

**II B.Tech I Semester Supplementary Examinations, November 2006**  
**STRENGTH OF MATERIALS-I**  
**(Civil Engineering)**

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
 All Questions carry equal marks

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- What do you understand by yielding, strain - hardening, neck formation and permanent set.
  - Find the minimum dia. of a steel wire with which a load of 4000 N can be raised so that the tensile stress in the wire may not exceed  $130 \text{ N/mm}^2$  calculate the extension of the wire, if it is 3 m long. Take  $E = 200 \text{ GPa}$ .  

[6+10]
- A crane chain having sectional area  $650 \text{ mm}^2$  carries a load of 12 kN. As it is being lowered at a uniform rate of 40 m per minute, the chain got jammed suddenly, at which time the length of the chain unwound was 10 m. Calculate the stress induced in the chain due to sudden stoppage. Neglect the weight of the chain. Take  $E = 200 \text{ GPa}$ .  

[16]
- Define the "Beam" and the type of action and deformation it undergoes.
  - Draw the S.F. and B.M. diagram for a simply supported beam of span  $L$  m loaded with UDL of  $w \text{ KN/m}$ .  

[6+10]
- Define Neutral axis. Sketch the bending stress distribution across the cross section of a rectangular beam section  $230 \times 400 \text{ mm}$  subjected to 60 KNm moment. [16]
- Calculate the forces induced in the members of the pin jointed truss shown in Figure 5 by method of section. [16]

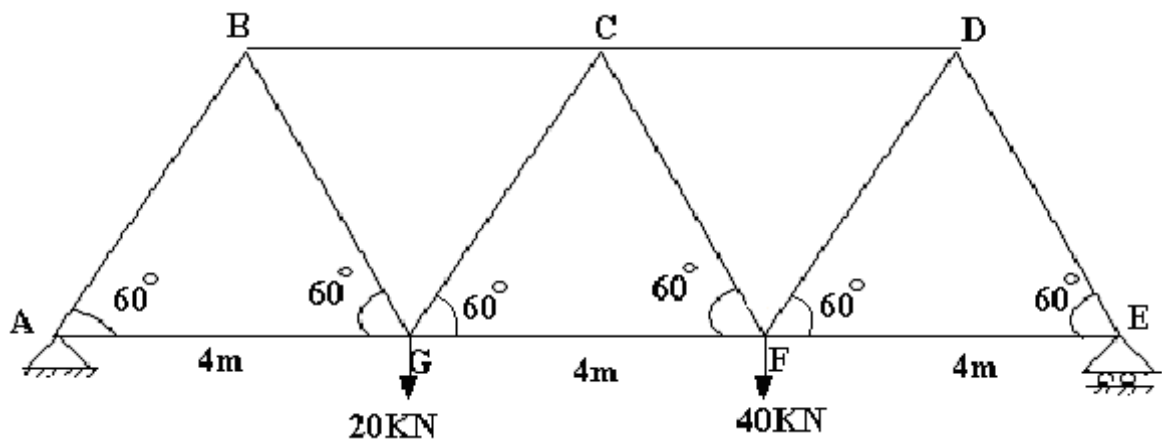


Figure 5

- A simply supported beam shown in the Figure 6 carries a uniformly distributed load of intensity  $w$  symmetrically distributed over part of its length. Determine the

maximum deflection and check your results by assuming  $a = 0$  and compare, when same beam with u.d.l on entire span . [16]

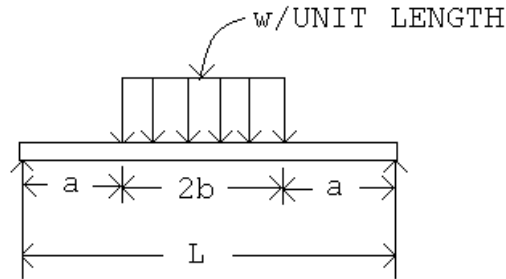


Figure 6

7. (a) Explain the different types of riveted Joints.  
 (b) Design a riveted Joint to connect an angle section tension member  $80\text{mm} \times 80\text{mm} \times 8\text{mm}$  to a gusset plate  $12\text{mm}$  thick. The member is to carry a load of  $100\text{ kN}$ . [8+8]
8. (a) Distinguish between cylindrical shell and spherical shell.  
 (b) To what depth would a copper float  $25\text{ cm}$  in diameter and  $3\text{ mm}$  thick have to be sunk in sea water in order that its diameter is decreased by  $0.03\text{mm}$ .  
 Take  $E_C = 1 \times 10^5\text{ N/mm}^2$ ,  $\mu = 0.27$  , weight of sea water =  $1050\text{ kg/m}^3$ . [6+10]

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