Reg. No.										

MANIPAL UNIVERSITY

FIFTH SEMESTER B. ARCH. DEGREE EXAMINATION – NOVEMBER 2015

SUBJECT: ARC 309 - STRUCTURES V

(2010 & 2007 SCHEME)

Tuesday, November 24, 2015

Time: 10:00 – 13:00 Hrs. Max. Marks: 50

- **Answer any FIVE FULL questions.**
- **Use of IS 800 and Steel Hand Book is permitted.**
- **Assume Yield stress of steel is 250MPa and Young's Modulus as 2×10^5 MPa**
- **Any missing data may suitable be assumed.**

1A. **Define:**

i) Edge distance
ii) Rivet value
iii) Throat of the weld
iv) Pitch

1B. A Single angle discontinuous 90 × 60 × 8 mm strut of a roof truss has a length of 2.4m between the points of intersection. It is connected by double rivets at each end. Calculate the load carrying capacity of the strut.

((1 mark × 4)+6 = 10 marks)

2. Determine the load carrying capacity of steel column of channel section ISMC350@42.1kg/m with both ends fixed for lengths of:
a) 3.0m and b) 4.0m

(5+5 = 10 marks)

3. A simply supported steel beam having a clear span 6m is carrying a superimposed load of 24kN/m over entire span. The beam is laterally supported. Width of the support at each end is 200mm. Design the beam for flexure and check for shear and deflection. Draw a neat sketch of the section and mention its properties.

(10 marks)

4. Design a riveted joint for a strut comprising of 2ISA 100 × 90 × 10 mm riveted on opposite sides of a gusset plate of 10mm thick and carrying an axial load of 200kN. Assume permissible shear stress of 100MPa in rivets and permissible bearing stress of 270MPa in rivets and permissible bearing stress of 300MPa in plates. Draw elevation and section of the joint.

(10 marks)

5. Design a fillet weld lap joint for two mild steel plates of size 250×10mm and 250 ×12mm. Assume permissible shear stress in fillet weld as 110N/mm^2. Draw the diagram of welding pattern.

(10 marks)

6A. Explain with the sketches different types of failures in riveted joint.

6B. List the advantages and disadvantages of steel as a structural member.

(6+4 = 10 marks)