

**B.TECH SEM – IV (2007 COURSE) (CIVIL ENGG.) : SUMMER .  
2018**

**SUBJECT: STRUCTURAL MECHANICS – I**

Day: **Saturday**  
Date: **09/06/2018**

**S-2018-2608**

Time: **10.00 AM TO 01.00 PM**  
Max. Marks: 80

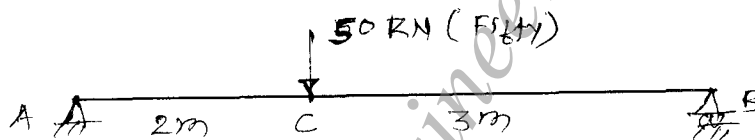
**N.B.:**

- 1) **Q. No.1 and Q. No.5** are **COMPULSORY**. Out of remaining attempt **ANY TWO** questions from each section.
- 2) Answer to both the section should be written in **SEPARATE** answer books.
- 3) Use non- programmable **CALCULATOR** is allowed.
- 4) Figures to indicate **FULL** marks.
- 5) Assume suitable data, if necessary.

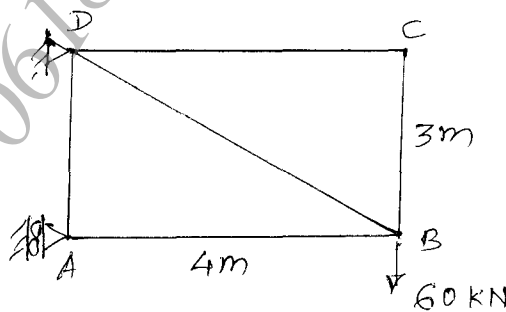
**SECTION – I**

- Q.1** a) What is degree of static indeterminacy? (04)  
b) What is Castigliano's first theorem? (04)  
c) What is Betti's law? (04)

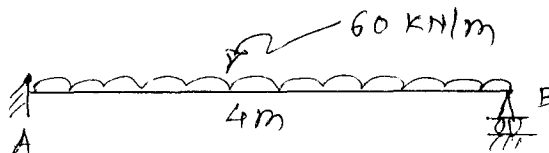
- Q.2** Calculate deflection at 'C' using conjugate beam method? (14)



- Q.3** Calculate vertical deflection of joint 'B' of truss shown in figure. (14)  
Take  $E = 200 \text{ GPa}$ ,  $A = 150 \text{ mm}^2$



- Q.4** Analyse the beam using strain energy method. (14)

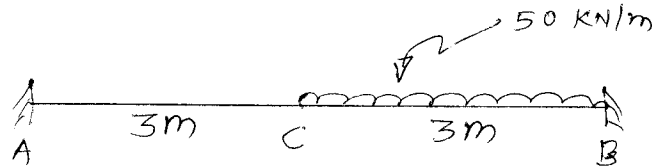


P.T.O.

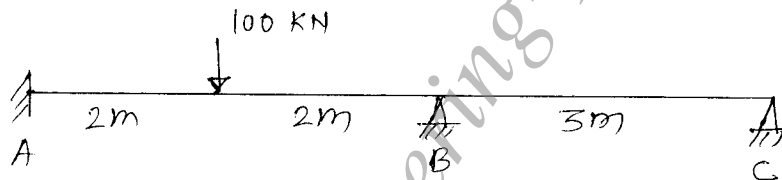
SECTION - II

- Q.5 a) What is Clapeyron's three moment theorem? (04)  
b) Draw deflected shape for any beam and frame. (04)  
c) What is relative stiffness? (04)

- Q.6 Analyse the beam shown in figure. (14)



- Q.7 Analyse the beam using slope deflection method. (14)



- Q.8 Analyse the beam shown in Q.7 using moment distribution method. (14)

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