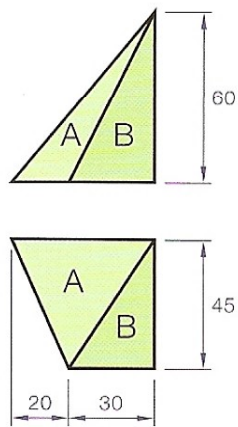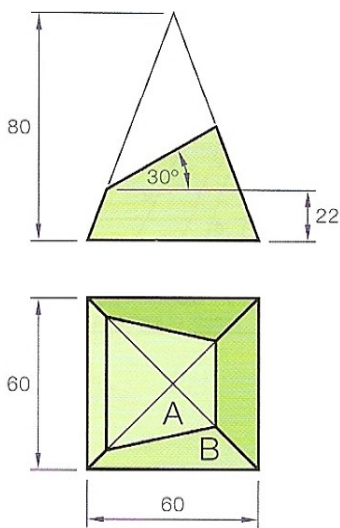# Activities

DIHEDRAL ANGLE
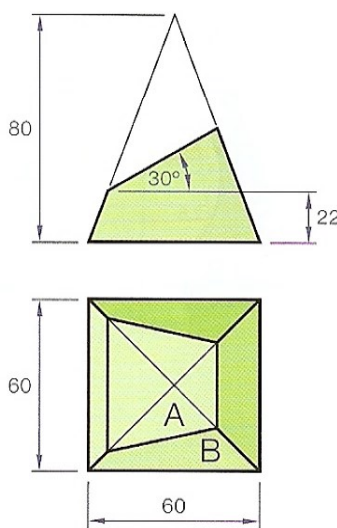

Fig. 20.67

Fig. 20.68

Fig. 20.69

Q1. to Q3.
For each of the following draw the given plan and elevation of the solids and determine the dihedral angle between surfaces A and B using the point view method.

Q4. to Q8.
For each of the following roof structures draw the given views. Determine the dihedral angle between surfaces A and B using the triangle method.
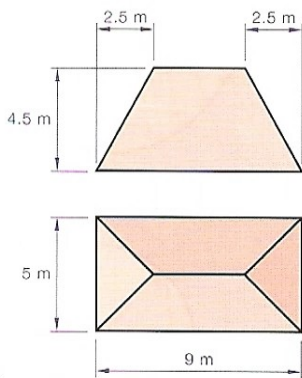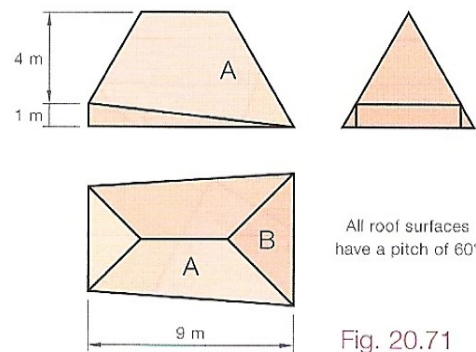Scale 1:100

Fig. 20.70

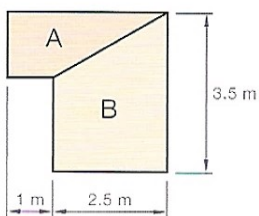All roof surfaces have a pitch of 60°

Fig. 20.71

A = Pitch of 60°
B = Pitch of 45°

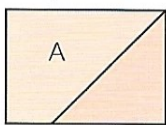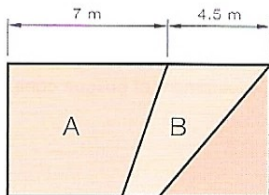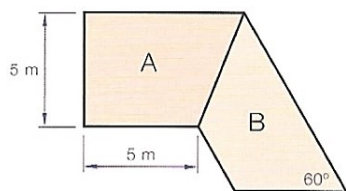Fig. 20.72

