320833(20)

APR- MAY

B. E. (Eighth Semester) Examination, 2020

(New Course)

(Civil Engg. Branch)

STRUCTURAL ANALYSIS-III

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part *(a)* of each questions is compulsory.
Solve any one question from *(b)* and *(c)*
carrying equal marks.

Unit-I

1. (a) Write assumptions made in cantilever method of
   approximate analysis.   2

   (b) Analyze the frame shown in figure using portal
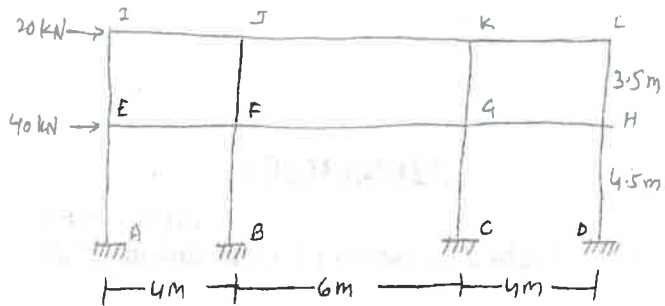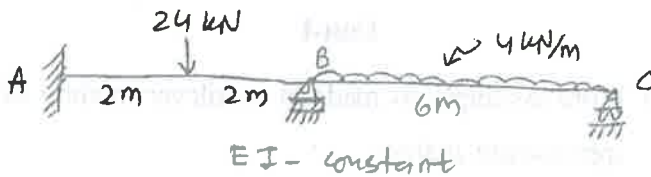   method of approximate analysis.   14

Fig.-(1)

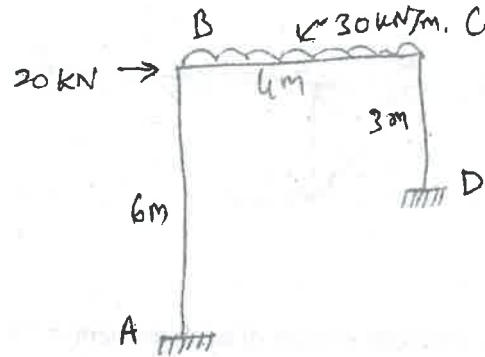(c) Analyze the frame as shown in Q.-1(b) using cantilever method of approximate analysis.   14

Unit-II

2. (a) Give any two properties of flexibility method or force method.   2

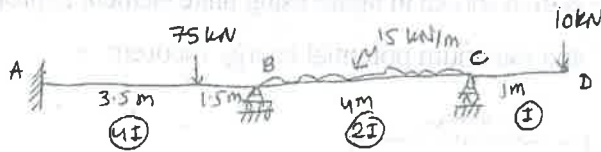(b) Analyze the continuous beam shown in figure using flexibility method.   14

(c) Analyze the portal frame using flexibility method or force method.   14

[3]

Unit-III

3. (a) Write any two properties of stiffness method or displacement method. 2

   (b) Analyze the continuous beam as shown in figure using stiffness method or displacement method. 14

   (c) Develop stiffness matrix with reference to the given coordinates as shown in figure pin jointed structure. 14
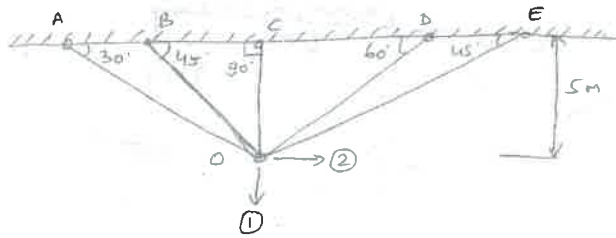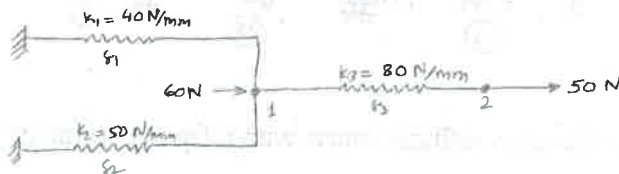
Area of cross section of each element = 2000 mm^2

E = 200 GPa.

Unit-IV

4. (a) Give any two advantages of finite element analysis over classic method of Analysis.   2

(b) Determine the displacements of modes of the spring system shown in figure using finite element approach and minimum potential energy theorem.   14
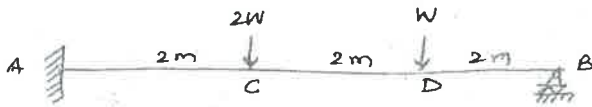

(c) Determine member forces of a three bar element as shown in figure using minimum potential energy theorem.   14
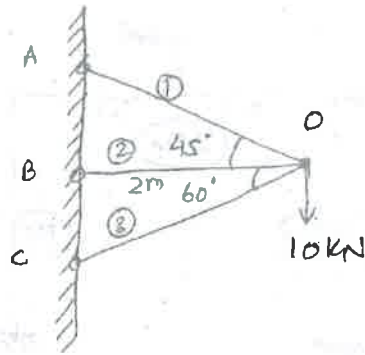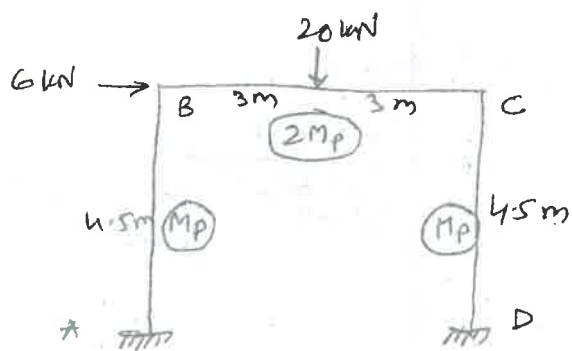
Unit-V

5. (a) Explain collapse mechanism and write types mechanism.   2

(b) For the propped cantilever as show in figure, determine collapse load W_C. The beam is prismatic having plastic moment capacity equal to M_p.   14

(c) Find the value of M_p for a portal and loaded up to collapse as shown in figure.   14

20 kN

6 kN →

B   3m   3m   C

2Mp

4.5m Mp   Mp 4.5m

A   D