Q.P. Code: **16CE2003** **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year I Semester (R16) Regular Examinations January 2017

ADVANCED STRUCTURAL ANALYSIS

(Structural Engineering)

(For Students admitted in 2016 only)

Time: **3 hours** Max. Marks: **60**

(Answer all Five Units **5 X 12 =60** Marks)

UNIT-I

Q.1 a. Explain the classification of structures with examples. 6M

b. Determine degree of freedom and degree of redundancy for the following beam as shown in Fig (1). 6M

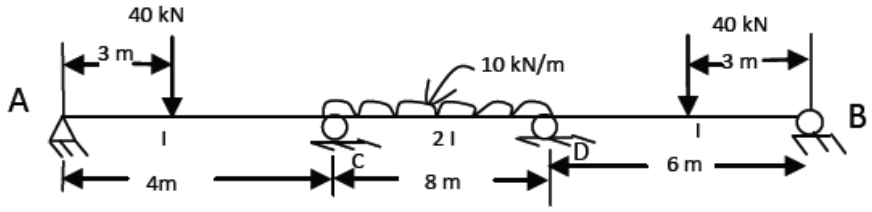

Fig (1)

OR

Q.2 a. What is static and kinematic indeterminacy? 6M

b. What is degree of static and kinematic indeterminacy of the following frame shown in Fig(2) 6M

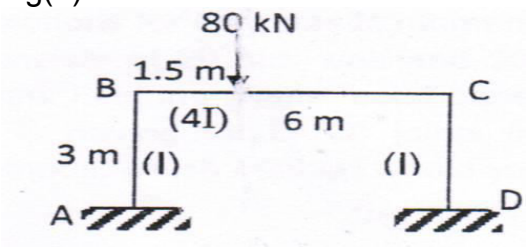

Fig (2)

UNIT-II

Q.3 a. Derive the flexibility and stiffness relations when the force gives to
(i) Force displacement
(ii) Bending or flexural displacement.
(iii) Transverse displacement 6M

b. Write the procedure analyzing of structure by flexibility method. 6M

OR

Q.4 For the simply supported beam shown in Fig (3). Develop the flexibility matrix. 12M

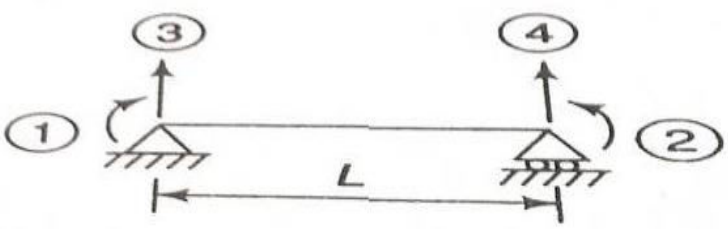

Fig (3)

UNIT-III

Q.5 Analyze the continuous beam shown in Fig (4), by stiffness method. The downward settlement of supports B and C in KN-m are 1500/EI and 750/EI. 12M

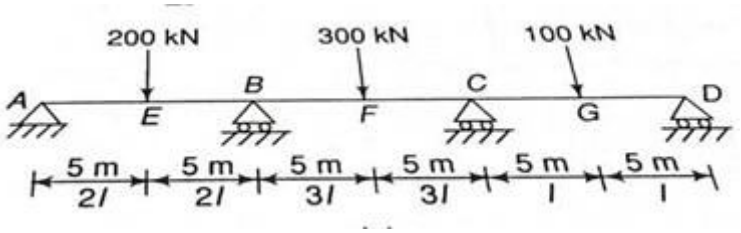

Fig (4)

OR

Q.6 Analyze the pin-jointed plane frame shown in Fig (5), if there is no displacement at support L4. 12M

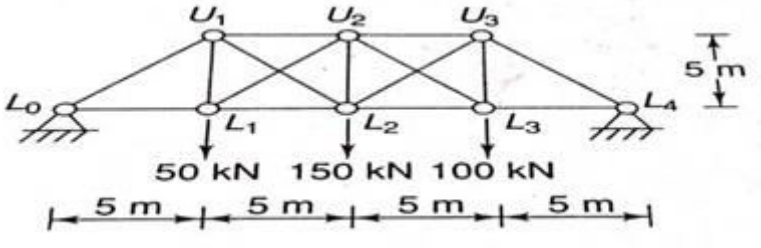

Fig (5)

UNIT-IV

Q.7 Calculate the stiffness matrix and also draw the bending moment diagram for the following frame shown in Fig (6) 12M

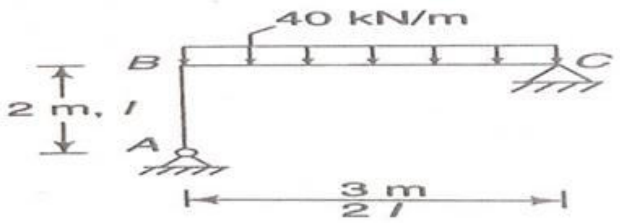

Fig (6)

OR

Q.8 Analyze the portal frame shown in Fig (7) by flexibility method 12M

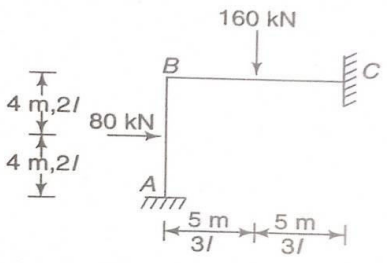

Fig (7)

UNIT-V

Q.9 Analyze the continuous beam shown in Fig (8) by using displacement method. Use matrix transformations method. 12M

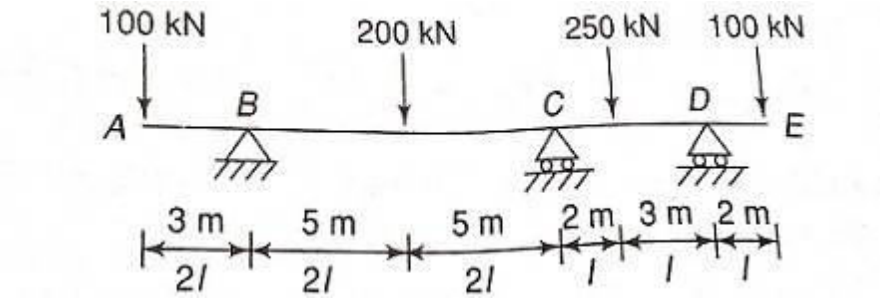

Fig (8)

OR

Q.10 a. Write short notes on
(i) Matrix inversion method.
(ii) Static Condensation. 6M

b. Determine the solution by using Gauss elimination method.
2x1 – 2x2 +4x3 = -3
2x1 + 3x2 +2x3 = 5
-x + x2 - x3 = 1 6M

***** END *****