GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V(OLD) EXAMINATION – SUMMER 2022

Subject Code:150605   **Date:02/06/2022**

Subject Name:Structural Analysis - III

Time:02:30 PM TO 05:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Analyze the beam shown in **Fig.01** by stiffness method.	**07**
	(b)	Analyze the frame as shown in **Fig.02** by flexibility method	**07**
Q.2	**(a)**	Derive an expression for M_ϕ and T_ϕ for a curved beam fixed at the ends.	**07**
	(b)	A spherical dome with a span of 15 m and central rise of 3m has all inclusive load of 10 kN/m^2. calculate all the stresses at the mid height.	**07**

OR

	(b)	Differentiate between straight beam and curved beam.	**07**
Q.3	**(a)**	Derive an expression for stresses in conical dome subjected to concentrated load at the vertex.	**07**
	(b)	A roof of a hall having diameter 20m is to be covered by a conical dome of 100 mm thickness and 4 m rise. Assuming live load and other loads as 1.5 kN/m^2, calculate stresses in the dome.	**07**

OR

Q.3	**(a)**	Derive an expression for stresses in spherical dome subjected to concentrated load at crown.	**07**
	(b)	Determine the shape factor of a triangle which is symmetrical about its neutral axis.	**07**
Q.4	**(a)**	State and explain the basic assumptions made in the plastic theory.	**07**
	(b)	Derive an expression for Meridional thrust and hoop force for a spherical dome subjected to UDL.	**07**

OR

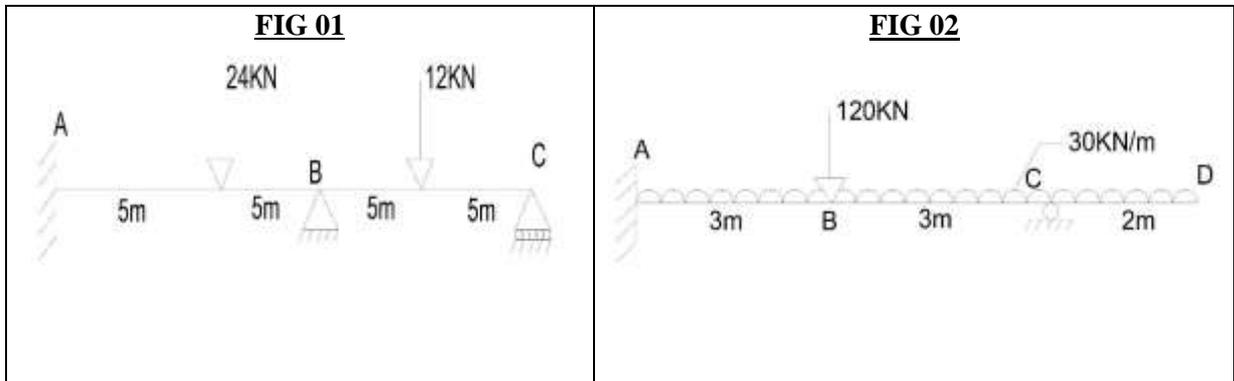|			
Q.4	**(a)**	Explain type of domes with neat sketches and state their uses	**07**
	(b)	Define the following terms: Dome, Shape factor, Load factor, collapse load, Plastic hinge, Released structure, Restrained structure.	**07**
Q.5	**(a)**	Differentiate between stiffness method and flexibility method	**07**
	(b)	Explain the concept of plastic analysis and design	**07**

Q.5 **(a)** Derive an expression for S.F. and B.M. at support for a circular beam **07**
supported symmetrically

(b) Give the uses of curved beam. **07**

FIG 01	**FIG 02**

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