Surface A has a pitch of 50°
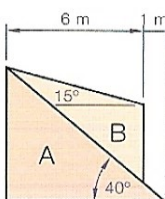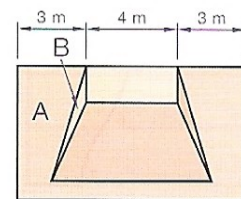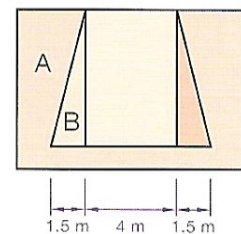
Fig. 20.73

Fig. 20.74

ROOF GEOMETRY

Q9. Fig. 20.75 shows the plan and elevation of a lean-to roof. Surface A has a pitch of 30°, surface B has a pitch of 45° and surface C has a pitch of 60°.
(i)   Draw the plan and elevation of the roof.
(ii) Develop the surfaces A and B.
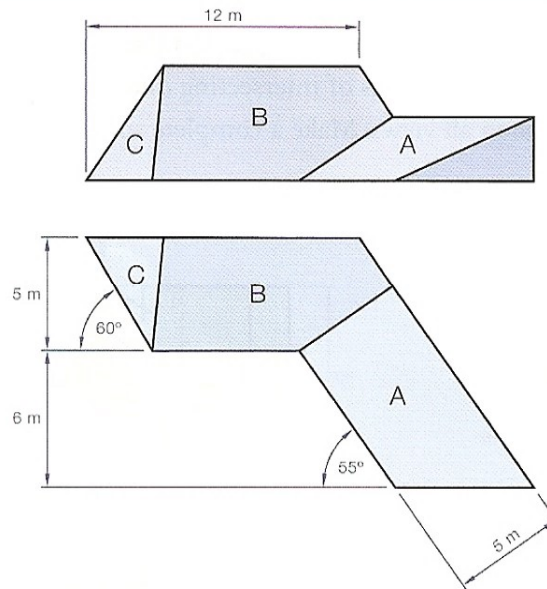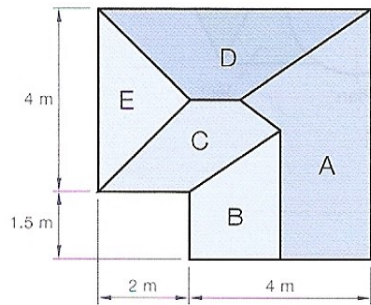(iii) Find the dihedral angle between the surfaces A and B.

Scale 1:100

Fig. 20.75

Q10. Fig. 20.76 shows the outline plan of a pitch roof. The surfaces A and B have a pitch of 50°. Surfaces C, D and E have pitches of 50°.
(i)   Draw the given plan and project an elevation.
(ii) Develop the surfaces A and C.
(iii) Determine the dihedral angle between surfaces A and D and between surfaces B and C.

Scale 1:50

Fig. 20.76

Q11. Fig. 20.77 shows the outline plan of a lean-to roof. Surfaces A and B have a pitch of 45°. Surface C has a pitch of 25°.
(i)   Draw the plan and elevation of the roof.
(ii) Find the dihedral angle between surfaces B and C.
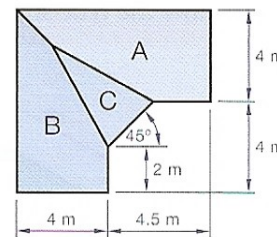(iii) Develop surfaces A and C.

Scale 1:100

Fig. 20.77

Q12. Fig. 20.78 shows the plan and elevation of a lean-to roof with a dormer window and a quarter tower. Surface A has a pitch of 35°. Surfaces B and C have a pitch of 30°.
(i)   Draw the plan and elevation of the roof.
(ii) Find the dihedral angle between surfaces A and B.
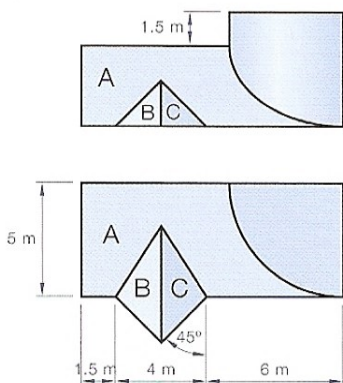(iii) Develop the surface of roof A.

