Reg. No.										

MANIPAL UNIVERSITY

THIRD SEMESTER B. ARCH. DEGREE EXAMINATION – NOVEMBER 2015

SUBJECT: ARC 209 - STRUCTURES III

(2010 AND 2007 SCHEME)

Monday, November 23, 2015

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

- **Answer any FIVE full questions.**
- **Answer all parts of a question. Give sketches wherever necessary.**

1. A fixed beam is loaded as shown in Fig-Q1. Draw SFD and BMD. Locate the points of contra-flexure if any.

(10 marks)

2. Analyse the continuous beam shown in Fig-Q2 using Clapeyron's method. Draw SFD and BMD.

(10 marks)

3. A continuous beam is shown in Fig-Q3. Analyse the beam using moment distribution method and draw SFD and BMD.

(10 marks)

4. A portal frame is shown in Fig-Q4. Analyse the frame using moment distribution method and draw SFD and BMD.

(10 marks)

5A. Figure Q5A. shows a short column of rectangular cross section 230mm × 540mm, subjected to an eccentric load of 200 kN at right top corner. Determine the stresses at all corners.

5B. Write the classification of column or strut according to mode of failure.

(7+3 = 10 marks)

6A. An I section joist 400 mm × 200 mm × 10 mm (Fig-Q 6A) and 6 m long is used as a column with both ends fixed. What is the Euler's crippling load for the column? Take the Young's modulus for the joist as 2.1×10^5 N/mm^2.

6B. List the Euler's formulae for long columns with different end conditions.

(7+3 = 10 marks)

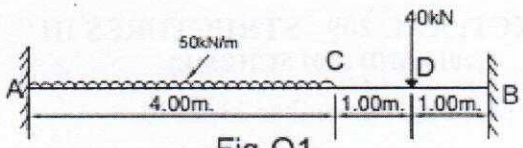

Fig-Q1.

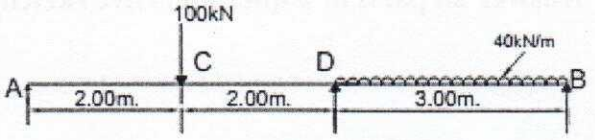

Fig-Q2.

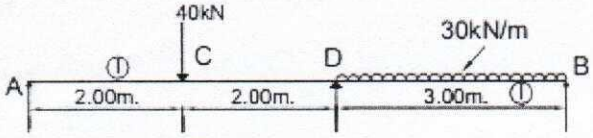

Fig-Q3.

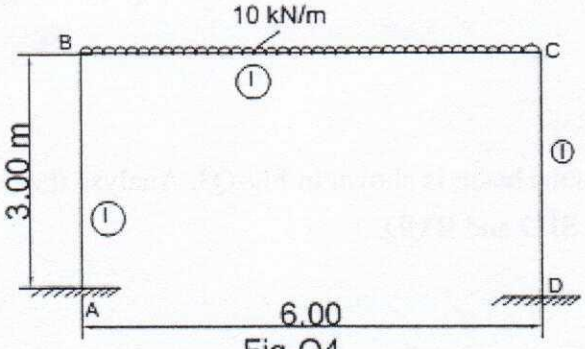

Fig-Q4.

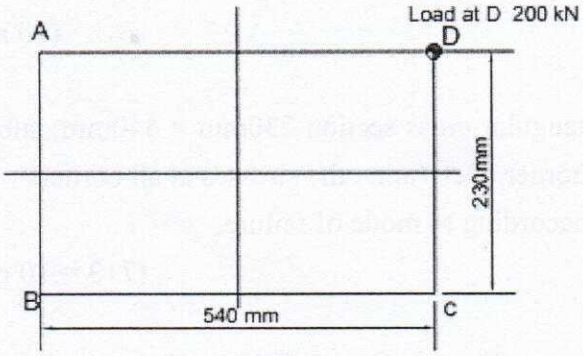

Fig-Q5A.

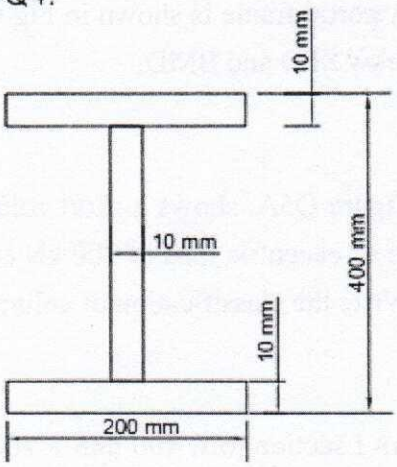

Fig-Q 6A.