TANTA UNIVERSITY
FACULTY OF ENGINEERING
STRUCTURAL ENG. DEP.

STRUCTRUAL ANALYSIS
SECOND YEAR (2016-2017)
2nd TERM

Assignment No. 1

Deflection of Structures by using Virtual Work Method

1- Using the virtual work method, detrmine the value of the slope and deflection at point (m) for the structures shown in Fig. 1. EI = constant.

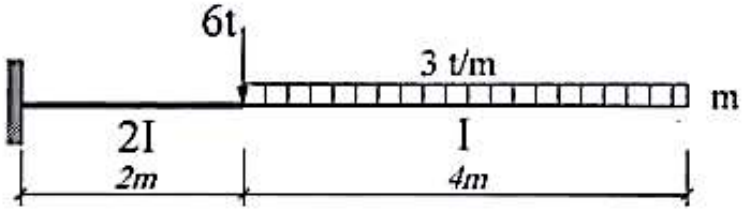


Fig. 1

2- For the shown beam in Fig. 2, determine the vertical deflections at points d and e and slope angles at points a,b and relative slope at d if I = 10000 cm^4 and E= 2000 t/cm^2.

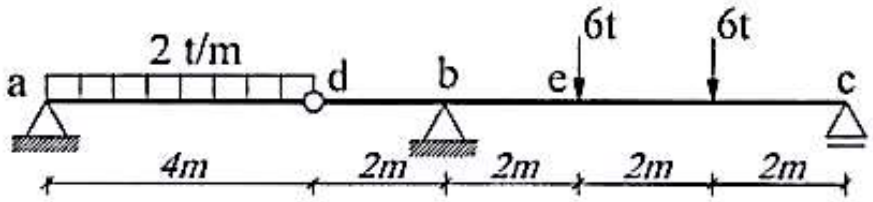


Fig. 2

3- Using the virtual work method, detrmine the value of the slope and deflection at point (m) and (n) . for the structures shown in Fig. 3. EI = 4000 m^2.t

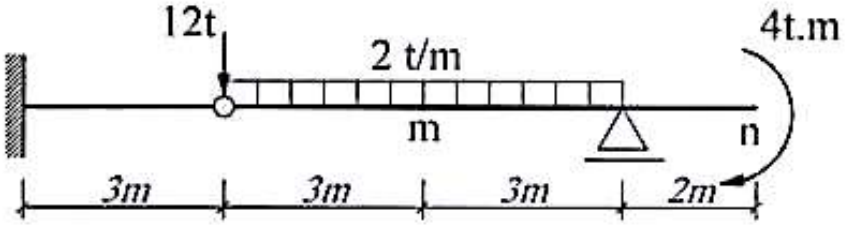


Fig. 3

4- Using the virtual work method, detrmine the value of the slope and deflection at point (c) and for the structures shown in Fig. 4.

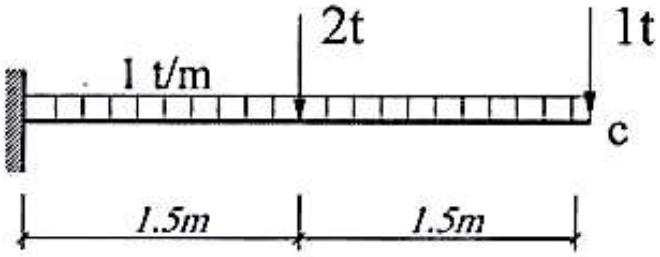
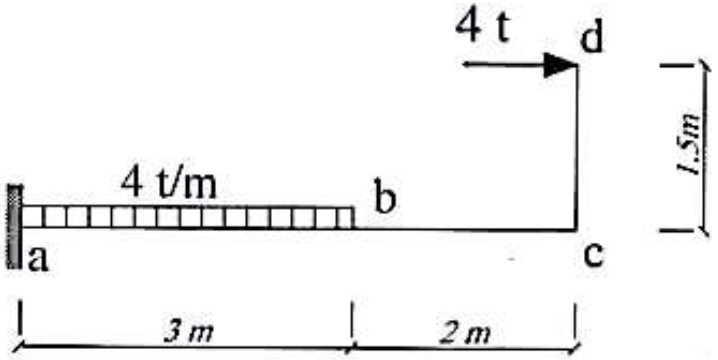


Fig. 4

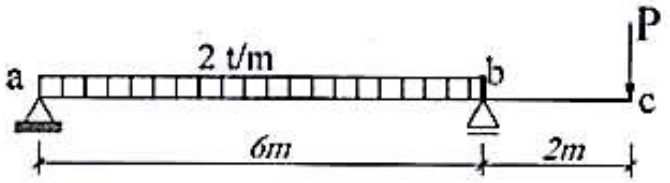
EI = 5000 m .t

5- For the shown cantilever beam in Fig. 5, determine the vertical deflections and slope angles at points b,c and d if I = 10000 cm^4 and E= 2000 t/cm^2. also find the horizontal deflection at point (d).

Fig. 5



6- Calculate the magnitude of load P acting as shown in Fig. 6 such that point c will have zero deflection.



EI = 6000 m^2.t

7- For the shown cantilever beam in Fig. 7 is fixed at a and simply supported at b. The beam is provided with an intermediate hinge at c. For the given system of loading determine the deflections at c and d also find the slope at b. Take I = $2x10^5$ cm^4 and E = 2000 t/cm^2.

Fig. 7