Scale 1:100

Fig. 20.78

INTERSECTING DUCTS AND PIPES

Q13. to Q15.

The diagrams show the projections of intersecting ducts/pipes. In each case draw the given views and find the joint line in all views. Make a complete surface development of each ducting piece.
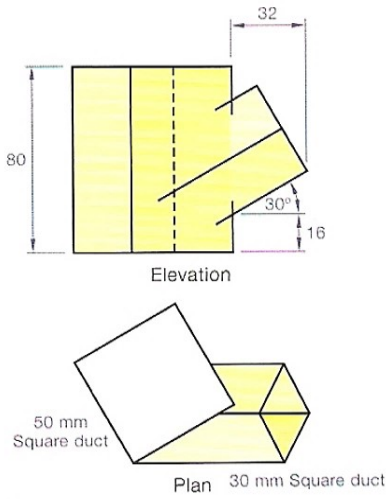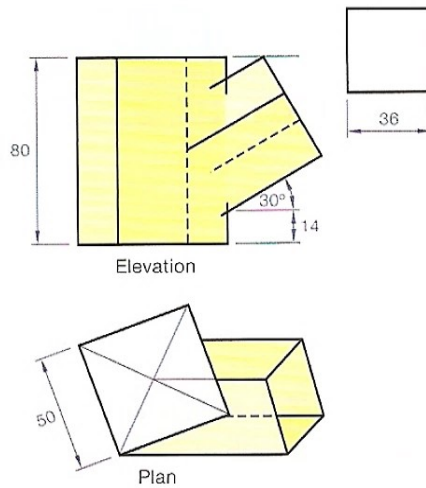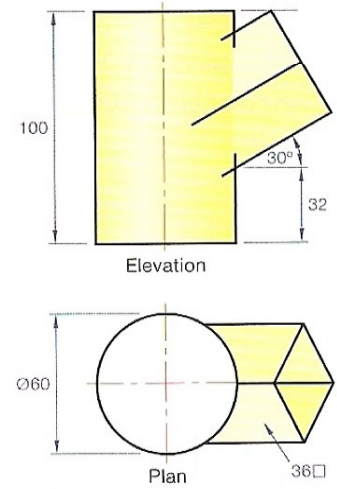

Fig. 20.79

Fig. 20.80

Fig. 20.81

Q16. to Q18.

The diagrams show end views of intersecting ducts/pipes. In each case draw the front elevation, end elevation and plan showing the joint line clearly. Develop the surface of part A and enough of the larger duct to show the true shape of the hole to be cut in it.
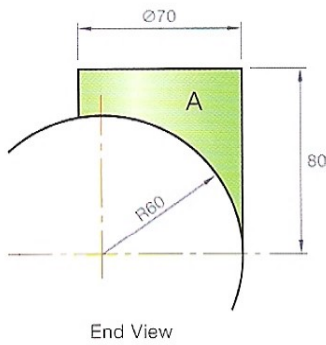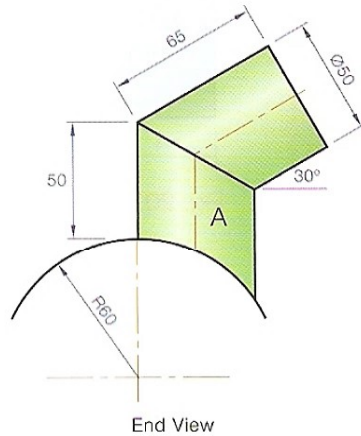

End View

Fig. 20.82

End View
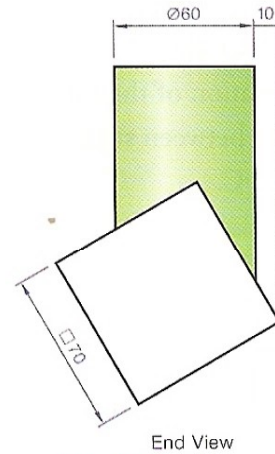
Fig. 20.83

End View

Fig. 20.84

Q19. to Q21.

