Reg. No.										

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

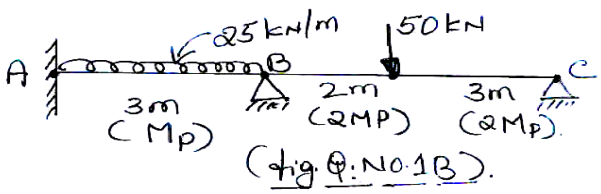
(/ /2017)

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*

1A.	Design a simply supported welded plate girder for a bridge deck beam with clear span of 30m subjected to a maximum factored bending moment of 5000kN-m and a maximum factored shear force of 670kN using thin web plates. Use tension field design procedure (τ_b = 45.15 N/mm^2. Girder is laterally restrained.	**8**
1B.	Find the collapse load or a continuous beam shown in fig Q.No 1B under applied factored load.	**4.5**
2.	Design a pressed steel water tank to store 90000 lakhs litres of water. Also design supporting main beam. Assume weight of the plates as 5mm=86kg, 6mm=112kg, 8mm=138kg, for 1.25m x 1.25m plates. Draw FBD of all the Bearers. (Supporting tower need not designed).	**12.5**
3A.	Explain plastic hinge concept, shape factor and load factor used in plastic analysis.	**4.5**
3B.	Check the design safety of an industrial steel column ISHB 250@51.0 kg/m(section is semi compact for bending about Z axis) 3.6m effective length subjected to factored axia load 600kN, moment(Mz) at the top 55 kN-m, moment (Mz) at the bottom 30 kN-m. Assume design compressive strength of the column as 1000kN.	**8**
4.	Design a composite bridge deck with reinforced concrete slab and steel shear connector to cover a span 16 m. Clear width of roadway 10.0m, footpath l.2m on either side, spacing of the main girder 2.0m centre to centre. Use M_{25} grade concrete and Fe415 steel, rolled steel sections Assume I.R.C. class AA tracked vehicle. (Live load m_1=.086 and m_2=.017, dead load m_1=.05,m_2=.006).	**12.5**



(Fig. Q.No 1B).