GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022 B. Tech Degree Examinations, June – 2021 (Sixth Semester) BCEPC602 > STRUCTURAL ANALYSIS II (Crvil Engineering) Time: 2 hrs <u>Maximum: 50 Marks</u> Answer ALL Questions Coll Engineering Coll Engineering Coll Engineering Coll Answer ALL questions Coll (POR) a. Which is the correct slope deflection equation for continuous beam AB (CO2) [PO2] (i)MAB=MFAB + (4E10A/L +2E10B/L - (ii) MAB=MFAB + (4E10B/L +2E10A/L - 6E1A/L ⁵) b. The slope deflection equations give the relationship between [CO2] [PO1] (i)Slope and deflection only (ii) B.M and rotations only (iii) B.M and vertical deflection only (iii) B.M and rotations only (iii) Mad and vertical deflection only (iv) M.M. rotation and deflections c. A beam is hinged at end A and fixed at B. A moment M is applied at end A. What is the moment development at end B? (i) M (iii) $M2$ (iv) $-M2$ (b) Vah is the carro ver factor from A to B while using moment distribution for analysing beam as shown in the figure given below? (i) $1/2$ (ii) $1/2$ (ii) $1/2$ (iii) $1/2$ (i) M is the maximum tension in the figure given below? (i) $1/2$ (iii) is decreased (iii) remains unchanged (iv) becomes zero f. What is the maximum tension in the cable (iii) Trunx $-\sqrt{H^2} - \sqrt{H^2}$ (ii) Trunx $-\sqrt{H^2} - \sqrt{M^2}$ (ii) Trunx $-\sqrt{M^2} + \sqrt{H^2}$ g. Which of the following methods of structural analysis is a force method? (ii) Na = $\sqrt{2} + \frac{1}{2}$ (iv) Trunx $-\sqrt{2} + \frac{1}{2}$ g. Which of the following methods of structural analysis is a force method? (ii) or anal $\sqrt{2} + \sqrt{H^2}$ (iv) Trunx $-\sqrt{2} + \sqrt{4}$ g. Which of the following conditions form the basis of this method? h. Which of the following conditions form the basis of this method? h. Which of the following conditions form the basis of this method? h. Which of the following conditions form the basis of this method? h. Which of the following conditions form the basis of this method? h. Which of the following conditions form the basis of this meth	QPO	C: RJ18001121	AR - 1	8 Reg. No.			
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(i) radius of curvature is infinite(ii) curvature is infinite(iii) moment is infinite(iv) flexural stress is infinite	i.					[CO5]	[PO1]
				(ii) curvature is infinite			
j. For the plastic analysis, the criteria for the analysis of a structure is based on [CO5] [PO1]		(iii) moment is i	nfinite	(iv) flexural stress is infinite			
	j.	For the plastic as	nalysis, the criteria for the	analysis of a structure is based on		[CO5]	[PO1]

(i) working load	(ii) yield load
(iii) ultimate load	(iv) breaking load

	PART – B: (Short Answer Questions)		(2 x 5 = 10 Marks)		
<u>Q.2.</u>	Answer ALL questions	[CO#]	[PO#]		
a.	State the general slope deflection equation for two span continuous beams.	[CO2]	[PO1]		
b.	continuous beam ABC of length 2L (with uniform flexural rigidity EI) is simply apported at the ends A and C and continuous over the support B at mid-length. Sing moment distribution method, determine the moment at the support B, if it abjected to a uniformly distributed load 'w' throughout the length.		[PO2]		
c.	How will you calculate the horizontal thrust in a two hinged parabolic arch if is a rise in temperature?	there [CO3]	[PO1]		
d.	Compare flexibility method and stiffness method.	[CO4]	[PO2]		
e.	State the upper and lower bound theorems.	[CO5]	[PO2]		
PART – C: (Long Answer Questions) (6			x 5 = 30 Marks)		

Answer ANY FIVE questions

3. Analyze the continuous beam shown in fig: by slope deflection method and draw the bending moment. Take EI= constant.

$$A \oint \frac{40 \text{ kN}}{B} \frac{10 \text{ kN/m}}{10 \text{ kN/m}} \frac{30 \text{ kN}}{30 \text{ kN}}$$
(6) [CO2] [PO3]
$$F^{2m} * 3m + 4m + \frac{1.5}{m} * \frac{2.5}{m} * 4m$$

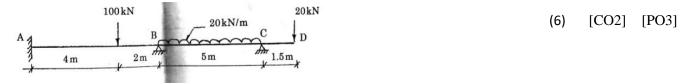
Marks

[CO#] [PO#]

[CO3] [PO2]

[CO3] [PO2]

4. Analyze the continuous beam shown in fig: by moment distribution method and draw the SFD and BMD. Take EI= constant.



- 5. A parabolic two hinged arch has a span of 30m and a rise of 5m. A concentrated load 25kN acts at 10m from the left support. The second moment of area varies as the secant of the inclination of the arch axis. Calculate the horizontal thrust and reactions at the hinge. Also calculate maximum BM. at the section.
- 6. A suspension cable 80 m span and 12m dip is stiffened with a two-hinged girder. The girder carries a dead load of 10 kN/m over the entire span and a concentrated load of 600 kN at 50m from the left support. Determine the maximum tension in the cable and the SF and BM at a section 35 m from the left support.
- A two span continuous beam ABC is fixed at A and simply supported over the supports B and C. AB=6m and BC=4m. Moment of inertia is constant throughout. A single non concentrated central load of 20 kN acts at 2m from A (6) [CO4] [PO3] and a single concentrated central load of 60 kN act on BC. Analyze the beam by force method and draw the BMD and SFD.

8.	A two span continuous beam ABC fixed A and supported B and C. AB=7m and BC=4m. Moment of inertia is constant throughout. A single non concentrated central load of 12 kN acts at 3m from A and a single concentrated central load of 11 kN act on BC. Analyze the beam by stiffness method and draw the BMD and SF.	(6)	[CO4]	[PO3]
9.	Determine the shape factor of a T-section beam of flange dimension 100 x12mm and web dimension 138 x12mm thick.	(6)	[CO5]	[PO2]
10.	A uniform beam of span 5m and fully plastic moment M_p is simply supported at one end and rigidly clamped at other end. A concentrated load of 20 kN may be applied anywhere within the span. Find the smallest value of M_p such that collapse would first occur when the load is in its most unfavorable position.	(6)	[CO5]	[PO3]

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