

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013

Subject Code: 180604**Date: 10/05/2013****Subject Name: Structural Design-II****Time: 10:30 am TO 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.
4. Use of IS:456, IS:800, IS:875, SP:16 and Steel Table is permitted.

Q.1 A simply supported welded plate girder of span 27m is subjected to service load of 50kN/m UDL and two fixed point loads of 200 kN each spaced at 9m from each supports. Design the plate girder cross section using the fy 250 steel plates. Perform all required checks for cross section as per IS code provisions. Apply curtailment of flanges. **14**

Q.2 (a) Design stiffener under concentrated loads for plate girder designed in Q.1. **07**
(b) Design bearing stiffener at support for plate girder designed in Q.1 **07**

OR

(b) Design web slice for plate girder design in Q.1 at 10m from the support using fillet weld. **07**

Q.3 A gantry girder of 6.2m span is to be designed for crane capacity of 250kN. The effective span of crane girder is 18m. Weight of crane girder excluding crab is 135kN and weight of crab is 65kN. Take clearance as 1m and wheel base as 3.0m. Choose suitable section and check the bending stresses and deflection. **14**

OR

Q.3 A foot over bridge is of span 20m and pedestrian load of 4 kN/m². The clear distance between two trusses is 3.0m and truss height is 2.0m. Take dead weight of truss is 1.10kN/m. Assume suitable configuration of truss and design & detail a cross beam and a top chord near centre. **14**

Q.4 A eight storeyed building in AHMEDABAD on plane ground has 4 bay of 5m in length and 4 bay of 4m in width. Height of each storey is 3.2m. Plot wind pressure diagram and compute nodal force at storey level, as per provisions of IS:875(part-III). **14**

OR

Q.4 Draw a typical layout of a G+3 residential building. Prepare structural layout and plot load distribution diagrams for typical floor. Design and detail a typical continuous beam or a typical column of the chosen building. **14**

Q.5 For a cantilever retaining wall of height 5.0m, fix the basic dimension of structural elements and carryout stability analysis. Design and detail only stem of the retaining wall. The unit weight of soil to be retained is 16 kN/m². The SBC of foundation soil is 22 kN/m². Take angle of repose as 28° and friction between foundation soil & base concrete as 0.4. **14**

OR

Q.5 Decide the suitable shape of container for an Elevated Storage Reservoir (ESR) to store 3.0 lakhs liters water. Fix the basic dimension of chosen container. Design and detail the wall of the container. **14**
