Allowed Tables and Charts: *(None)*

Read carefully the given data and solve all questions. (Total Marks: 120)

Question (1)   [20]

For the given trussed beam shown in **Fig. (1)**, Find the forces in the link members and then draw the **N.F., S.F. and B.M. diagrams on the beam abc.**
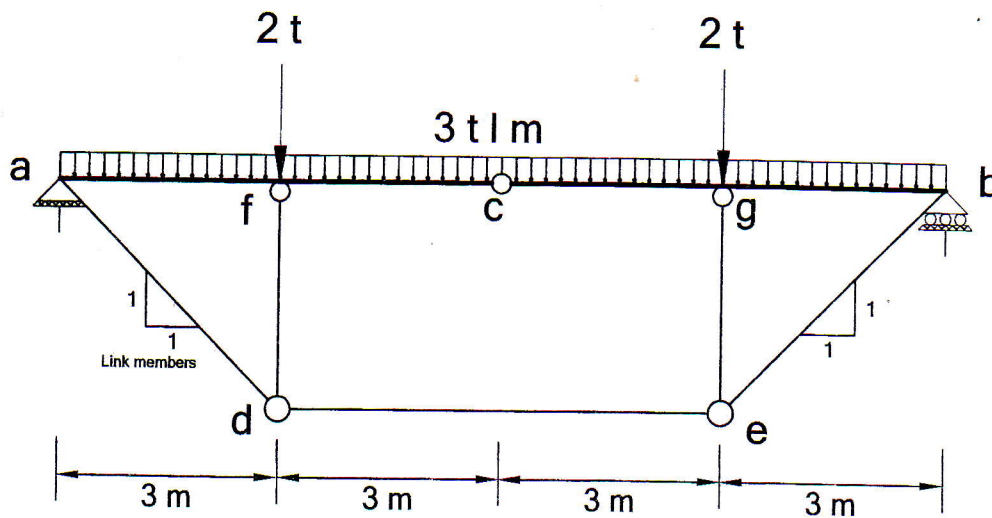

Fig. (1)

Question (2)   [25]

For the given compound beam shown in **Fig. (2)**, Draw the **N.F. , S.F. and B.M. diagrams.** Find also the Value of max . positive B.M. in span bc.
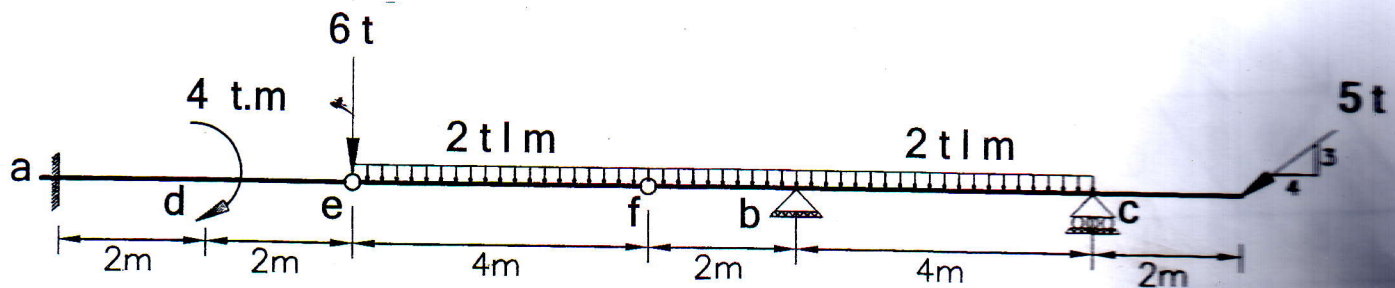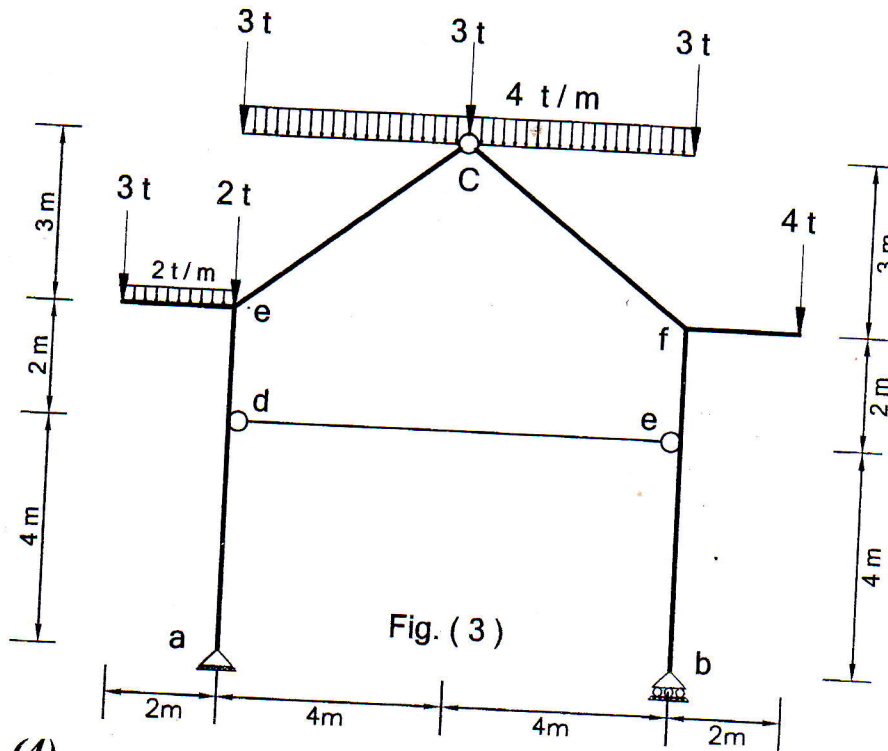