The diagrams show pipe joints. Draw the given views and find the joint line.
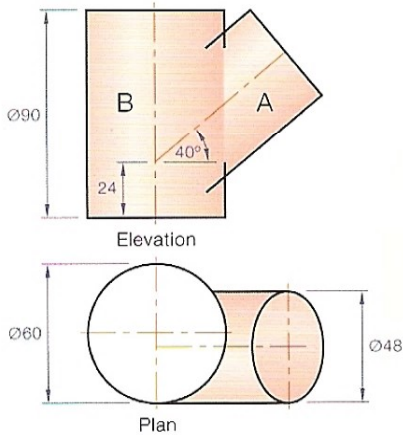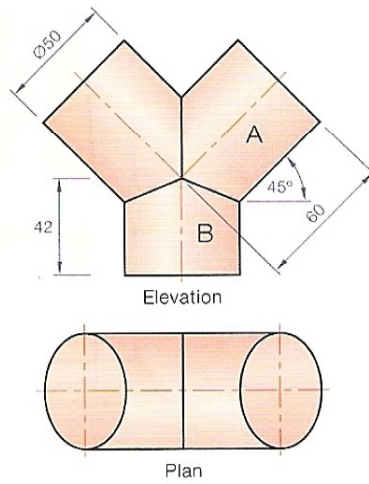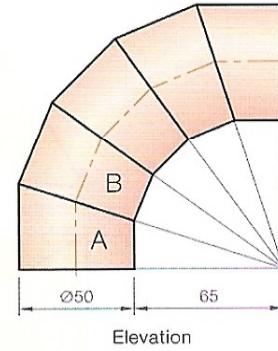Develop the surfaces of part A and part B.

Fig. 20.85

Fig. 20.86

Fig. 20.87

Q22. to Q24.

Given the plan and elevation of a hopper/funnel. Draw the given views
and make a complete surface development of the object.
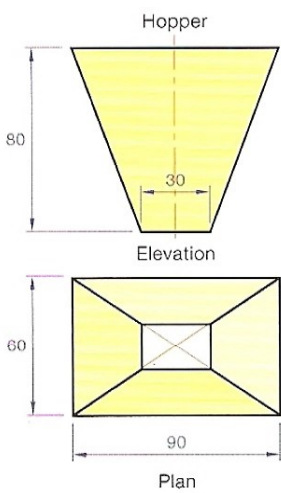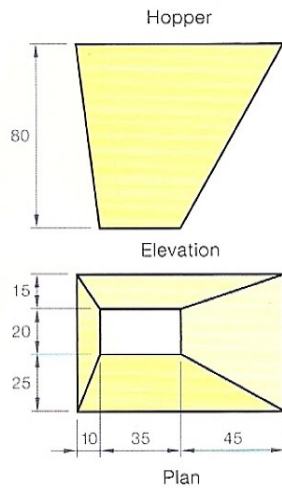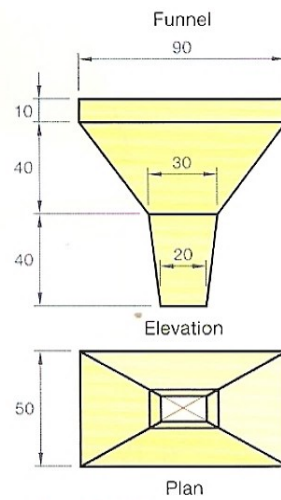

Fig. 20.88

Fig. 20.89

Fig. 20.90

Q25. to Q27.

