

FACULTY OF ENGINEERING

B.E. III/IV Year (Civil) II Semester (Main) Examination, May/June 2011

THEORY OF STRUCTURES-II

Time : 3 Hours]

[Max. Marks : 75

Answer **all** questions of Part -A.
Answer **five** questions from Part-B.

Part A – (Marks : 25)

1. A wheel load of 100kN moves from left to right on s/s girder of span 10m. Determine the maximum moment at a section 7m from the left support. (3)
2. Define equivalent uniformly distributed live load (EUDLL) for a system forces. (2)
3. State and prove Eddy's theorem. (3)
4. What is the effect caused due to temperature rise on a two hinged parabolic arch? (2)
5. Sketch the I.L.D. for radial shear when a unit load traverses on a three hinged parabolic arch. (3)
6. A UDL of 20kN/m intensity and 2m long traverses a 10m long s/s girder. Determine the maximum moment at a location 4m from left end and "the corresponding position of UDL. (3)
7. What do you understand by the term flexural rigidity of a beam? (2)
8. A suspension cable of span 80m and central dip of 4m is subjected to temperature rise of 20° C. What is the increase in central dip if $\alpha = 12 \times 10^6$ per° C? (2)
9. Find the fixed end moments for a fixed beam of span 6m subjected to two point loads of 50kN each at its middle third- locations using column analogy method.(3)
10. State the assumptions of cantilever method of analysis. (2)

Part B – (Marks : 50)

11. (a) Two wheel loads, 100kN and 150kN spaced 1.2m apart move along a simply supported girder of span 8m. Find the maximum positive and negative shear force at a section 3.2m from the left end. Any wheel load can lead the other. (5)
- (b) A system of loads consisting of 150kN, 200kN, 120kN and 100kN separated by distances 0.8m, 1m and 1.2m respectively moves from left to right on simply supported girder of span 8M. Find the maximum bending moment which can occur under the 120kN load. (5)

12. (a) A three hinged parabolic arch of span 12m has its abutments A and B at depths of 3m and 6m below the crown C. The arch carries a u.d.l. of intensity 30kN/m on the span A-C. Determine the reactions at A and B. (5)
12. (b) A two hinged parabolic of span 12m and central rise of 3m carries u.d.l. of intensity 20kN/m, starting from left support to the crown of the arch. Draw the bending moment diagram for the arch. (5)
13. Draw the Influence lines for forces in members U2-U3, L3-L4, L2-U2, L3-U3 and U2-L3 for the Pratt truss shown in Fig.1. (10)

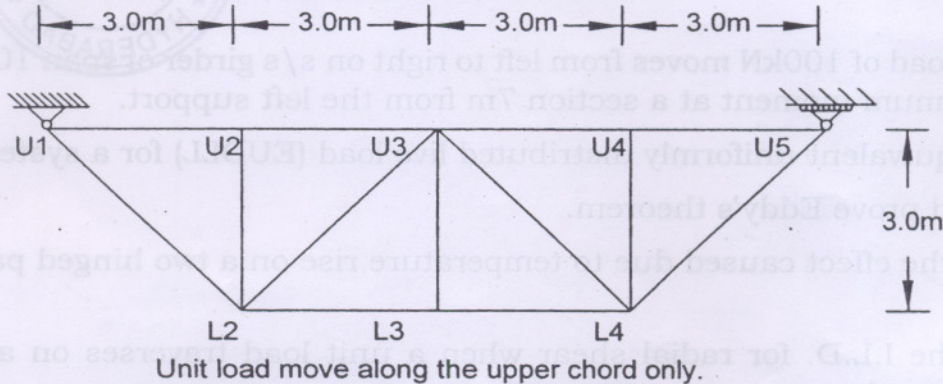
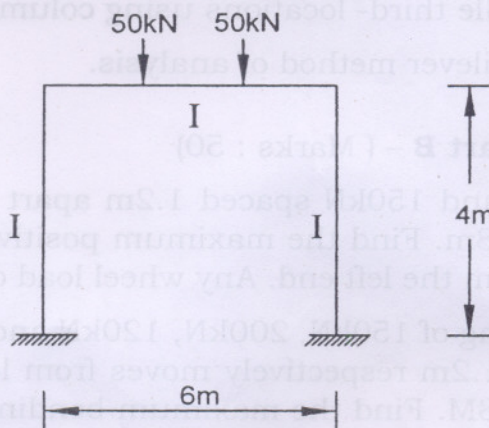


