Code No. : 5023/O

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

Time : 3 Hours] [Max. Marks : 75

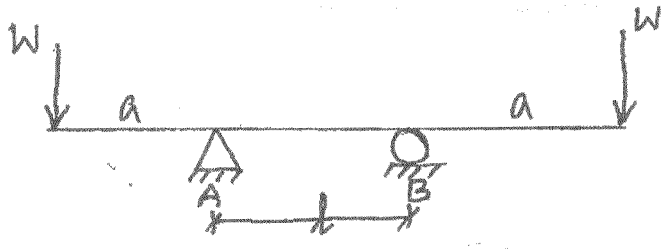
Note : *Answer **all** questions of Part **A**. Answer **five** questions from Part **B**.*

PART – A **(25 Marks)**

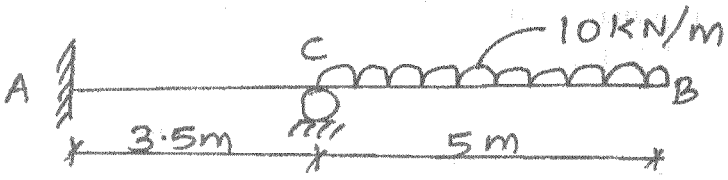
1. State Mohr's first and second theorem for moment area method. **2**
2. Sketch the conjugate beam for a double overhanging beam. **2**
3. Explain Claypeyron's theorem. **2**
4. Define principal stress and principal strain. **2**
5. What is the significance of tension coefficient method ? **2**
6. In a close coiled helical spring subjected to an axial load, if the wire diameter is doubled keeping the other quantities same, then the stiffness of spring when compared to the original one will become **3**
7. Deduce an expression for stress due to impact loading. **3**
8. List the assumptions made in Euler's column theory. **3**
9. Determine the propped reaction in a propped cantilever beam subjected to UDL over entire span. **3**
10. Calculate the torsional rigidity for a circular shaft of 200 mm diameter taking C = 80 GPa. **3**

PART – B **(50 Marks)**

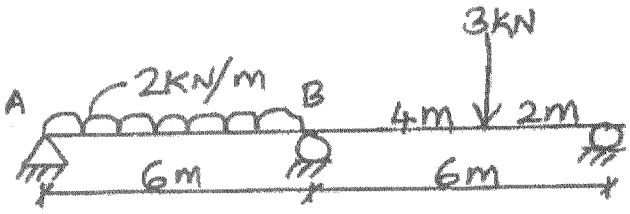
11. Show that the maximum deflection of the beam shown below is $\frac{Wal^2}{8EI}(l > a)$.



12. Find the value of propped reaction "R" at the prop.

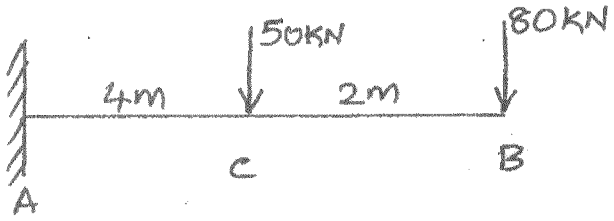


13. Draw SFD, BMD of the given continuous beam.



14. Deduce the simple torsion equation of a circular shaft.

15. Determine th slope and deflection at the free end of the given beam using castigliano theorem. Take E = 200 GPa, I = $10\times10^8 mm^4$.



16. An open coiled helical spring is subjected to an axial load of 50 KN. Determine the deflection of the spring and maximum shear stress in the spring wire. The spring particular's are as follows :

α =16°, n = 4, R = 30 mm, d = 5mm, C = 80 GPa, E = 200 GPa.

17. Derive Secant and Perry's formula for a column.