**Reg. No. :** | | | | | | | | | | |

# Question Paper Code: 31514

B.E. / B.Tech. DEGREE EXAMINATION, NOVEMBER 2015

Fifth Semester

Civil Engineering

01UCE504 – STRUCTURAL ANALYSIS - I

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

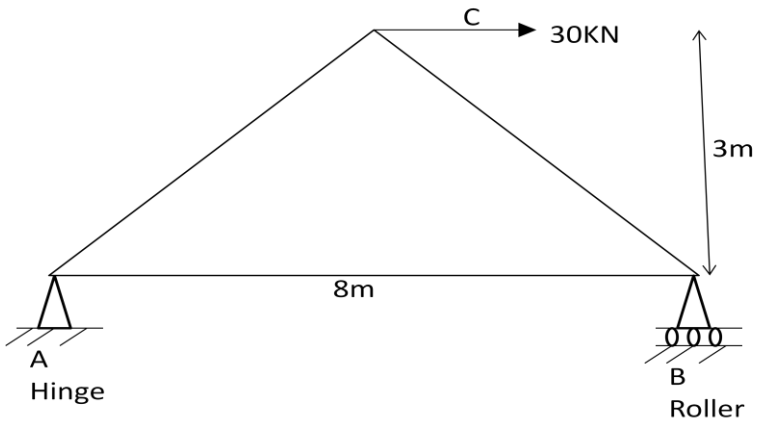
1. State principle of virtual work.
2. Differentiate determinate and indeterminate structures.
3. State the limitations of slope deflection method.
4. State the assumptions in slope deflection method.
5. Distinguish between sway and non sway type problem.
6. What is carry over moment and carry over factor?
7. Describe the use of force method?
8. Define static indeterminacy with example.
9. Which property of the structure determines the size of its stiffness matrix?
10. What is meant by generalized coordinates?

PART - B (5 x 16 = 80 Marks)

11. (a) What is Williott's diagram? Describe its uses and importance in detail. (16)

Or

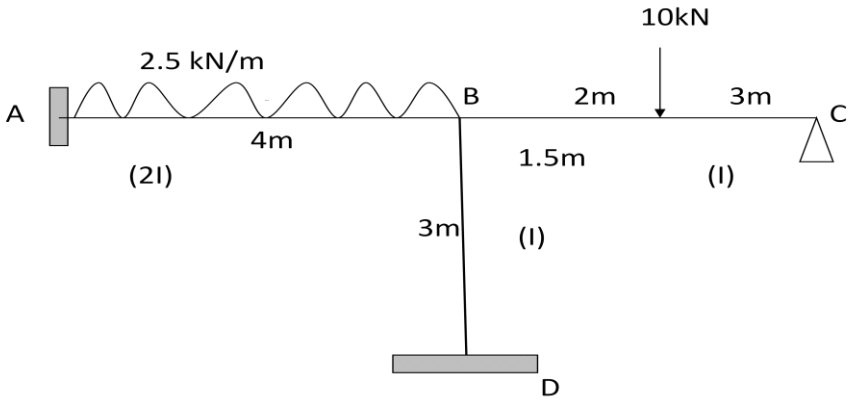
(b) Determine the vertical and horizontal displacement of the joint in a pin jointed frame shown in below figure. (16)