Fig.1

14. A 3-hinge stiffening girder of a suspension bridge of span 100m is subjected to two point loads 200kN and 300kN, placed at 20m and 70m from left end. Find the shear force and bending moment for the girder at a distance of 30m from the left end. The supporting cable has a central dip of 10m. Also find the maximum tension in the cable. Draw the shear force and bending moment diagrams for the girder. (10)
- 15 Analyse the portal frame shown in Fig.2 using column analogy method. Find moments at supports A and B. (10)



16. Using portal method analyse two storied frame shown in Fig.3.

(10)

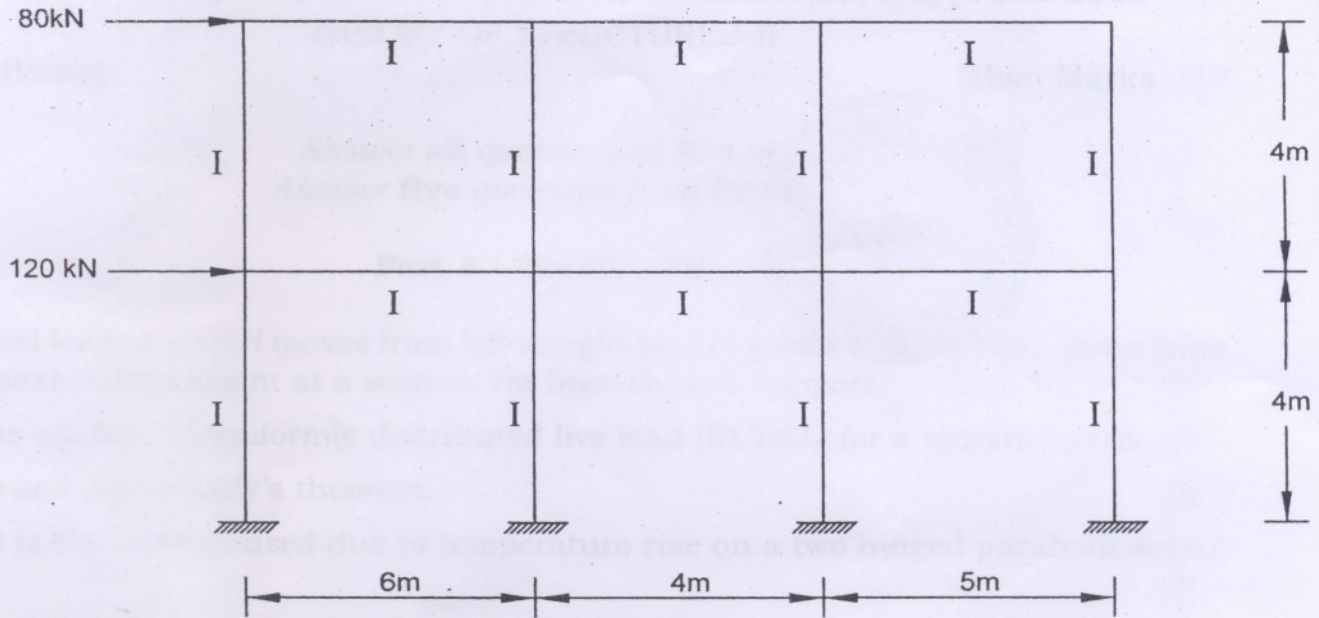


Fig.3

17. Two wheel loads 300kN and 200kN, 2m apart traverses a girder of 10m span with the 200kN load leading from left to right. Draw the maximum shear and maximum moment diagrams. (10)