Reg. No.										

MANIPAL UNIVERSITY

THIRD SEMESTER B. ARCH. DEGREE EXAMINATION – FEBRUARY 2016

SUBJECT: ARC 209 - STRUCTURES III

(2010 AND 2007 SCHEME)

Friday, February 19, 2016

Time: 14:00 – 17:00 Hrs. Max. Marks: 50

✍ **Answer any FIVE full questions.**

1. A fixed beam of span 8 m is subjected to a downward point load of 24 kN at mid span. Draw the SFD and the BMD. Locate the points of contra flexure, if any.

(10 marks)

2. Using Clapeyron's method analyse the beam loaded as shown in figure Q 2. Draw SFD and BMD.

(10 marks)

3. Draw SFD and BMD for the beam shown in figure Q3. Use moment distribution method to analyse the beam.

(10 marks)

4. A portal frame is loaded as shown in figure Q4. Draw the SFD and the BMD.

(10 marks)

5. A short column of rectangular cross section 200 mm × 600 mm is subjected to an eccentric force of 180 kN at bottom right corner as shown in the figure Q5. Find the stresses at all the corners.

(10 marks)

6A. An eccentric load 'P' acts on a short column of circular cross section of diameter D. Determine the allowable eccentricity if no tension is allowed anywhere in the cross section.

6B. Determine the Euler's crippling load for a long column of length 4.2 m if the cross section of the column is rectangle with dimensions 100 mm × 70 mm and Young's modulus of elasticity is 1.2×10^5 N/mm^2 .

(3+7 = 10 marks)

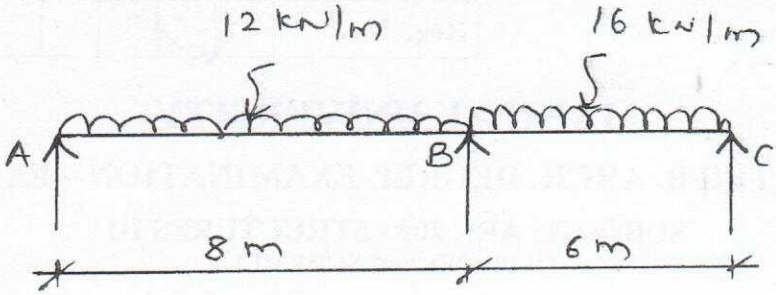


FIG Q 2

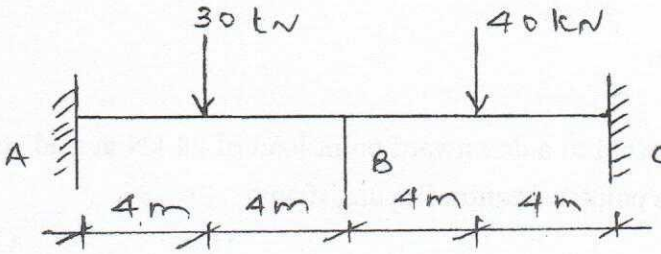


FIG Q 3

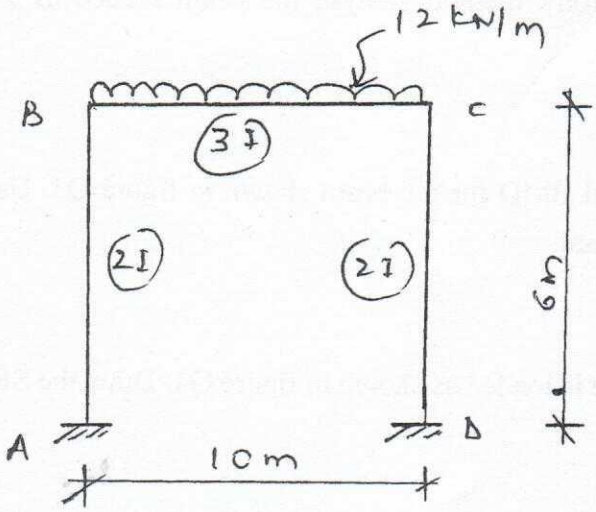
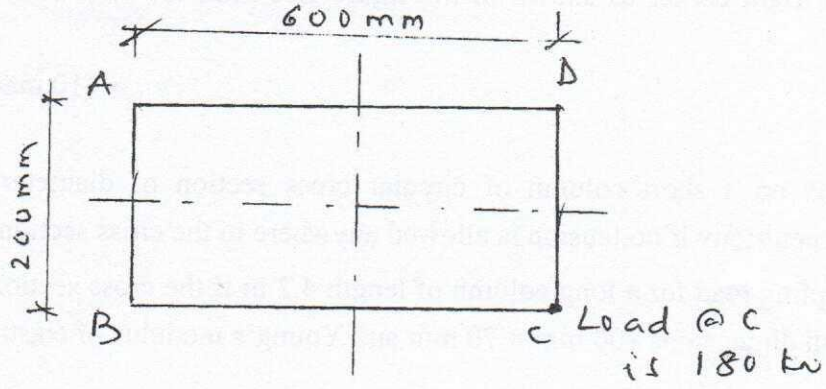


FIG Q 4



c/s of column

FIG Q 5