FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I – Semester (Main) Examination, November 2013

Subject : Theory of Structures – I

**Time : 3 hours**   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1. Write the importance of shear centre. What are the factor's which are influencing the shear centre.   3

2. Write the difference between symmetrical and unsymmetrical bending.   3

3. Explain theorem of minimum energy.   3

4. What are the limitations of Kani's method?   3

5. Explain carry over factor and relative stiffness.   3

6. What is internal redundancy? Give an example.   2

7. What are knee braces in trusses?   2

8. Under what conditions sway analysis is to be done for a single bay single storey portal frame.   2

9. Using energy principle, find slope at the free end of a cantilever beam subjected to point load at the free end.   2

10. Define principle axes. Obtain the same if $I_x = 1.2 \times 10^6$ mm^4, $I_y = 1.2 \times 10^6$ mm^4, $I_{xy} = 1.2 \times 10^6$ mm^4.   2
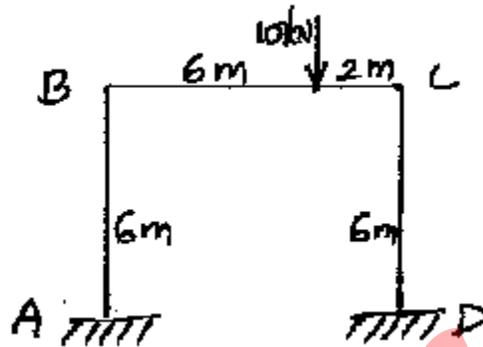
PART – B (50 Marks)

11. Analyse the given continuous beam using slope deflection method.
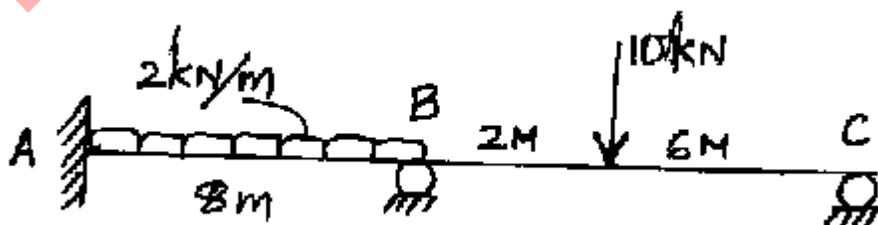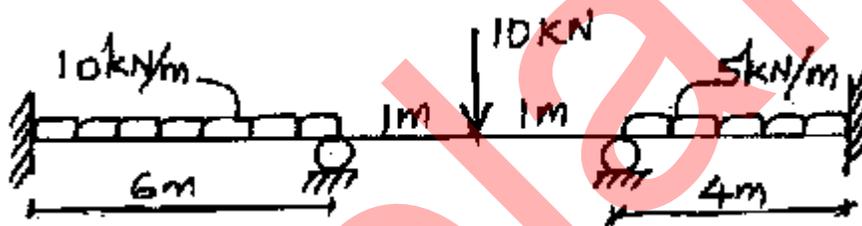

12. Analyse the given portal frame by using Kani's method.
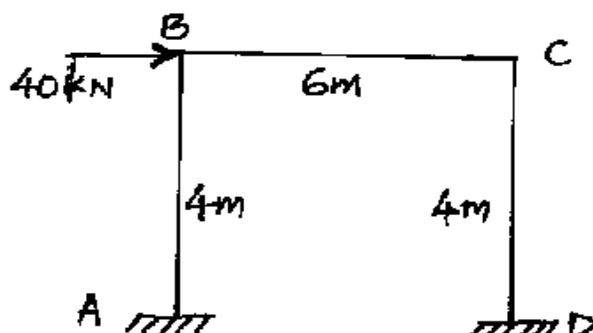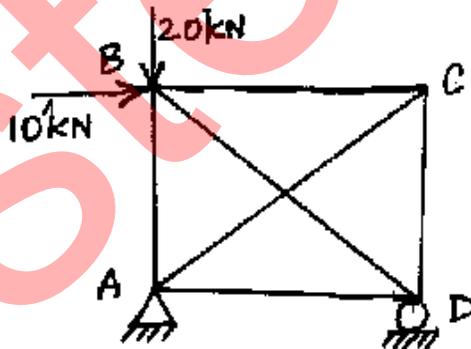
13. Draw the BMD and show all important features of the diagram using slope deflection method for the given portal frame.


14. Draw SFD and BMD of the given continuous beam using Kani's method of analysis.

15. Determine the forces in all members of the redundant truss shown. Take A = 100mm^2, E = 200 GPa for all members.

16. A cantilever beam with rectangular cross section 150 mm x 200 mm depth as a span of 2m. The cantilever carries a concentrated load of 20 kN at the free end as shown in the figure. Determine the stresses at all corners of the beam at the fixed support.
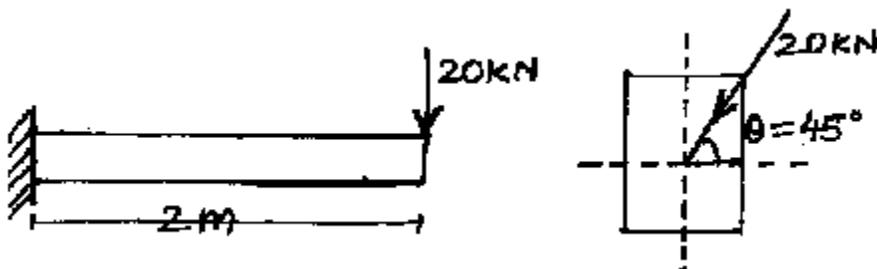
17. Analyse the portal frame using moment distribution method.

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