Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, JUNE/JULY 2017

SUBJECT: ANALYSIS OF INDETERMINATE STRUCTURES [CIE 2202]

REVISED CREDIT SYSTEM

(/ /2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

Q.No.	Question	Marks	CO
1A.	A two hinged parabolic arch of span 32 m and rise 4 m is loaded over left half of its span with an Udl of 20 kN/m and a concentrated load of 80 kN at the crown. Determine the horizontal thrust and bending moments at salient points and draw BMD. Also find normal thrust and radial shear at the right quarter span point.	**6**	**1**
1B.	Analyze and draw bending moment diagram for the fixed shown in **figure 1B** if support B sinks by 15 mm. Take E = 200 kN/mm^2 and I = 2.75 x10^7 mm^4	**4**	**1**
2A.	Determine all the reaction components and draw BMD for the continuous beam ABCD with overhang portion DE as shown in **figure 2A** consider EI as constant. Use Three moment theorem.	**6**	**1**
2B.	Analyze the propped cantilever shown in **figure 2B** using Castigliano's theorem. Obtain the support reactions. Take EI constant.	**4**	**1**
3A.	Using Slope deflection method, analyze the portal frame shown in **Figure Q3A**, to obtain the end moments. EI constant.	**6**	**1**
3B.	In the beam shown in **Figure Q3B,** the support B sinks by 8mm. Obtain the end moments using moment distribution method, if EI = 16000kN-m^2.	**4**	**1**
4A.	Analyse for end moments the frame shown in **Figure Q4A** using Kani's method	**4**	**1**
4B.	Determine collapse load for the frame shown in **Figure Q4B**	**6**	**3**
5A.	Determine the collapse load for a beam of length L and uniform c/s, fixed at both ends subjected to an eccentric concentrated load W acting at a distance "a" from left end. Use Static method (lower bound theorem)	**5**	**3**
5B.	In the beam shown in **Figure Q5B**, draw Influence Line Diagram for (i) Reaction at B and (ii) Support moment at A using Muller-Breslau Principle	**5**	**2**

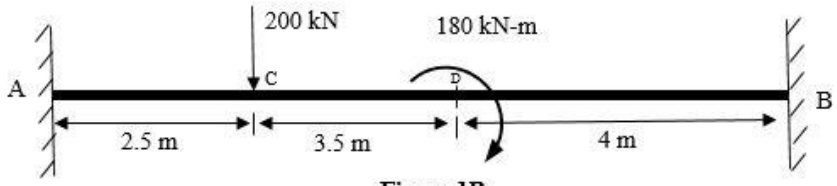

Figure 1B

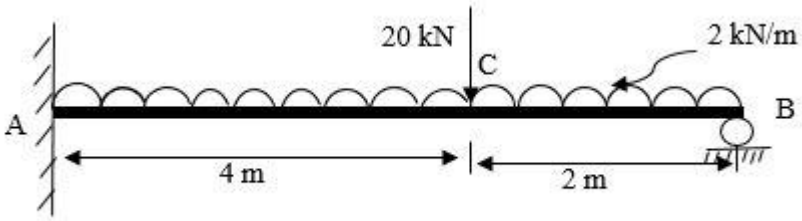

Figure 2B

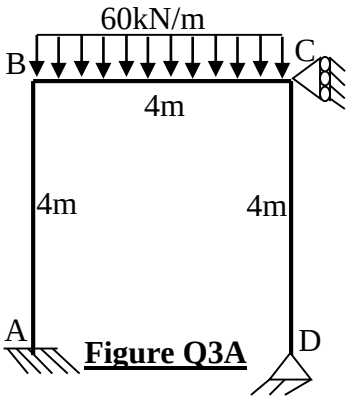

Figure Q3A

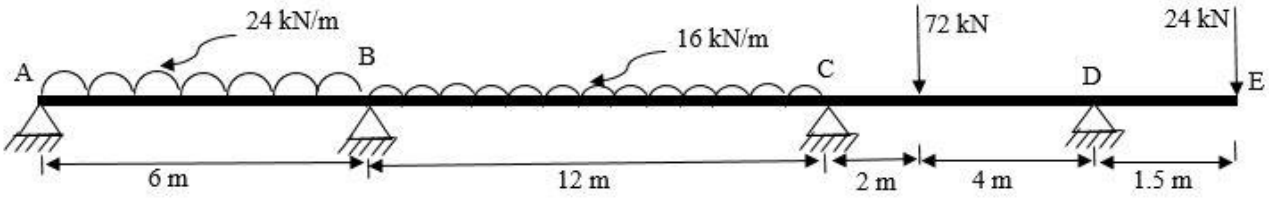

Figure 2A

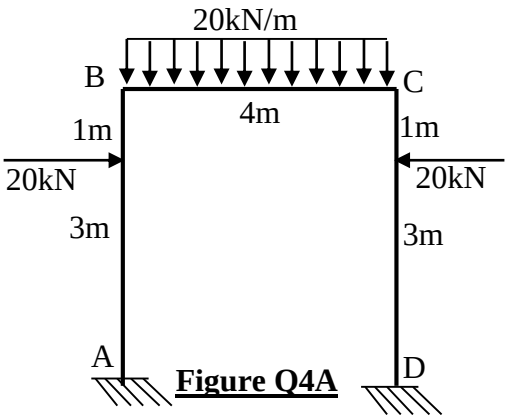

Figure Q4A

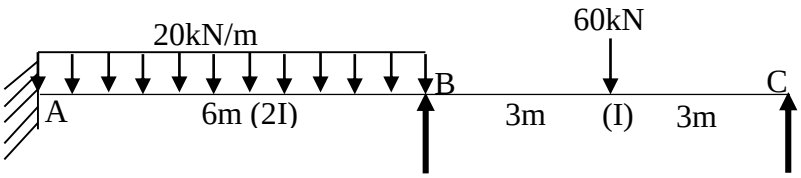

Figure Q3B

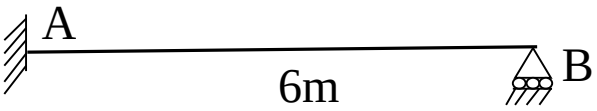

Figure Q5B

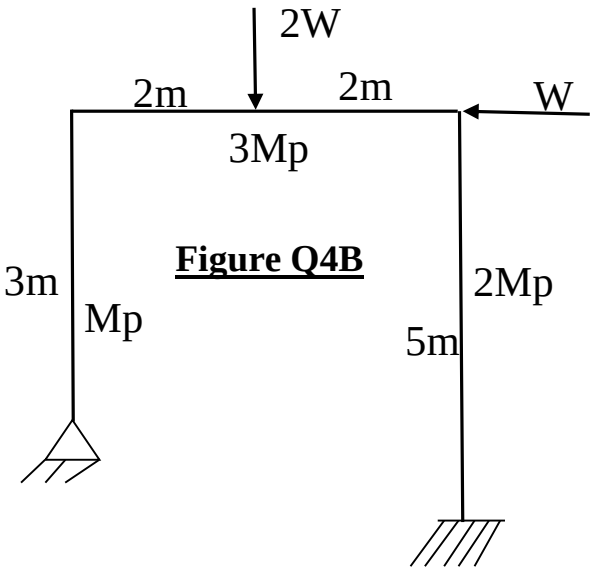

Figure Q4B