JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, August/September - 2021
STRUCTURAL ENGINEERING – II (STEEL)
(Civil Engineering)
Time: 3 Hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
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1.a) Explain the possible limit states that are considered in the limit state method of design of steel structures.
  b) Explain various modes of failure (behavior) of bolted connections with neat sketches.
   [8+7]

2.a) What is prying action? How is it accounted for in the design?
  b) Write the detailed steps for design of the stiffened welded seat connection (subjected to moment due to shear).   [7+8]

3. Design a laced column with two channels back to back of effective length 5.2 m to carry a working axial compressive load of 800 kN.   [15]

4.a) What are lug angles? Explain the design principle of lug angle.
  b) Design a column with effective length 7m. It is subjected to an axial load of 1500 kN. Provide two channel sections placed back to back with lacing. Design suitable lacing system also.   [7+8]

5.a) Write briefly about bending and shearing strength of a laterally supported beam.
  b) Design a laterally supported beam for an effective strength of 5m to carry and U.D.L of 50 kN/m for its entire span. Check for shear and deflection.   [5+10]

6.a) Discuss various methods of plastic analysis of structures.
  b) Determine plastic moment capacity for the continuous beam shown. Plastic moment capacity for each span is mentioned in the figure below.   [5+10]
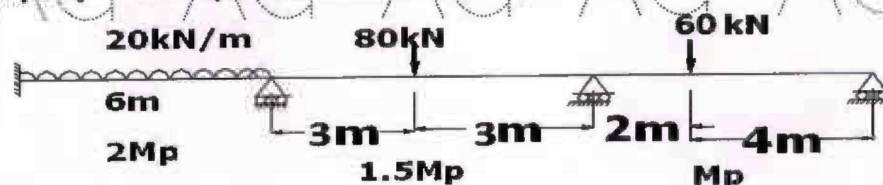
7.a) Write the steps involved in the design of plate girder.
  b) Analyse the expression for the economical depth of the plate girder.   [8+7]

8. Design of gantry girder for an electric overhead crane with the following data:
Capacity of crane= 100 KN. Weight of trolley=40 KN, Weight of crane girder=200KN, Span of crane girder=18m., Centre to Centre distance between columns=8m, Minimum clearance between trolley and gantry girder = 1.2 m centre distance of crane wheels=3m.   [15]

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