

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION- JUNE -2016

B.Tech - VI Semester

COURSE CODE: 10B11CE615

MAX. MARKS: 35

COURSE NAME: ADVANCED STRUCTURE ANALYSIS

COURSE CREDITS: 04

MAX. TIME: 2 HRS

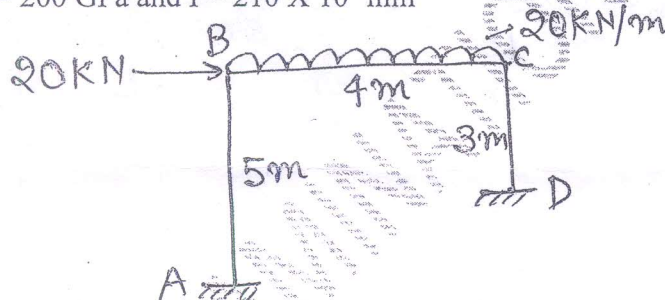
Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1. (i) Derive the global stiffness matrix of a truss member.

(ii) Define flexibility and Stiffness of a structure and relation in between them.

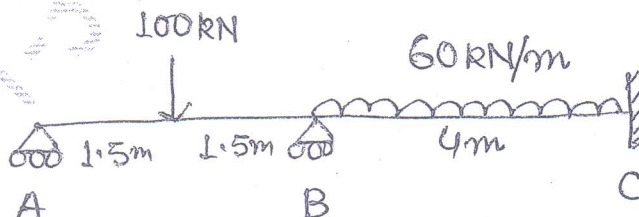
(iii) Why Flexibility method is not used in design software? (4+2+1)

Q.2. Analyze the rigid jointed frame shown below by Flexibility Method. EI is constant for all members. $E = 200 \text{ GPa}$ and $I = 210 \times 10^6 \text{ mm}^4$



(7)

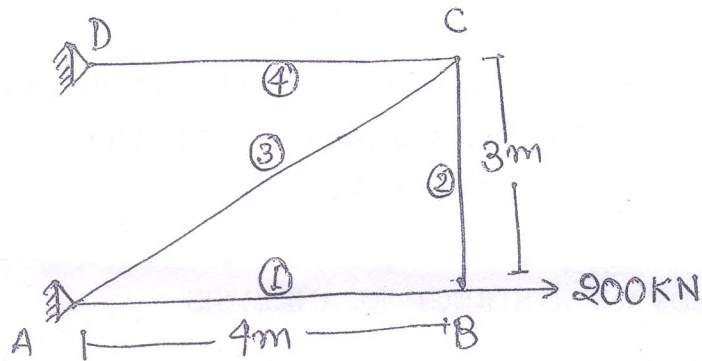
Q.3. Analyze the given beam by Flexibility Method. Take slopes at A and B as redundant. EI is constant for all members. $E = 200 \text{ GPa}$ and $I = 210 \times 10^6 \text{ mm}^4$



(7)

Q.4. For the truss shown, determine the joint displacement, support reaction and member forces.

Take $E = 200 \text{ GPa}$, $A_1 = A_3 = 2000 \text{ mm}^2$, $A_2 = 2500 \text{ mm}^2$, $A_4 = 3000 \text{ mm}^2$.



(7)

Q.5. For given beam find unknown support reaction and unknown displacement using stiffness method. At D, a steel angle section is attached with the beam having a load of 100 kN. At B beam have an internal hinge. $E = 200 \text{ GPa}$ and $I = 210 \times 10^6 \text{ mm}^4$. (7)

