Seat No.	

T.E. (Civil) (Semester-VI) (Revised) Examination, April - 2017
THEORY OF STRUCTURES
Sub. Code : 66873

Day and Date : Wednesday, 26-04-2017 **Total Marks : 100**
Time : 2.00 p.m. to 5.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of non-programmable calculator is allowed.**
4) **Assume suitable data if necessary.**

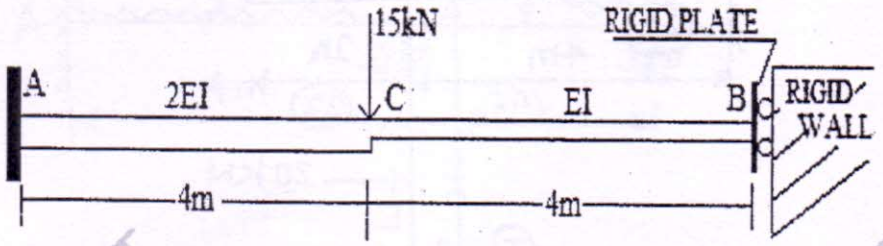
SECTION-I

Q1) a) What is 'Local Instability' of the structural system? Explain with suitable example. **[5]**

b) A propped cantilever of span 'L' is acted upon by a central point load 'P'. The prop rests on elastic support (spring) having stiffness 'K'. Determine the prop reaction. Using the expression thus obtained for prop reaction, determine the prop reaction when
i) 'K' tends to zero ii) 'K' tends to Infinity **[11]**

Q2) a) What is 'Maxwell's reciprocal theorem'? Explain it with suitable example. **[5]**

b) Analyze the beam AB fixed at A and roller supported against wall shown in fig.1 below by strain energy method. Draw SFD and BMD. Also locate the point of contra-flexure if any. **[13]**

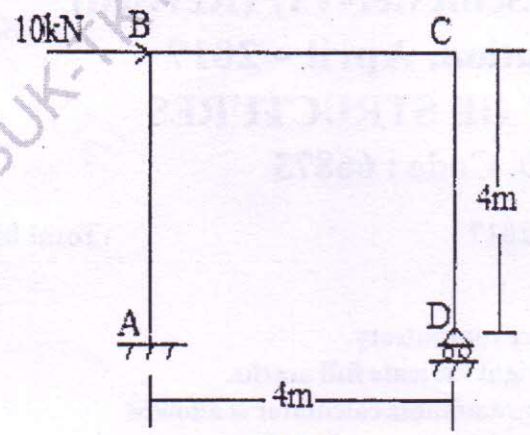


(FIG.1)

OR

P.T.O.

Q2) Analyze the portal frame shown in the fig.2 below by Castigliano's theorem. Also draw shear force and bending moment diagrams. $I_{AB}=I_{BC}=I$, $I_{CD}=2I$. **[18]**



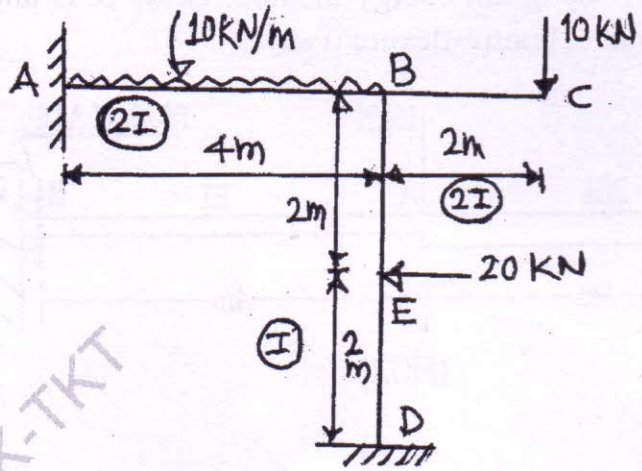
(FIG.2)

Q3) a) State and prove Claperyon's theorem of three moments in general for varying M.I. of spans and level differences between supports. **[5]**

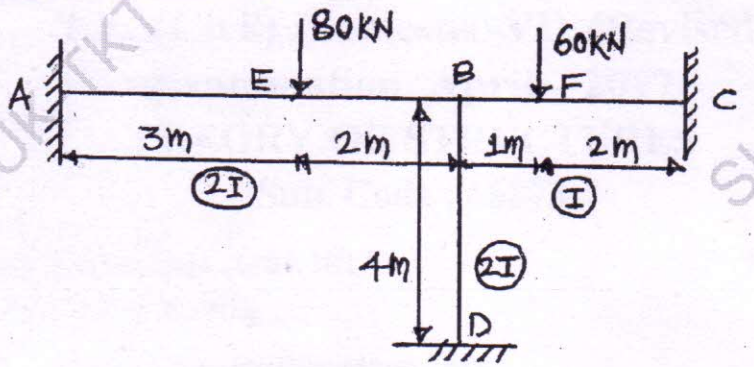
b) Analyze the two span continuous beam ABC in which AB=BC=4m, is fixed at A and simply supported at B and C. A UDL of 20kN/m is placed throughout. During loading support A settles by 10mm. Use three moment theorem. Draw SFD and BMD. Take EI= 10^4kN/m^2. **[11]**

SECTION-II

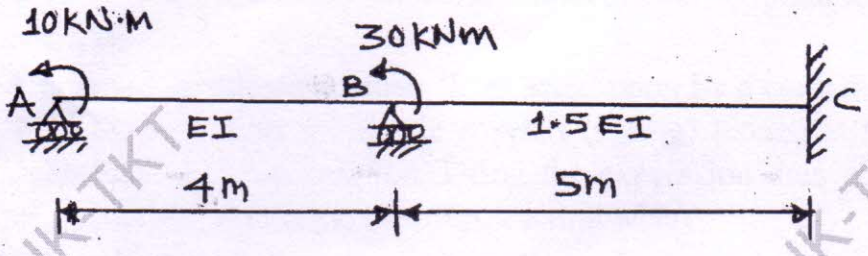
Q4) Analysis the structure as shown in fig. by Slope Deflection Method. Sketch the BMD and SFD. **[17]**



Q5) Analysis the structure loaded as shown in fig. by moment distribution method. Sketch the BMD and SFD. **[17]**



Q6) A continuous beam ABC is roller support at A and B and is fixed at C. The beam is subjected to concentrated anticlockwise moments of 10 KN.m and 30KN.m at Point A and Point B respectively as shown in fig. below. Analysis beam by Stiffness Matrix Method. Sketch the BMD. **[16]**



OR

Analysis the continuous beam loaded as shown in fig. by flexibility method. Sketch the BMD and SFD. **[16]**