Printed Pages – 6   Roll No. : ....

320833(20)

B. E. (Eighth Semester) Examination, April-May 2021

(New Scheme)

(Civil Engg. Branch)

STRUCTURAL ANALYSIS-III

Time Allowed : Three hours
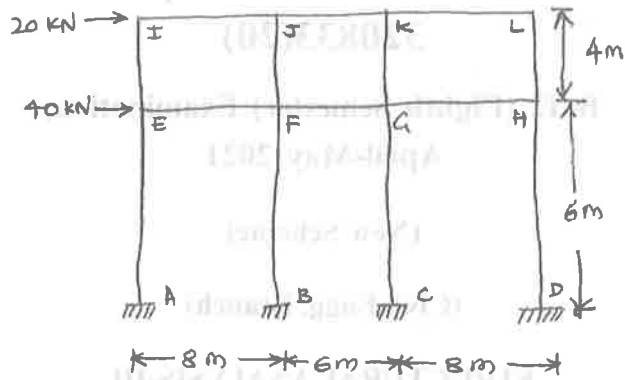
Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. Part (a) of each question is compulsory worth 2 marks. Attempt any **one** question part from (b) and (c) of each question worth 14 marks.*

Unit-I

1. (a) Write assumptions made for Cantilever method of Approximate Analysis.   2
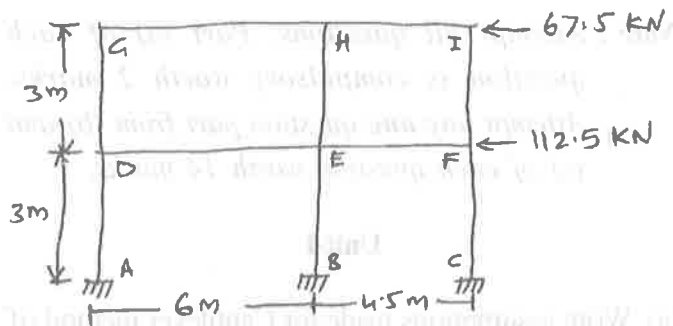
(b) Analyze the frame as shown in figure using portal method of approximate analysis. 14

Figure

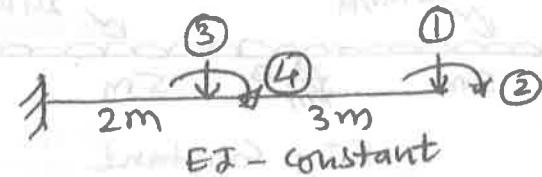(c) Analyze the frame as shown in figure using cantilever method of approximate analysis. 14
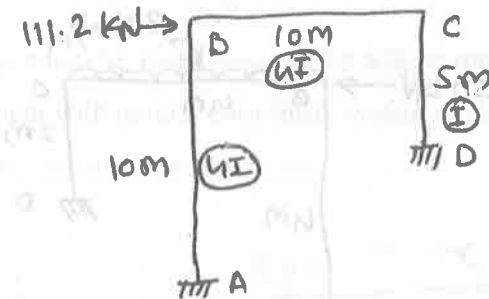

Figure

Unit-II

2. (a) Write any four properties of flexibility matrix. 2

(b) Develop the flexibility matrix for the beam shown in figure with reference to the coordinates indicated on the figure. 14

Figure

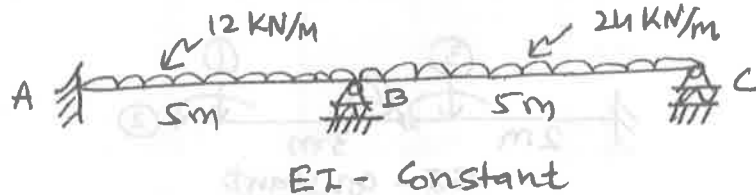(c) Analyze the portal frame as shown in figure using flexibility method or force method. 14
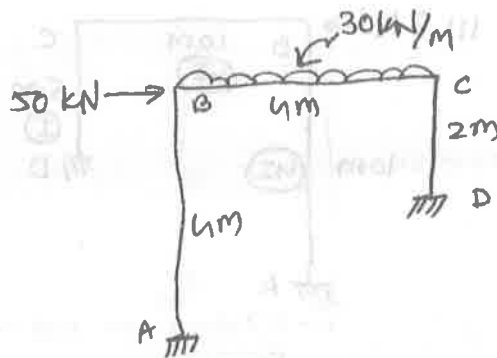

Figure

Unit-III

3. (a) Write stiffness matrix for a truss element. 2

(b) Analyze the continuous beam using stiffness method of displacement method. 14

12 KN/M   24 KN/m

A   5m   B   5m   C

EI - Constant

Figure

(c) Analyze the portal frame as shown in figure using stiffness a displacement method. 14

30kN/m

50 kN → B   4m   C

2m

4m   D

A
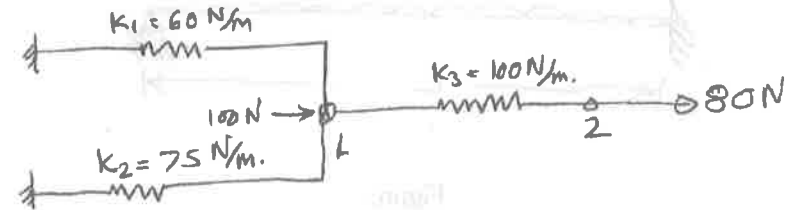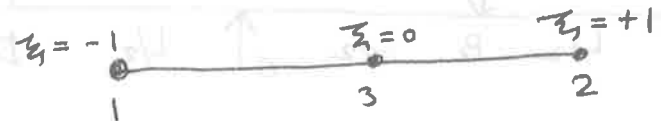
Figure

Unit-IV

4. (a) Write four advantages of PEM over classic method. 2

(b) Determine the displacements of nodes 1 and 2 in the spring system shown in figure using minimum of potential energy principle to assemble equations of equilibrium. 14

$K_1 = 60$ N/m

$K_3 = 100$ N/m.

100 N → ①   ② → 80 N

$K_2 = 75$ N/m.   1

Figure

(c) Determine the shape function for a three model bar element with natural coordinate system as shown in figure and show its variations. 14
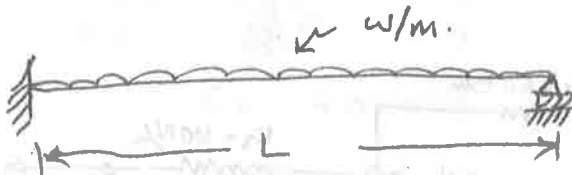

$\xi = -1$ $\xi = 0$ $\xi = +1$
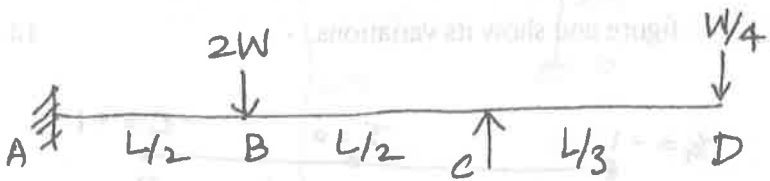
1   3   2

Figure

Unit-V

5. (a) Draw neat sketches the variation of bending stress distribution in elastic and plastic stage. 2

(b) Find out the collapse load for a propped cantilever subjected to a u.d.l. w/unit length as shown in figure. 14

Figure

(c) A propped cantilever ABCD is loaded as shown in figure. Find the collapse load if the beam is of uniform cross section. 14

Figure