Given the plan and elevation of transition pieces. In each case draw the given views and make a *one*-piece surface development of the object.
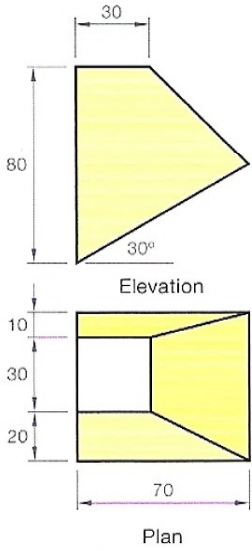

30

80

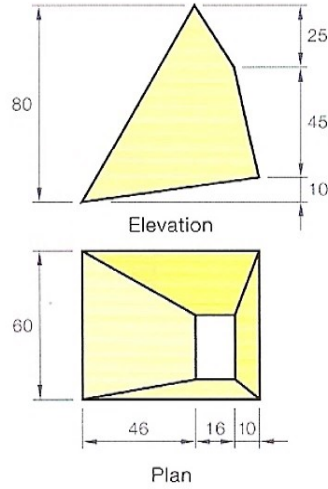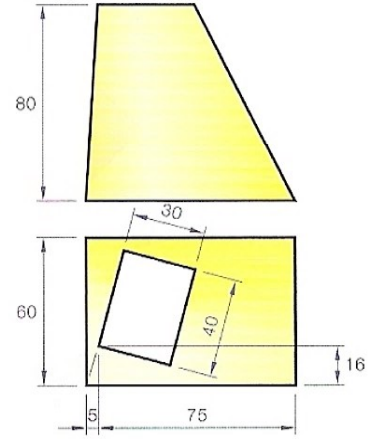80

30°

Elevation

10

30

20

70

Plan

Fig. 20.91

25

80

45

10

Elevation

60

46   16 10

Plan

Fig. 20.92

80

30

60

40

16

5   75

Fig. 20.93

Q28. to Q30.

Make a *one*-piece surface development of the following transition pieces.

80

30

60

40

16

5   75

Fig. 20.94

80

20

8

60

40

46   34

Fig. 20.95

Ø40

80

80

10
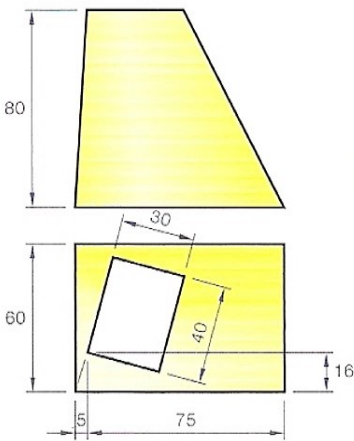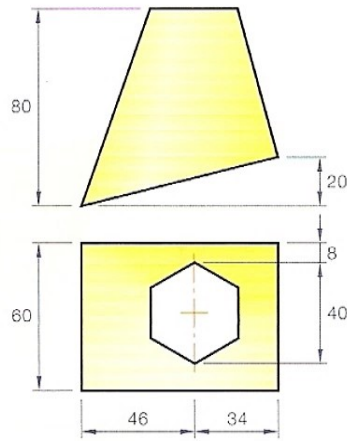
Ø80   45°
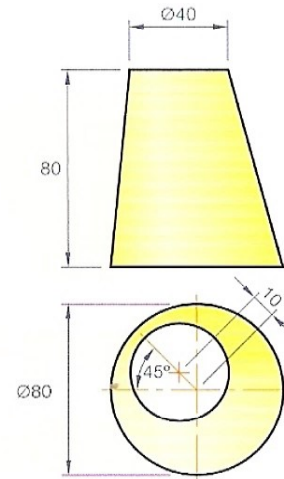
Fig. 20.96

Q31. to Q33.

Draw the given views and make a full surface development of the transition piece.

