Roll No. ☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 3

Total No. of Questions : 9

B.Tech. (CE) (Sem.–4th) (2011 Batch)

STRUCTURAL ANALYSIS-I

Subject Code : BTCE-406

Paper ID : [A1176]

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Answer briefly :

    i)   What is a conjugate beam? Discuss its utilities.

    ii)   What are zero-force members? Why are they required?

    iii) Differentiate the statically determinate structures and statically indeterminate structures.

    iv)   What is meant by absolute maximum bending moment in a beam?

    v)   State Maxwell-Betti's theorem.

    vi)   What is a linear arch?

    vii) Give a relation between actual beam and the conjugate beam when the former has a fixed end.

    viii) What is electic curve?

    ix)   Find the horizontal reaction for u

    x)   What are the failures criteria an criteria of a dam section?

                                        SECTION-

2. A simply supported steel beam of spa of 50 kN at 3 m from the left su cross-section with the diameter of 100 steel is 200 GPa. Find the deflection (theorem.

3. Define Muller-Breslau principle. Use t for the moment at B of an overhang be
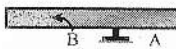
    Fig. 1

4. A three-hinged arch of 80 m-span an load which varies uniformly from zero springing. Determine the equation of th normal thrust.

5. A cable is used to support six equal an 49 m. The central dip of the cable is 5 Find the length of the cable required tensile stress is 157.4 N/mm².

6. A masonry dam 8 m high, 1.5 m wid base retains water to a depth of 7.5 m. stress intensities at the base. The wei weight of masonry is 22000 N/cum.

SECTION-C

7. Solve the continuous beam shown in Fig. 2 by Castigliano's theorem. Draw the SFD and BMD for the beam.
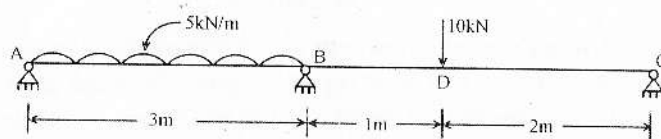

Fig. 2

8. Determine the force in each member of the truss shown in Fig. 3 by using the method of joints.
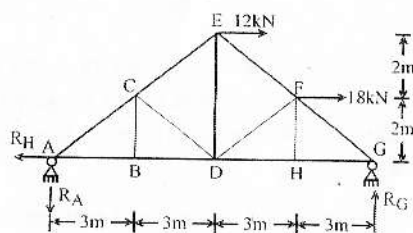

Fig. 3

9. A beam is simply supported over a span of 40 m and supports two point loads of 80 kN and 100 kN respectively and 10 m apart rolling over the span. Draw the influence lines for shear force and bending moment for a section 15 m from the left support and determine the maximum shear force and bending moment at that section.