Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE Arch. – SEMESTER - I • EXAMINATION – WINTER 2014

Subject Code: 1015004 **Date: 26-12-2014**

Subject Name: Structure-I

Time: 10:30Am to 12:30 Pm **Total Marks: 50**

Instructions:

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

Q.1 **(a)** Give the importance of structure design in Architecture. **05**

(b) List out various structural members in building and explain following with neat sketch: **05**

1) Foundation 2) Beam 3) Column 4) Slab

Q.2 **(a)** What are the different types of structures and differentiate between Load bearing structure and Framed structure. **05**

(b) Define following: (with sketches) **05**

1) Dead Loads 2) Law of Parallelogram 3) Composition of Forces

OR

(b) Define following: (with sketches) **05**

1) Wind Loads 2) Lami's Theorem 3) Resolution of Forces

Q.3 **(a)** Define the following terms with suitable example: **04**

1) Centre of Gravity 2) Centroid

3) Moment of Inertia 4) Radius of Gyration

(b) Determine the Moment of Inertia about both the axis of a channel section, having size as given below: **06**

Depth of the section = 500 mm, Width of the flange = 250 mm, Thickness of the flange and web = 20 mm

OR

(b) Determine the Moment of Inertia about both the axis of an 'I' section, having size as given below: **06**

Depth of the section = 500 mm, Width of the flange = 250 mm, Thickness of the flange and web = 20 mm

Q.4 **(a)** Define following with suitable examples and sketches: **04**

1) Equilibrium condition 2) Resultant

3) Moment 4) Couple

(b) Calculate the resultant force using Law of Parallelogram for given condition: P = 10kg force is acting at an angle 45˚ and Q = 20kg force is acting at an angle of 120˚ with respect to positive X-axis. **06**

OR

(b) By Applying the Lami's Theorem, Calculate forces P and Q when weight of 50 kg is suspended acting vertically downward. P force is acting at an angle of 30˚ and Q force is acting at an angle of 150˚ with respect to positive X-axis. **06**

Q.5 **(a)** List out the different supporting system. **02**

(b) Determine reaction at support A and B. A 5 meter simply supported beam carrying one point load of 20 kN acting at a distance of 2 meter from the left end A and UDL of 10 kN/m intensity over the whole beam. **08**

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