QPC: RJ20MTECH039 AR 19 Reg. No

GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (First Semester – Regular) Examinations, June – 2021

MPCSE1020 - Elastic Stability and Behaviour of Metal Structures (Structural Engineering)

Time: 2 hrs Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A **(2 x 10 = 20 Marks)**

Q1. Answer **ALL** questions

a. What are the failure modes of Beam Column member?
b. Sketch load deflection characteristics of beam column
c. Sketch the buckling modes of portal frames.
d. Write the equation for St. Venant torsion
e. When will you consider the torsional flexural buckling load in the design of members?
f. Sketch the lateral buckling of simply supported rectangular beam in pure bending.
g. What are the idealizations made for limiting the analysis of thin plates?
h. State the failure modes of structural steel members.
i. Define shape factor
j. What is meant by lower bound theorem?

PART – B **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions **Marks**

2. Find out the maximum deflection, Maximum bending moment and Amplification factor of beam column subjected to uniformly distributed load thought out its length. **(6)**
3. Using Equilibrium approach, find the critical load of the column when both the ends are fixed. **(6)**
4. Find out the maximum deflection, Maximum bending moment and of beam column subjected to eccentric loading. **(6)**
5. Derive the expression for total strain energy stored in a member subjected to twisting moment. **(6)**
6. Derive the critical stress developed due to lateral buckling of a simply supported beam in pure bending. **(6)**
7. Determine the plastic moment for the beam shown in figure 1. **(6)**

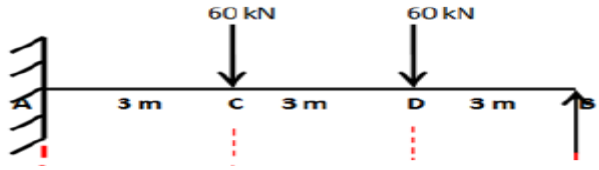

Figure 1

8. Determine the plastic moment for the beam shown in figure 2. **(6)**

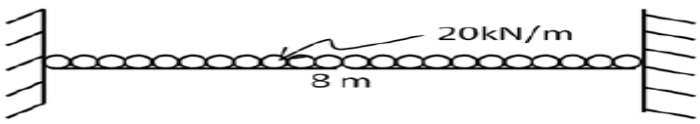

Figure 2

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