KUMARAGURU
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B.E DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Sixth Semester

CIVIL ENGINEERING

U18CET6004: Design of Steel Structures

COURSE OUTCOMES

CO1: Design the bolted and welded joints for steel structures.

CO2: Design steel tension members using plates and angle sections

CO3: Design steel compression members like simple columns, built up columns and angle struts and column bases.

CO4: Design flexural members like beams and plate girders

CO5: Evaluate the various loads acting and design the truss band design the truss members. and purlins.

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	What is bolt value?	CO1	[K1]
2.	List out the various types of welded joints.	CO1	[K1]
3.	What is mean by built up members?	CO2	[K2]
4.	How Angle sections eccentrically loaded through gussets plate ?	CO2	[K2]
5.	What is the use of lug angle?	CO3	[K1]
6.	What is the purpose for providing anchors bolt in base plate?	CO3	[K2]
7.	Where are bearing stiffeners used?	CO4	[K2]
8.	What do you mean by web buckling?	CO4	[K1]
9.	Give general guidelines for fixing spacing of roof trusses.	CO5	[K2]
10.	What are the types of roof trusses?	CO5	[K1]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	Design a single bolted double cover butt joint to connect container plates of thickness 12 mm for maximum efficiency. Use M16 bolts of grade 4.6.boiler plates are of Fe 410 grade. Find the efficiency of the joint.	16	CO1	[K3]

12.	Design a double angle tension member connected on each side of a 10 mm thick gusset plate, to carry an axial factored load of 375 kN. use 20 mm black bolts. Assume shop connection.	16	CO2	[K$_3$]
13.	Design a laced column with two channels back-to-back of length 10 m to carry an axial factored load of 1400 kN.the column may be assumed to have restrained in position but not in direction at both ends.	16	CO3	[K$_3$]
14.	Design a simply supported beam of effective span 1.5 m carrying a factored concentrated load of 360 kN at mid span.	16	CO4	[K$_3$]
15.	Design a welded plate girder of span 30 m to carry on superimposed load of 35 kN/m. avoid use of bearing and intermediate stiffeners. Use Fe 415 steel	16	CO4	[K$_3$]
16.	Symmetric trusses of span 20 m and height 5 m are spaced at 4.5 m centre to centre. Design the channel section purlins to be placed at suitable distances to resist the following loads: Weight of sheeting including bolts=171 kN/m^2 Live load=0.4 kN/m^2 Wind load=1.2 kN/m^2 Spacing of purlins=1.4 m	16	CO5	[K$_3$]

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