Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

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(A constituent institution of MAHE, Manipal)

VI SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL/MAY 2018

SUBJECT: ADVANCE DESIGN OF STEEL STRUCTURES (CIE 4013)

REVISED CREDIT SYSTEM

(26/ 04/ 2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- Missing data may be suitable assumed.
- Usage of IS:800 -2007 and SP-6is permitted.

Q.No		Marks	CO
1.	Design a simply supported welded plate girder using intermediate stiffener of span 18m and laterally restrained throughout. It has to support a uniform service load **50kN/m** throughout the span exclusive of self-weight. Use **Fe 4410** and yield stress of steel is **250MPa.** Design cross section dimensions, check for end panel and design intermediate stiffener.	**10**	**CO1**
2.	Design a gantry girder to be used in an industrial building carrying a manually Operated overhead travelling crane, for the following data: Crane capacity **200kN,** self-weight of the crane girder excluding trolley **160 kN**, self-weight of trolley **40kN**, Approximate minimum approach of the crane hook to the gantry girder **1.0m**. wheel base **3.0m**, c/c distance between gantry rails **14m**, c/c distance between columns **8m**, self-weight of rail section 300N/m, diameter of the crane wheels **100mm**, steel grade **Fe 410**, self-weight of girder **2kN/m**. **Check for combined local capacity** (γ_{mo}=1.1, γ_{mw}=1.5, γ_{ml}=1.5).	**10**	**CO2**
3A.	Check the fatigue strength for gantry girder designed, for the following data: The crane operates for **240** days per year, the working hours **9am to 5 pm**, maximum number of trips per hour **4**, design life **50** years (**Intermittent weld** is used for **I** and Channel section). The max moment **400kN-m**, max shear force **250 kN**. Use section ISMB 600@ 122.6 kg/m and ISMC 300@35.8 kg/m γ_{mft}=1.15.	**05**	**CO3**
3B.	Design laterally unsupported simply supported beam for the given loads, Live load **l.81kN/m** and Dead load **1.2kN/m** steel grade **Fe 410** refer **Fig.1, Fy= 250N/mm^2**.	**05**	**CO3**
4.	Design a Biaxial industrial column of unsupported length **4.5m** height subjected to following loads and moments: Factored axial load **700kN**, Factored moment Mz @ top **20kN-m**, Factored moment Mz @bottom **40kN-m**, Factored moment My @ top **5 kN-m**, Factored moment My @ bottom **10 kN-m**. Assume effective length of column as **0.8L**, use **Fe410** steel grade (Fy = **250 N/mm^2**).	**10**	**CO4**

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5A.	Explain briefly about axially loaded compression members of Light gauge steel members.	**05**	**CO5**
5B.	Write short note on prefabricated building (steel) structures.	**05**	**CO5**

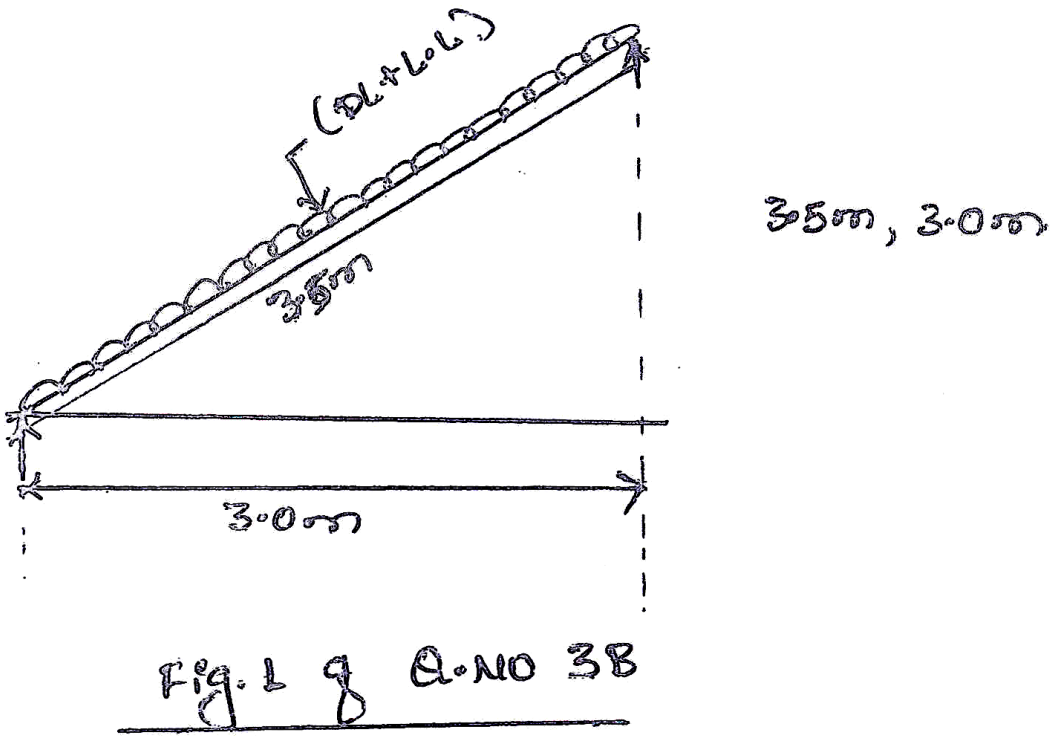

Fig. 1 g Q.NO 3B