Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Sixth Semester

Civil Engineering

CE3601 - Design of Steel Structural Elements

(IS 800 -2007 and Stell tables are Permitted)

Regulations - 2021

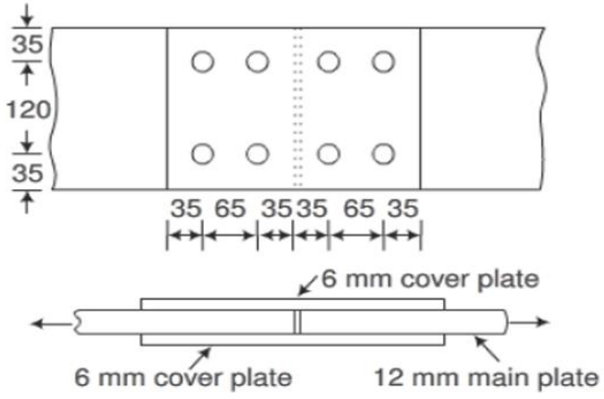
Duration : 3 Hrs ***Maximum : 100 Marks***

PART – A (ANSWER ALL QUESTIONS) (Marks 10×2=20)

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	List out the combinations of loads to be considered in the design.	L3	1	2
2.	Arrange the double cover double bolted lap joint with neat sketch.	L2	1	2
3.	How the tension members are selected?	L2	2	2
4.	What is lug angle?	L2	2	2
5.	Define built up beam.	L1	3	2
6.	Distinguish between web buckling and web crippling.	L3	3	2
7.	What is the purpose of purlin in a roof truss.	L1	4	2
8.	List the various loads to be considered in the design of gantry girders.	L3	4	2
9.	State any two assumptions in Platic analysis.	L3	5	2
10.	Define shape factor.	L3	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5×16 = 80)

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Explain the principles of Limit State Method of design.	L4	1	16
		Or			
	b	Find the efficiency of the butt joint, the main plate size is 190 × 12 mm using two cover plates of size 6mm and 4 numbers of bolts on each side. Use M16 bolts of grade 4.6 and Fe410 plates.	L4	1	16



12.	a	Design a tension member consisting of single unequal angle section to carry a tensile load of 340 kN. Assume single row 20 mm bolted connection. The length of member is 2.4 m. Take fu = 410 MPa.	L4	2	16

Or

	b	Design a column rolled steel I section with cover plates to carry a factored axial load of 2000kN. The effective length in both the planes is 5m. Take fy = 250MPa.	L4	2	16
13.	a	Design a simply supported beam of effective span 5 m and carrying a point load of 200 kN/m. Assume the beam is laterally supported.	L4	3	16
		Or			
	b	Design a bearing stiffener for a welded plate girder with the following specifications. Web = 1200mm × 8mm thick, Flanges = 2 Nos. of 400×20mm plate on each side. Support reaction = 360Kn, Width of the support = 300mm.	L4	3	16
14.	a	Design angle purlin for the following data by simplified method: Spacing of trusses = 4 m, Spacing of purlins =1.6 m, Weight of A.C sheets including laps and fixtures = 0.205kN/m^2, Live load = 0.6 kN/m^2, Wind load =1 kN/m^2, Inclination of main rafter of truss = 21.	L4	4	16
		Or			
	b	Calculate the loads at the nodes of a pinned end fink truss with the following data: Span of truss = 16m, Rise of truss = 4 m, Spacing of truss = 4m, Height of column = 10 m, Roofing shall be of GI sheets, Building is located at Chennai, Steel grade = Fe410.	L4	4	16
15.	a	A built up I section has the following dimensions: Flanges 250 mm × 5 mm, Web 300 mm × 3 mm. Calculate the plastic section modulus and plastic moment capacity of the section also find the shape factor.	L5	5	16
		Or			
	b	Determine the plastic moment capacity of the frame loaded as shown in Figure. El is constant.	L5	5	16