Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

V SEMESTER B.TECH (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: STRUCTURAL DESIGN II [CIE 303]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** the questions.
- Adopt Fe 410 grade steel and bolts of grade 4.6, unless it is specified.
- Use of IS 800-2007 & steel tables are allowed.

1A.	Write advantages of welded connections over bolted connection.	**3**
1B.	The flange of column ISHB 300 @63 kg*1m* is connected to flange of beam ISWB 350 @ 56.9 *kg/m* at an eccentricity of 300mm from the face of column flange using 7 bolts in each row (2 rows) as shown in the fig.a.No.1 (B). Find the Tensile force in the critical bolt.	**7**
2A.	A circular plate of 100 mm in diameter is welded to another rectangular plate by means of 8 mm fillet shop weld as shown in fig.Q.No.(2A).Calculate the twisting moment that can be resisted by the weld	**3**
2B.	An angle section ISA 100 x 75 x 8 mm is connected to a gusset plate of thickness 8mm. It is connected by the help of 4 -20 mm dia shop bolts @ a pitch of 60 mm and edge distance of 40 mm. Find the strength of the member in tension. Assume 100 mm side is connected at a distance of 60 mm from toe.	**7**
3A.	State the objective of classification of cross section as stipulated in IS 800-2007. Describe any one type of cross section.	**4**
3B.	Design a suitable double angle section connected on both sides of gusset plate of 12mm thick for the discontinuous strut to factored compressive load of 135kN. Also design the bolted connection	**6**
4A.	Design built up cross section for a 9m long battened bolted column with two channels placed back to back for supporting a factored axial load of 1100kN. Column is restrained in position but not in direction at both the ends. Assume bolts of grade 4.6. Connectors need not be designed.	**4**
4B.	Design a suitable flange splice plate to connect ISHB300@618N/m and ISHB *200@392.4N/m* to transfer a factored load of 600kN. Bearing surfaces are machined and use M20 bolts grade 4.6.	**6**
5.	A welded plate girder is simply supported over a span of 24 m and carries a factored superimposed load of 40kN/m exclusive of its self-weight. Assume the compression flange is laterally restrained and prevented against rotation. Design the plate girder without stiffeners. Assume stiff bearing length of 500mm. draw a Sketch of the final length	**10**

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6A.	Explain web buckling and web crippling.	**3**
6B.	Design a laterally supported beam over an effective span of 6.2m simply supported. The beam carries uniformly distributed load of 20kN/m at working loads. Assume stiff bearing length of 100 mm. Adopt a suitable rolled beam section. The beam is restrained torsion at the ends.	**7**