QP Code: RM23MTECH159 Reg. No | | | | | | | | | | | AY 23

GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (Second Semester) Examinations, May – 2024

MPESE2042– Advanced Steel Structures

(Structural Engineering)

Time: 3 Hrs Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 10 = 20 Marks)**

Q.1. Answer all questions	CO#	Blooms Level
a. What do you mean by gusset base?	CO1	K2
b. List the types of base plates used in practice.	CO1	K1
c. Define cleat angles	CO1	K2
d. What are shear connections?	CO2	K2
e. Explain the moment connections	CO2	K2
f. Draw the moment rotation curve for different types of connections	CO2	K2
g. Define characteristic load.	CO3	K1
h. What are end bearings?	CO3	K1
i. Define ductility.	CO4	K2
j. Draw the stress strain curve for mild steel.	CO4	K2

PART – B **(10 x 5=50 Marks)**

Answer ***ANY FIVE*** questions	Marks	CO#	Blooms Level
2. Discuss the design the slab base for the column consisting of ISHB 300 @ 58.8kg/m and carrying an axial load of 1000kN. Take the allowable bearing pressure on concrete as 4 N/mm^2	10	CO1	K3
3. Write Short notes on (i) Sag rods (ii) Principal rafter (iii) Roof trusses (iv) Bracing	10	CO1	K2
4. Calculate the design strength of a 20mm diameter bolt of grade 4.6 for the following connections. The main plates to be jointed are 12mm thick (i) Lap joint (ii) Single cover butt joint the cover plate being 10mm thick (iii) Double Cover joint. each of the cover plate being 8mm thick. Assume suitable data.	10	CO2	K3
5. Design a suitable angle section to carry a factored tensile force of 100 kN assuming a single row of M20 bolts. The length of member is 3m.	10	CO2	K3
6. Describe and design a simply supported gantry girder to for the following data: Crane capacity: 160 KN Self-weight of crane girder: 200 KN	10	CO3	K3

Self-weight trolley, electric motor, hooks etc.: 50KN

Min. approach of crane hook to the gantry girder: 1.6 m

Wheel base: 2.8 m

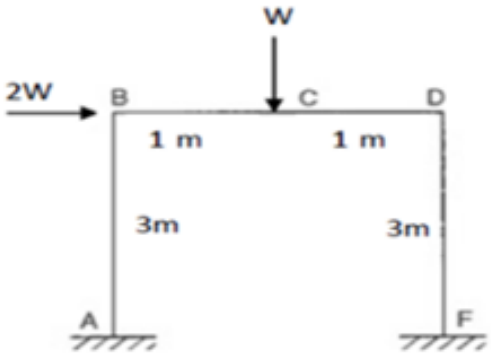
c/c distance between gantry rail: 12 m

c/c distance between column: 6m

Self-weight of rail section: 300 N/m

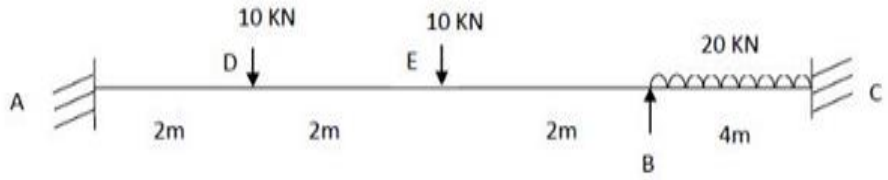
Check the section for maximum bending moment due to vertical forces, lateral forces and longitudinal forces.

7. Determine the collapse load for the frame shown below:



10 CO4 K2

8. A two span continuous beam of uniform section loaded with ultimate loads as shown in Fig. Determine the required plastic moment of resistance.



10 CO4 K2

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