



Code No. : 5414/N

**FACULTY OF ENGINEERING**  
**B.E. 2/4 (Civil) II Semester (New) (Main) Examination, May/June 2012**  
**STRENGTH OF MATERIALS – II**

Time: 3 Hours]

[Max. Marks : 75

**Note :** Answer *all* questions from Part A, Answer *any five* questions from Part B.

**PART – A**

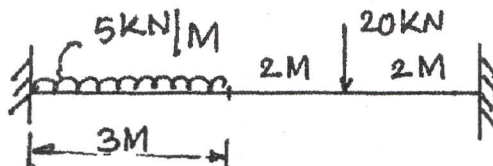
**(25 Marks)**

1. Define slope and deflection of a beam subjected to external load. 3
2. Write down the limitations of Macaulay's method. 3
3. Differentiate between elastic prop and rigid prop. 3
4. Define modulus of rupture and torsional rigidity. 3
5. Explain Maxwell Reciprocal Theorem. 3
6. Write the formula of stiffness of open coil helical spring in terms of  $E, G, J, I, O, I, R$ . Subjected to compressive load. 2
7. Write short notes on tension co-efficient method. 2
8. What are the limitations of Eulers theory ? 2
9. State and explain Claypeyron's theorem of three moments. 2
10. What are limitations of strain energy method ? 2

**PART – B**

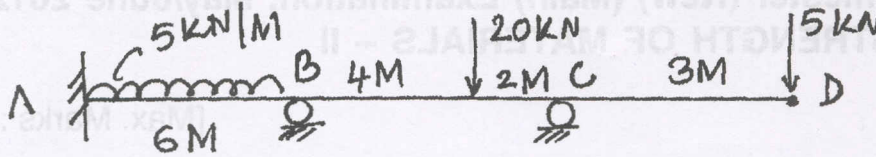
**(50 Marks)**

11. Find slope and deflection of a Cantilever beam at a distance of 3 M from the fixed end which is subjected to UDL of 30 kN/M over a entire span of length 10 M.
12. Draw SFD and BMD and show the man values of the fixed beam.





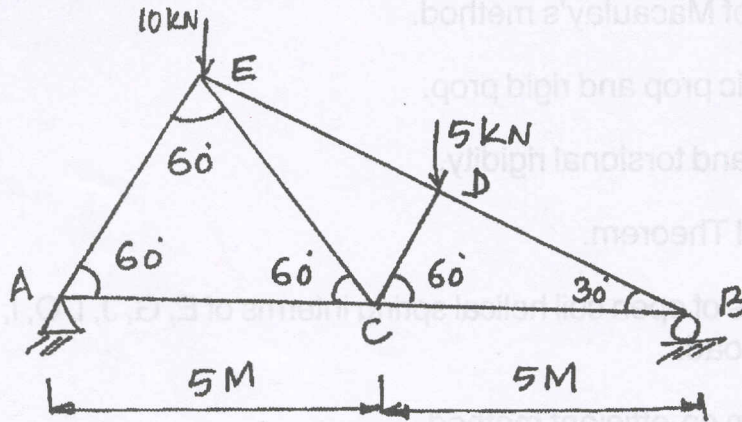
13. Draw the SFD and Net BMD of the continuous beam.



14. Derive the torsion equation.

$$\frac{T}{J} = \frac{f_s}{R} = \frac{C_\theta}{l}$$

15. Find the member forces of the truss by tension co-efficient method.



16. A closely coiled helical spring is made up of 10 mm diameter steel wire having 12 no. of coils with 80 mm mean diameter if the spring is subjected to axial twist of 10 NM. Determine the bending stress and increase number of turns. Take  $E = 200 \text{ GPa}$ .

17. Find the deflection under the load of the beam in terms of  $EI$ .