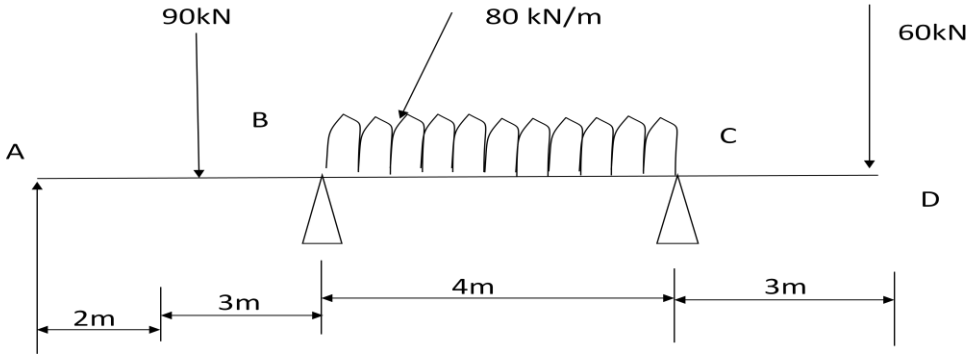

12. (a) A continuous beam *ABC* consists of spans *AB* and *BC* of length 5 *m* each. Both ends of the beam are fixed. The span *AB* carries a point load of 15 *kN* at its middle point. The span *BC* carries a point load of 25 *kN* at its middle point. Find the moments and reactions at the supports. Assume the beam is of uniform section. Use slope deflection method. (16)

Or

(b) Analyze the given frame by slope deflection method and draw SFD and BMD. *EI* is constant. (16)

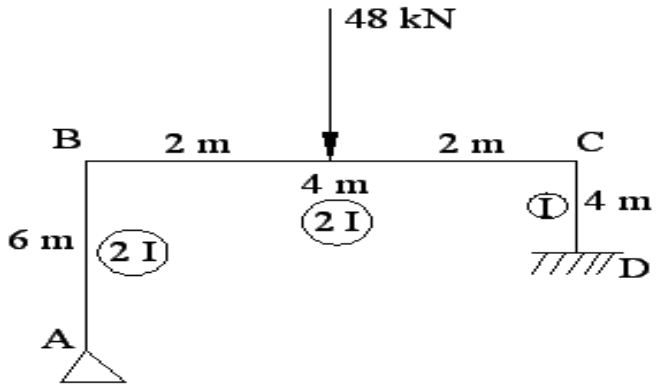


13. (a) Draw BMD for continuous beam as shown in below figure, if the support *B* sinks by 2.5*mm*. Take $I=3.5x10^7\ mm^4$, $E=200\ KN/mm^2$ Using moment distribution method. (16)




Or

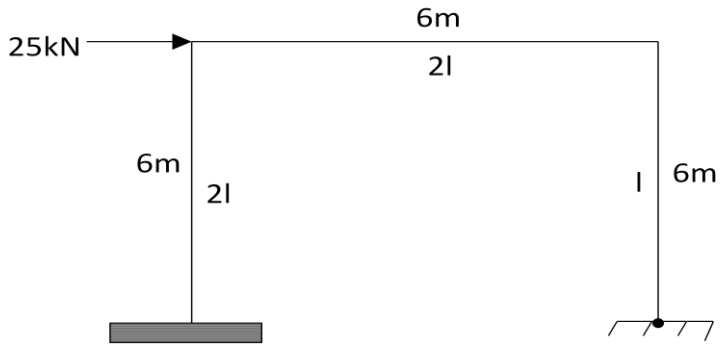
(b) Analysis the frame as shown in figure using moment distribution method and draw BMD. (16)



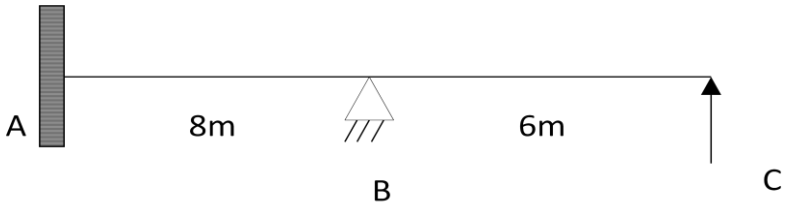

14. (a) Using flexibility matrix method analyzes the given beam and draw the BMD. (16)


Or

(b) Analyze the frame using flexibility matrix method. (16)




15. (a) Analyze the continuous beam *AB*, *EI*=60000 *kN-m*$^2$. Use stiffness method. (16)




Or

(b) Using stiffness method analyze the frame. (16)