Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL

(A constituent institution of MAHE, Manipal)

II SEMESTER M.TECH. (STRUCTURAL ENGINEERING)
END SEMESTER EXAMINATIONS, APRIL/MAY 2018

SUBJECT: ADVANCED DESIGN OF STEEL STRUCTURES [CIE- 5263]
REVISED CREDIT SYSTEM

(/ 04/ 2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- **Missing data may be suitable assumed. I*S800-2007,SP-6, /8456-2000 permitted***

All plates are Fe410(250) Grade and bolts are grade 4.6

1A.	Design a simply supported welded plate girder with intermediate stiffeners for a bridge deck beam with clear span of 26m subjected to a maximum factored bending moment of 4000kN-m and a maximum factored shear force of 615.5 kN using thin web plates. Use post critical method. Also do the check for deflection and design end bearing stiffener. Girder is laterally restrained and design of intermediate stiffeners not required. Stiff bearing width 200mm.	**8.5**
1B.	Find the collapse load for a portal frame shown in fig.QNo IB. under applied factored loads.	**4**
2.	Design a pressed steel water tank to store 100000 lakh liters of water. Also design heavily loaded interior secondary 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 and supporting tower need not be 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 a industrial steel column ISHB 250@51.0 kg/m(section is semi compact for bending about Z axis) 3.2 m effective length subjected to factored axial load 500kN, moment(Mz) at the top 30 kN-m, moment (Mz) at the bottom 48kN-m.	**8.0**
4.	Design a composite bridge deck with reinforced concrete slab and steel shear connector to cover a span 18.4 m. Clear width of roadway 10.0m, footpath 1.2m on either side, spacing of the main girder 2.2mcentre to centre. Use M20 grade concrete and Fe415 steel, rolled steel sections Assume IRC class AA tracked vehicle. (Live load m_1=.085 and m_2=.0 16, dead load m_l=.052, m_2=.006).	**12.5**

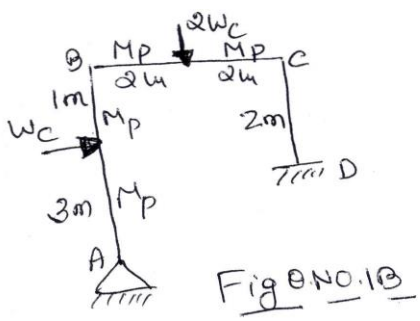

Fig Q.NO.1B