Ø50

60

Elevation

60

80

Plan

Fig. 20.97

95

30°

Elevation

24

Ø60

100

Plan

Fig. 20.98

35

60

Elevation

30

Ø36

30

40   60

Plan

Fig. 20.99
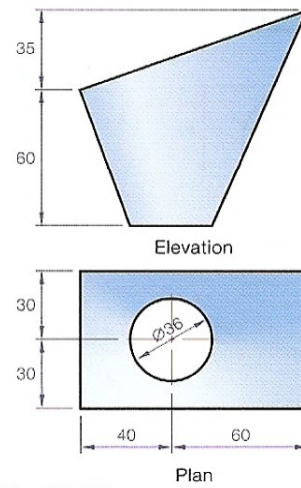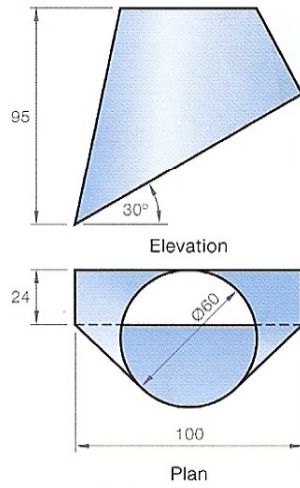
Q34. to Q36.

The following drawings show projections of transition pieces. Draw the given views and produce a one-piece development of each transition piece.
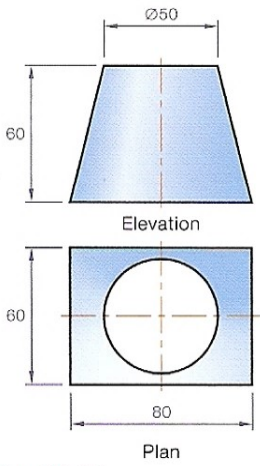
Ø50

