Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: BASIC STRUCTURAL STEEL DESIGN [CIE 3102]

REVISED CREDIT SYSTEM

(/ /2016)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions. Use of IS800-2007 and SP-6 is Permitted
- Assume suitable data if missing. Answer all the questions: All plates are Fe4l 0(250) grade and bolts are grade 4.6 unless specified in the question.

1A.	Write any 3 advantages of welded construction over bolted construction	**3**	**CO1**
1B.	Calculate the size of the fillet weld for the bracket 10mm thick connected to the flange of column of thickness 8mm as shown in fig Q.No.l (B) to carry a factored load of 80 kN.	**7**	**CO1**
2A.	Explain different modes of failures in tension members.	**3**	**CO2**
2B.	Determine the tensile strength of a roof truss member 100x75x 10 mm .The long leg is connected to 12mm thick gusset plate with 20mm dia 4.6 grade bolts in one row. six number of bolts are used with edge/end distance 40mm and a pitch *50mm*	**7**	**CO2**
3A.	What are the design considerations adopted in battened columns.		
3B.	Design a column section to carry working axial load 4250 kN, the column is 4.2m long and is effectively held in position at both ends but restrained against rotation at one end only. ISHB450@92.5 kg/m rolled steel section is available. If required load carrying capacity can be enhanced by providing steel plates at both sides of the flanges.	**7**	**CO3**
4A.	Design a suitable slab base for a column ISHB 400 @ 82.2 kg/m to transfer the compression load to its capacity about minor axis if effective length of column is 4.0m. Using welded connection between base plate and column. Assume the column ends are milled/machined. The foundation is in M25 grade concrete. Draw a neat sketch of the design details.	**7**	**CO4**
4B.	Draw a neat sketch and label various elements of column splice, if the column sizes are different.	**3**	**CO4**
5A.	Calculate the safe uniformly distributed load on an ISMS 400 @61.6 kg/m beam spanning over 3.5m simply supported. The beam is laterally unsupported and the ends are restrained against rotation and warping.	**7**	**CO5**
5B.	With the help of neat sketch explain with reasons any two type of stiffeners provided in plate girders.	**3**	**CO5**

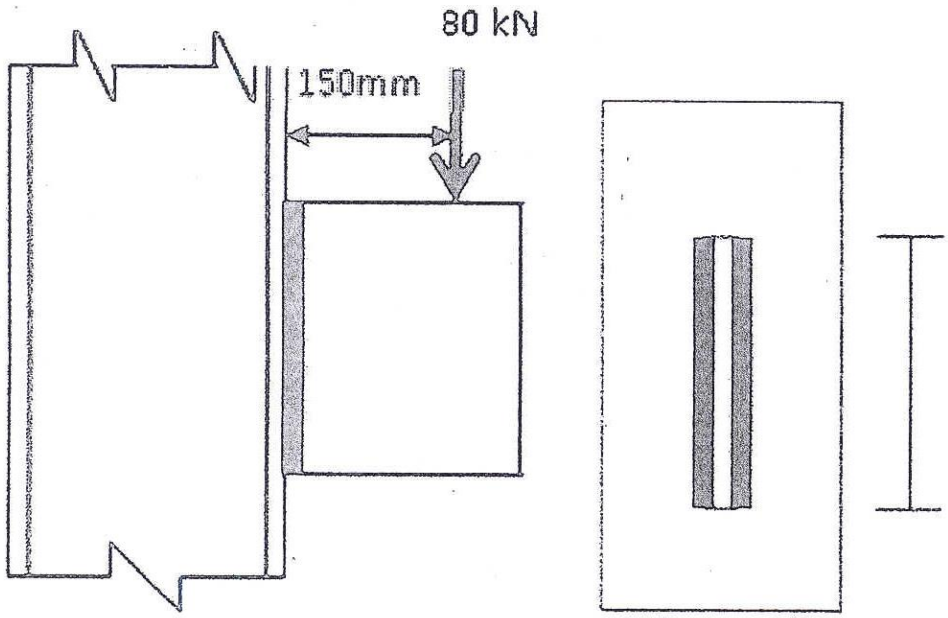

fig Q.No.1(B)