

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – WINTER • 2014

Subject Code: 180604**Date: 27-11-2014****Subject Name: Structural Design-II****Time: 02:30 pm - 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. Use of IS:800, IS-875, IS:456, IS:3370, SP-16 and steel table is permitted.
5. If not specified, use M20 grade of concrete and FE 415 steel for RCC and FY=250MPa for steel.

- Q.1 (a)** A simply supported welded plate girder of span 25m is subjected to service load of 60kN/m UDL and two fixed point loads of 250 kN each spaced at 8.5m from each supports. Design the plate girder cross section. Provide all required checks for cross section as per IS code provision. Apply curtailment of flanges. **14**
- Q.2 (a)** Design stiffener under concentrated loads for plate girder designed in Q.1. **07**
(b) Explain with sketches basic structural configurations of steel towers. **07**
OR
(b) State and explain in brief loads acting on chimneys. **07**
- Q.3** Design a suitable section for gantry girder for the following data: **14**
Crane capacity = 250 KN, Span of the crane girder = 8 m, Self weight of the crane girder excluding trolley = 200 KN, Self weight of the trolley = 50 KN, Minimum hook approach = 1.25 m, Wheel base of crane = 3.5 m, Self weight of rail section = 300 N/m. Assume no lateral restraining along the span. Provide checks for B.M and deflection only.
- OR**
- Q.3** Prepare a typical structural lay out for G+3 storey building having 4 bays of 3 m in x-direction and 3 bays of 4 m in y-direction. Design a two way slab with one short edge discontinuous. Floor height is 3.2 m. Provide all necessary checks and neat sketch of reinforcement detailing. **14**
- Q.4** Fix the basic dimensions of intz tank to store 4 lacs litre water. Height of the staging is 20 m up to the bottom of the tank. Wind load = 1.5 KN/m^2 throughout the height. Design and detail i) cylindrical wall ii) conical dome . Use M30 & Fe415. **14**
- OR**
- Q.4** For a rectangular water tank open at top resting on ground having size 3.6 m x 8.5 m x 3 m high, design short wall and long wall .Use M30 and Fe 415. **14**
- Q.5** Fix the basic dimensions of retaining wall with the following data: Angle of repose = 32° , Unit weight of the soil = 17 KN/m^3 , height of wall above ground level = 7.5 m, safe bearing capacity of the soil = 175 KN/m^2 , coefficient of friction between the base and the soil is 0.55, Design stem slab only and Provide all necessary checks. Use M20 & Fe 415. **14**
- OR**
- Q.5** A foot over bridge is of span 22 m and pedestrian load of 4 KN/m^2 . The clear distance between two trusses is 3 m and truss height is 2.4 m. Take dead weight of truss is 2 KN/m . Assume suitable configurations of truss and design & detail a cross beam and a top chord near centre. **14**
