Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC SEM-III Winter Examination-Dec-2011

Subject code: X30603 **Subject Name: Structural Analysis-II**

Date: 17/12/11 **Total Marks: 70** **Time:2:30pm to 5:00pm**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define distribution factor, carry over factor and relative stiffness with illustration.	**04**
	(b)	Analyze the Beam shown in the **figure (1)** by moment distribution method and draw SF and BM diagram.	**10**
Q.2	**(a)**	Solve the Beam shown in **figure (2)** by stiffness method and draw SFD and BMD.	**07**
	(b)	Solve the Frame shown in **figure (3)** by flexibility method and draw bending moment diagram.	**07**
		OR	
	(b)	Solve the beam shown in **figure (1)** by flexibility method and draw SFD and BMD.	**07**
Q.3	**(a)**	Explain Principle of superposition and Maxwell's reciprocal theorem	**04**
	(b)	Draw ILD for continuous beam as shown in **figure (4)** for R_A ,R_B & R_C using first principle and hence draw ILD for Shear force at D.	**10**
		OR	
Q.3	**(a)**	Compare Curved arch elements with beam elements	**04**
	(b)	Draw ILD for Bending Moment at point D for the beam shown in **figure (4).**	**10**
Q.4	**(a)**	Enlist various methods for obtaining buckling load for a column and explain any one.	**04**
	(b)	Determine the minimum diameter of a hollow cylindrical cast iron column is 4.5 m long with one end fixed and other hinged and internal diameter = 0.65 times the external diameter. Column has to carry a safe load of 250 kN with factor of safety as 3. Take ultimate crushing stress =550MPa, rankine's constant = 1/1600.	**10**
		OR	
Q.4	**(a)**	Define buckling and use basic principle to derive the buckling load for a column hinged at both ends.	**04**
	(b)	A symmetrical three hinged circular arch has a span of 20 m and central rise of 5m. A 20 kN load acting at 4m from the central hinge. Find the reactions and maximum positive and negative bending moment.	**10**
Q.5	**(a)**	Differentiate between Flexibility and Stiffness.	**04**
	(b)	Solve the beam shown in the **figure (5)** by slope-deflection method and draw SF and BM diagram.	**10**
		OR	
Q.5	**(a)**	Differentiate between slope deflection method and Moment distribution method.	**04**
	(b)	A cable of horizontal span 20m is to be used to support 6 equal loads of 40kN each at 3m spacing. The central dip of the cable is limited to 1.5m .Find the length of the cable required and also it's sectional area if safe tensile stress is 700MPa.	**10**

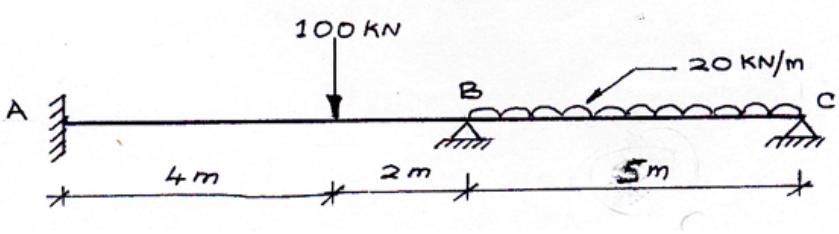


Figure (1)

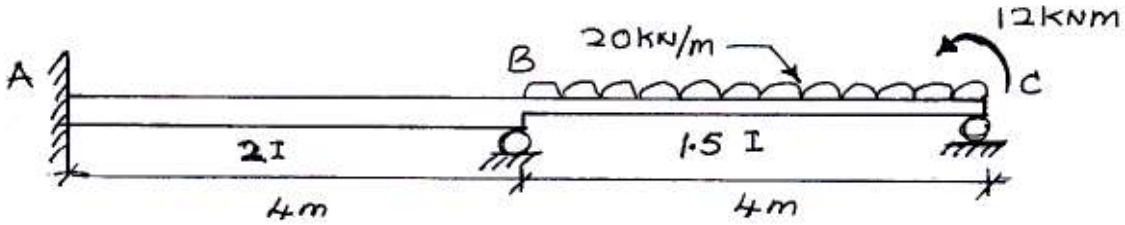
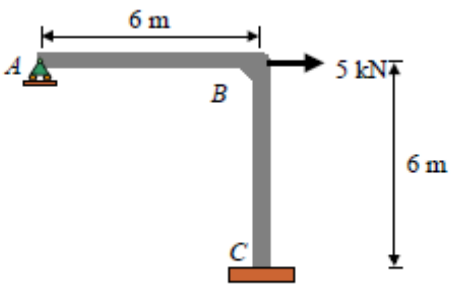


Figure (2)



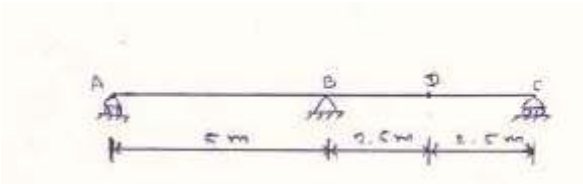


Figure (4)

Figure (3)

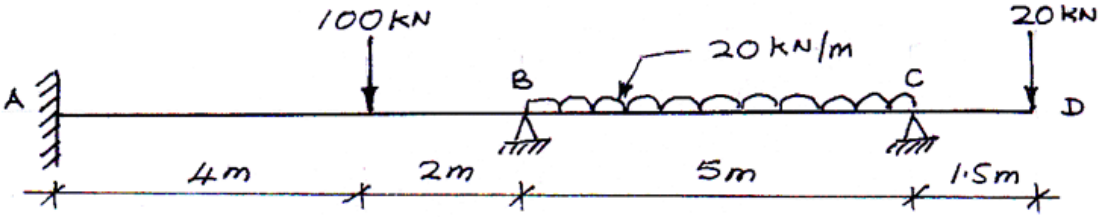


Figure (5)