Reg. No.									

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

IV SEMESTER B.TECH (CIVIL) END SEMESTER EXAMINATIONS

APRIL 2019

SUBJECT: ANALYSIS OF INDETERMINATE STRUCTURES [CIE 2202]

Date of Exam: **26/04/2019** Time of Exam: **2:00 PM to 5:00 PM** Max. Marks: **50**

Instructions to Candidates:

- Answer ALL the questions & missing data may be suitably assumed

Q. No	Questions	Marks	CO
1A	A two hinged parabolic arch has a span of 30 m and central rise of 6 m. What must be maximum intensity of UDL acting on left half of the span, so that the horizontal thrust developed in arch support doesn't exceed 300 kN? Also, draw bending moment diagram for the arch under that load.	5	CO1
1B	Determine the reaction at the roller support for the propped cantilever beam shown in **Fig.Q1B** using Castigliano's second theorem.	3	CO2
1C	A fixed beam AB of span 5 m has a UDL of 5 kN/m throughout the span. Determine the magnitude and direction of rotation at support B, so that the fixed end moment at A becomes zero. Draw FBD of the beam. Take EI= 2000 kNm^2.	2	CO2
2A	Determine the support moments for the beam shown in **Fig.Q2A,** using three moment theorem. Draw BMD. EI is constant throughout.	5	CO2
2B	Determine the support moments for the continuous beam shown in **Fig.Q2B** by slope – deflection method, if support B sinks by 15 mm. Take EI = 3×10^4 $kN.m^2$ for all spans.	5	CO2
3A	Determine the support moments for the T-frame shown in **Fig.Q3A** by moment distribution method and draw BMD.	6	CO3
3B	Determine the support moments for the continuous beam shown in **Fig.Q3B** by Kani's rotation method.	4	CO2
4A	Draw ILD for chords, U_1L_1, L_0U_1 and U_1U_2 of the truss shown in **Fig.Q4A.**	6	CO4
4B	Draw ILD for reaction at roller support for a propped cantilever beam of span 10 m considering interval of 2 m.	4	CO4
5A	Determine the collapse load for the frame shown in **Fig.Q5A.**	6	CO5
5B	Determine the shape factor for the section shown in **Fig.Q5B.**	4	CO5