60

30°

70

Front Elevation

32

80

110

Plan

Fig. 20.100

Ø40

Front Elevation

80

25   66

Plan

30

50

End View

Fig. 20.101

Ø40

70

60°

Front Elevation

Ø80

Plan

Fig. 20.102

75°

70

Elevation

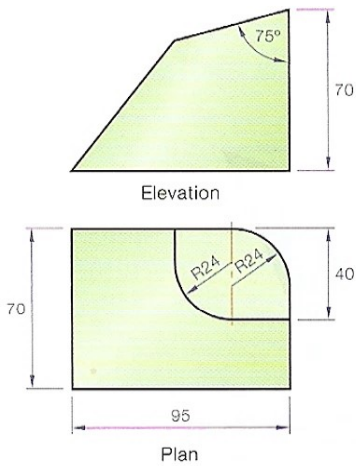R24 R24

70 40

70

95

Plan
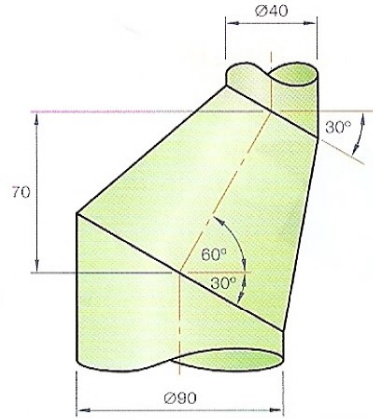
Fig. 20.103

Ø40

30°

70

60°

30°

Ø90
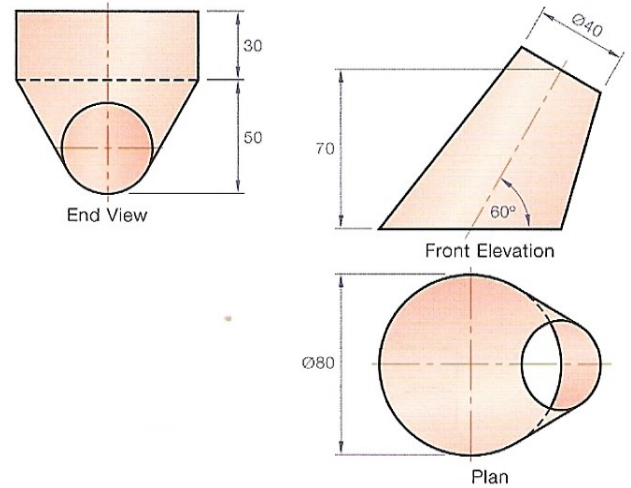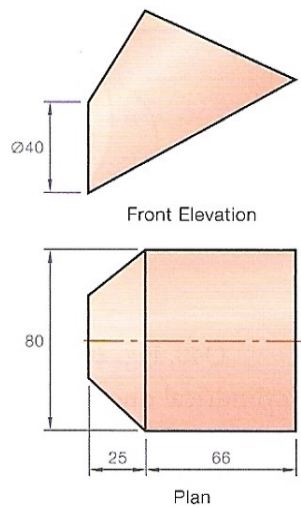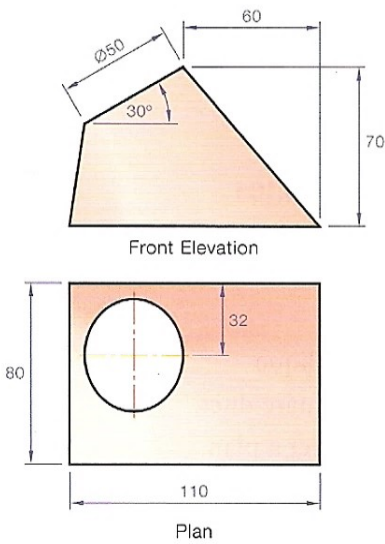
Fig. 20.104

Q37. and Q38.
Draw the given views and make a full one-piece development of each transition piece.

Q39. Fig. 20.105 shows a curved duct being joined by a straight, cylindrical duct.
(i)   Draw the plan and complete the elevation.
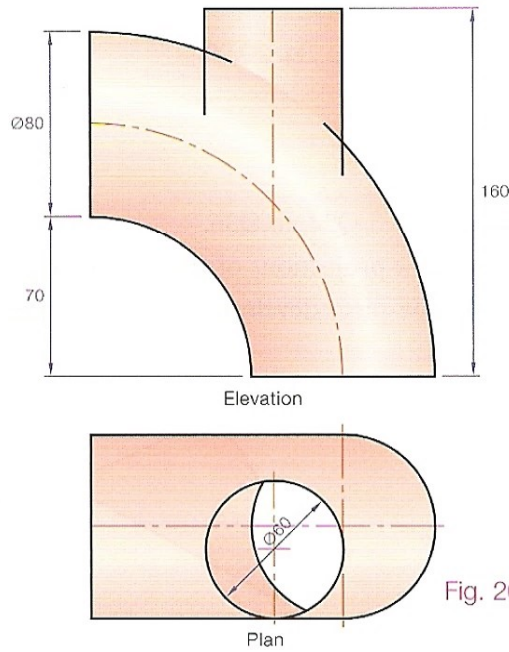(ii) Draw the complete surface development of the cylindrical duct.

Ø80

70

160

Elevation

Ø60

Plan
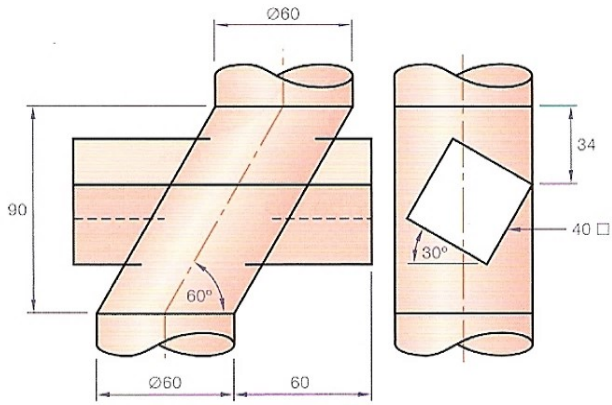
Fig. 20.105

Ø60

90

60°

Ø60 60

Fig. 20.106

34

40 □

30°

Q40. Fig. 20.106 shows an oblique cylindrical duct penetrated by a square duct.
(i)   Draw the given views and project a plan.
(ii) Find the joint line in all views.
(iii) Make a complete surface development of the square duct.
(iv) Make a complete surface development of the oblique cylindrical duct.