

THE KAVERY ENGINEERING COLLEGE*(An Autonomous Institution)***UG / PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026****Sixth Semester****Civil Engineering Department****CE3601 – DESIGN OF STEEL STRUCTURAL ELEMENTS****(IS800:2007 & Steel Table Can be 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.	Draw stress-strain curve for the mild steel.	L1	1	2
2.	Classify the modes of failure in Steel member.	L2	1	2
3.	Give Short notes about Shear Lag in Tension member.	L1	2	2
4.	What is slenderness ratio?	L1	2	2
5.	Distinguish web buckling and web crippling.	L2	3	2
6.	What do you mean by laterally supported beam?	L2	3	2
7.	Name the loads to be considered for the design of gantry girder.	L1	4	2
8.	List the criteria to be adopted for arriving at the spacing of truss?	L2	4	2
9.	Differentiate Shape Factor and load Factor.	L2	5	2
10.	How do you determine the number of plastic hinges required for collapse?	L2	5	2

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

Q.No	Questions	BLT	CO	Marks
11. a	Two plates 200×8mm of grade Fe410 are connected by 20mm diameter bolts of grade 4.6 using butt joint. Design the bolted connection to transmit the pull of equal strength of the plate. Also sketch arrangement of bolt in a joint.	L4	1	16
	Or			
b	A tie member of a roof truss consists of 2 ISA 90 mm X 60 mm X 10 mm. The angles are connected on either side of 12 mm gusset plate and the member is subjected to a pull of 400kN. Design the welded connection.	L4	1	16
12. a	A tension member of a roof truss carries a factored axial tension of 430kN. Design the tension member using an angle.	L4	2	16
	Or			
b	Design a steel column to carry a factored axial load of 1500kN. The effective Length of the column is 4.2m. Use two channels placed back to back.	L4	2	16
13. a	Design a simply supported beam of 5m span carries a UDL of 40KN/m. In addition the beam carries a central point load of 50 KN. The beam is laterally supported. Design the section.	L4	3	16

Or

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| b | Design a welded plate girder of span 24m to carry superimposed load of 35 kN/m. Avoid use of bearing and intermediate Stiffeners. | L4 | 3 | 16 |
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| 14. a | Calculate the dead load, live load and wind load on a 'Fink' type truss for the following data and mark the loads on the nodes of the truss. Span = 12m, Pitch = $\frac{1}{4}$ of span, Height at eaves level = 10m from the ground, Spacing of truss = 5m c/c. | L4 | 4 | 16 |
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- Or**
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| b | Design a channel purlin for a roof truss having the following data: Span of the truss = 6.0m ,Spacing of truss = 3m c/c, Inclination of roof = 30° Spacing of Purlin = 2m c/c Wind pressure = 1.5 kN/ m ² ,Roof coverage= A.C Sheeting weighing 200 N/m ² , Provide a channel section Purlin. | L4 | 4 | 16 |
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| 15. a | i Evaluate the shape factor for circular section of Diameter D. | L5 | 5 | 8 |
| | ii Evaluate the shape factor for triangular section with its base horizontal. | L5 | 5 | 8 |
- Or**
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| b | Determine the plastic moment capacity of the continuous beam as shown in figure. | L5 | 5 | 16 |
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