Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. IST Semester–Remedial Examination – July- 2011

Subject code: 712005N

Subject Name: Basic Concepts of Structural Behaviour

Date:13/07/2011 **Time: 10:30 am – 01:00 pm**

Total Marks: 70

Instructions:

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

Q.1 **(a)** What are the Basic issues in the analysis and design of structures? Explain in Brief Structural Stability. **07**

(b) What are Funicular Structures? Explain their basic characteristics and their structural Behaviour. **07**

Q.2 **(a)** Derive the relations between Load, shear and Moment in structures. Give the relation of moment diagram to deflected shape of a structure. **07**

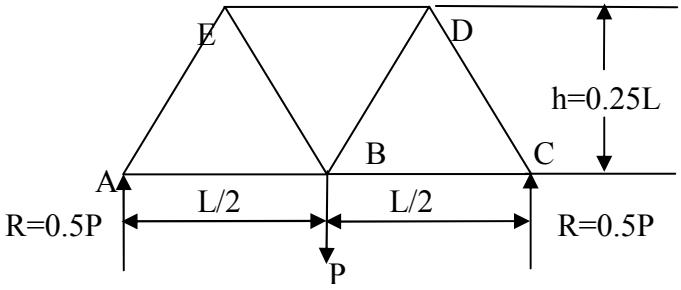
(b) What are the Mechanical Properties of Materials? Explain them in brief. **07**

OR

(b) What are the Analysis and Design criteria for determining whether the given structure is acceptable for use? Explain the several steps involved in the analysis and design process. **07**

Q.3 **(a)** Explain Modeling the structure? Explain it with idealized models with figures. **07**

(b) Determine all the member forces in the pin connected truss shown in fig . **07**



OR

Q.3 **(a)** How do categorize Cable structures? Explain the general Principles of design for them. **07**

(b) Give the comparison between fixed two hinged and three hinged arches. **07**

Q.4 **(a)** What are the various issues involved in the analysis of Beams. **07**

(b) Determine the critical buckling load for 50.8mm x 50.8 mm steel column that is 4572mm long and pin-ended. Assume that $E=0.204 \times 10^6$ N/mm^2.For what length will the square column begin to crush rather than buckle i.e what is the transition length between short-and long-column behavior for this specific member? Assume yield stress of steel $Fy=248$ N/mm^2 . **07**

OR

Q.4	**(a)**	Give the comparison between Plates, Grids and Space Frames. Also explain the general objectives for the design of Plates, Grids and Space Frames.	**07**
	(b)	Explain in detail the Structural Behaviour of folded Plate Structures.	**07**
Q.5	**(a)**	Mention the Basic Surface Geometries with neat figures. Explain the types of forces in Spherical shells with mathematical expressions.	**07**
	(b)	Explain the behavior of translational and ruled surfaces. Explain in detail the behavior of Hyperbolic Paraboloid shells.	**07**

OR

Q.5	**(a)**	Write a short note on Prestressing and Post-tensioning	**07**
	(b)	What are the general design principles f Beams.	**07**

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