QP Code: RO20MTECH253 Reg. No | | | | | | | | | | | AR 19

GIET UNIVERSITY, GUNUPUR – 765022

M. Tech (Second Semester Examinations) – October' 2021

MPESE2042 – ADVANCED STEEL STRUCTURES

(Structural Engineering)

Time: 2 hrs Maximum: 50 Marks

(The figures in the right hand margin indicate marks)

PART – A

Q.1. Answer ***ALL*** questions (2 x 10 = 20)

a. Classify the column bases provided for steel structures

b. Define the terms Purlin and Louver

c. Differentiate between moment resisting plates and shear resisting plates.

d. Draw the moment rotation curve for different types of connections

e. Describe the advantages and disadvantages of bolted connections.

f. List the categories of imperfections in welding.

g. Classify the types of loads for which an industrial building is to be designed.

h. How is economical spacing of roof trusses obtained?

i. Explain the principle of virtual work

j. What is the collapse load for a simply supported beam with UDL?

PART – B **(6 x 5 = 30 Marks)**

Answer ***ANY FIVE*** questions Marks

2. Examine and design a slab base for a steel column ISMB 350 having width of flange 250 mm and carrying an axial compressive load of 1000 kN If permissible compressive stress in concrete is 4 MPa and permissible bending stress in base plate is 185 MPa. Take bearing capacity of soil as 300 kN/ m^2. (6)

3. Design a 'I' section purlin, for an industrial building situated in the outskirts of Allahabad, to support a galvanized corrugated iron sheet roof for the following data: (6)

   a) Spacing of the truss c/c :6m,

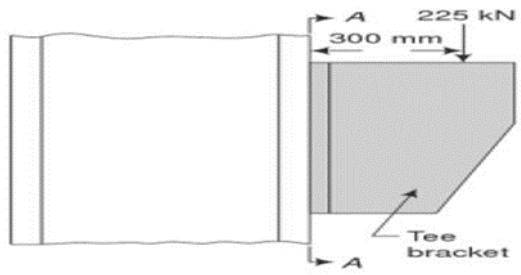
   b) Span of truss :12m,

   c) Spacing of purlins c/c: 1.5m,

   d) Intensity of wind pressure :2kN/m2,

   e) Weight of galvanized sheets :130N/m2, Assume the Grade of steel as Fe 410.

4. Describe and design a bracket connection to transfer an end reaction of 225kN due to factored loads as shown in the fig. The end reaction from the girder acts at an eccentricity of 300mm from the face of the column flange. (6)



5. An ISLB 325 @ 43.1 kg/m transmit an end reaction of 125 kN to the web of ISHB 300@ 63 kg/m. Design the bolted connection. Draw the design details. (6)

6. Describe and design a simply supported gantry girder to for the following data: (6)

   Crane capacity: 160 KN

   Self-weight of crane girder: 200 KN

   Self-weight trolley, electric motor, hooks etc.: 50KN Min.
   approach of crane hook to the gantry girder: 1.6 m

   Wheel base: 2.8 mc/c

   distance between gantry rail: 12 m c/c

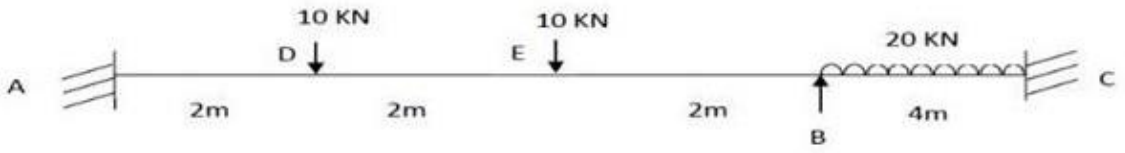
   distance between column: 6m

   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. Explain about Live pan, Pratt and north light trusses roof. (6)

8. A two span continuous beam of uniform section loaded with ultimate loads as shown in Fig. Determine the required plastic moment of resistance (6)



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