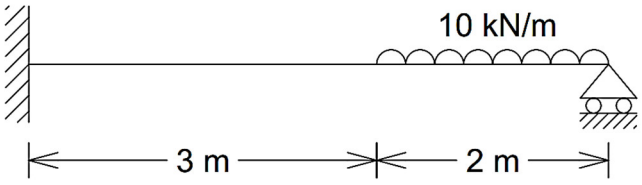

Fig.Q1B

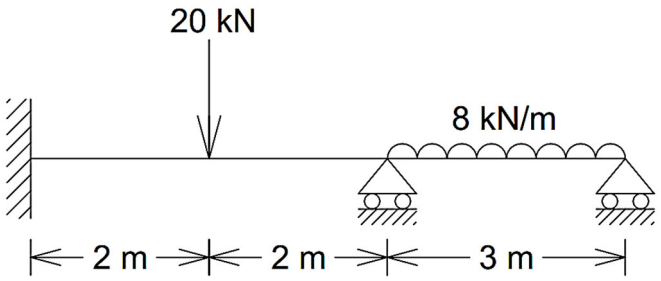

Fig.Q2A

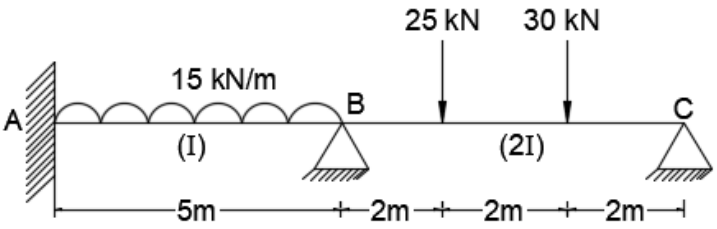

Fig.Q2B

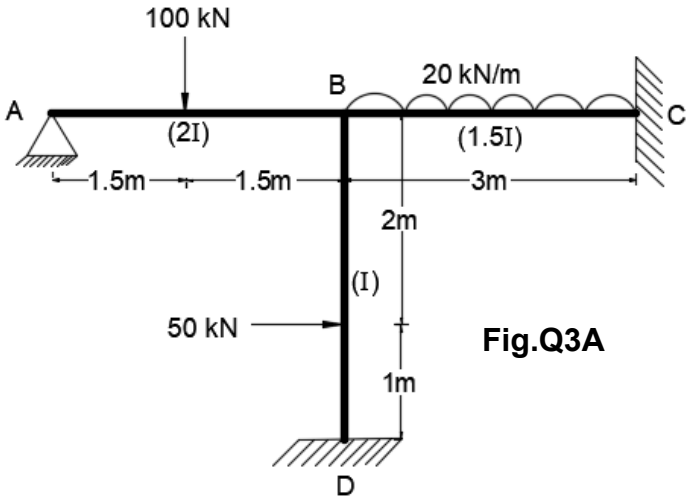

Fig.Q3A

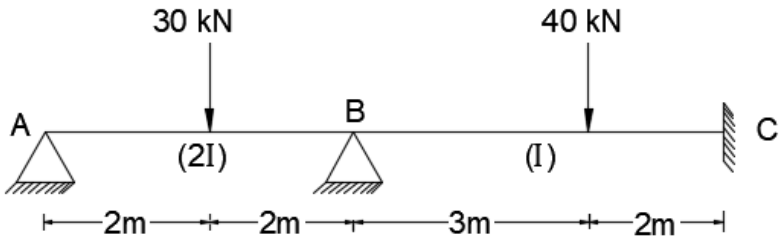

Fig.Q3B

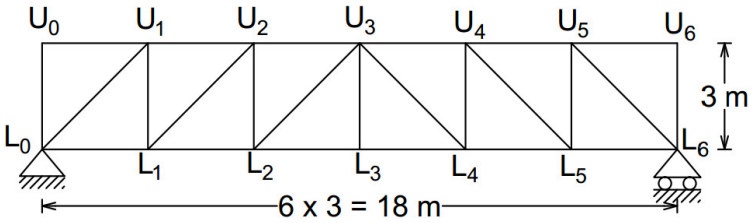

Fig.Q4A

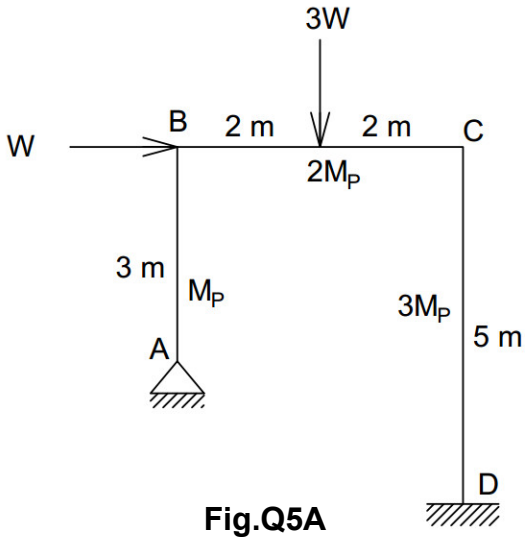

Fig.Q5A

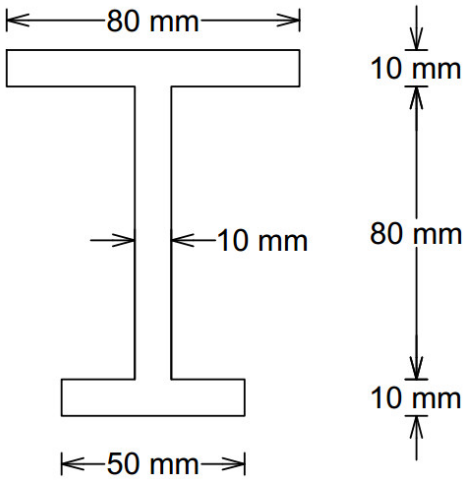

Fig.Q5B