Fig. (2)

Question (3)

[35]

The frame shown in **Fig. (3)** is hinged at a and simply supported at b and it has intermediate hinge at c. Find the external reactions at a and b and the internal force in the tie de. Draw the **N.F., S.F. and B.M. diagrams.**

3 t   3 t   3 t

4 t / m

3 t   2 t   C   4 t

2 t / m   e   f

d   e

3 m   2 m   4 m

a   Fig. (3)   b

3 m   2 m   4 m

2m   4m   4m   2m

Question (4)

[25]

For the given truss shown in **Fig. (4)**, Find the forces in the marked members from 1 to 10 only. Put and write the results in the box table.

Question (5)

[15]

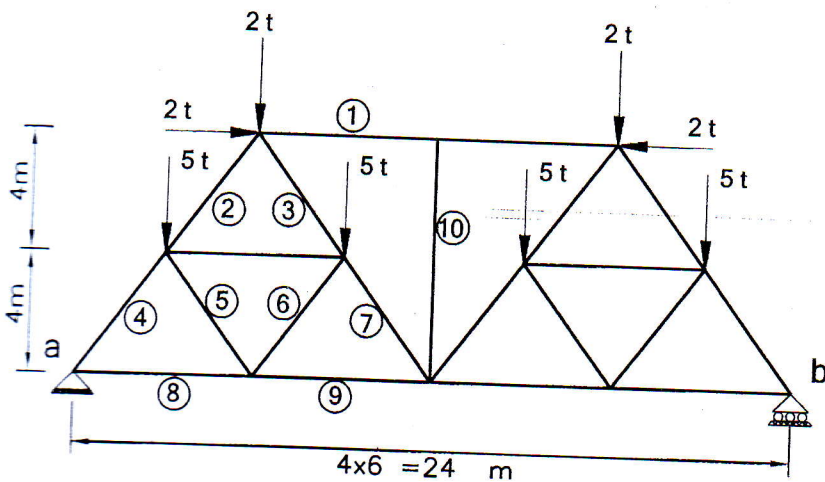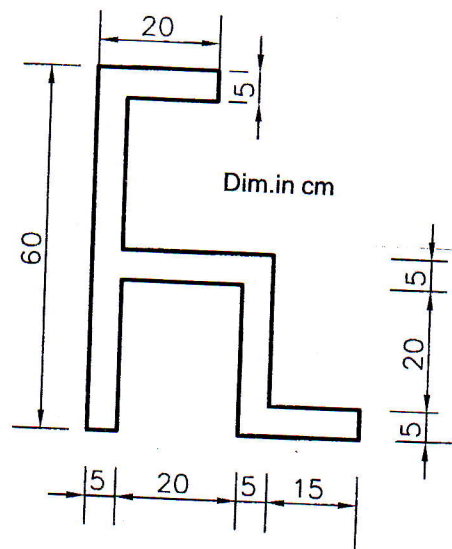For the given section shown in **Fig. (5)**, Find the principle axes and the principal moment of inertia.

2 t   2 t

2 t   ①   2 t

5 t   5 t   5 t   5 t

② ③   ⑩

④   ⑤ ⑥   ⑦

a   ⑧   ⑨   b

4m   4m

4x6 = 24 m

Fig. (4)

20

15

Dim.in cm

60

5   20   5   15

5

20

5

Fig. (5)