

MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL

#### A Constituent Institution of Manipal University

# II SEMESTER M.TECH. (STRUCTURAL ENGINEERING) END SEMESTER EXAMINATIONS, APRIL/MAY 2017 SUBJECT: ADVANCED DESIGN OF STEEL STRUCTURES [CIIE 5263]

### **REVISED CREDIT SYSTEM**

## (20/06/2017)

Time: 3 Hours

MAX. MARKS: 50

#### Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitable assumed, *IS800-2007*, *SP-6*, *IS456-2000 permitted*.
  All plates are Fe410(250) Grade and bolts are grade 4.6

1.	Design a simply supported welded plate girder for a bridge deck beam with clear span of 24m subjected to a maximum factored bending moment of 4200kN-m and a maximum factored shear force of 700kN using thin web plates. Use post critical design procedure. Girder is laterally restrained.	12.5
2.	Design a pressed steel water tank to store 1.5lakhs litres of water. Also design supporting exterior secondary beam. Assume weight of the plates as1 5mm=86kg, 6mm=112kg, 8mm=138kg, for 1.25m x 1.25m plates. Draw FBD of all the Bearers and supporting tower need to be designed.	12.5
3A.	Find the collapse load or a continuous beam shown in fig Q.No 3A under applied factored load. A1so Design the minimum section required.	7.5
3B.	Design a slab base for a industrial column carries a factored axial load 600kN and clockwise moment 50kN-m at the base. Assume concrete pedestal of grade M25. Column ISHB250@51kg/m	5
4.	Design a composite bridge deck with reinforced concrete slab and steel shear connector to cover a span 20 m. Clear width of roadway 8.0m, footpath 1.2m on either side, spacing of the main girder 2.0m centre to centre. Use M20 grade concrete and Fe415 steel, rolled steel sections Assume I.R.C. class AA tracked vehicle. (Live load $m_1$ =.082 and $m_2$ =.016, dead load $m_1$ =.05, $m_2$ =.007).	12.5

200 2m 2m 2m 2m 2m A for the A Fig. U.NO. 3A