



Regulation R18

Subject code: 2P6AC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Supplementary Examinations, February 2024

Design of Steel Structures
(Civil Engineering)

Maximum Marks: 70

Date:20.02.2024 Duration: 3 hours

- Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Note: IS 800:2007 STEEL CODE BOOK AND TABLE BOOK IS ALLOWED

Part-A

All the following questions carry equal marks (10x2M=20 Marks)		CO	Bloom Tx
1	What are the various types of rolled structural steel sections?	CO1	L1
2	List the various types of welded joints.	CO1	L2
3	Classify the modes of failure in Tension members.	CO2	L2
4	State four standard support conditions of compression members and corresponding expressions for effective length.	CO2	L1
5	Define plastic moment?	CO3	L2
6	What is Lateral Torsional Buckling?	CO3	L1
7	Define end bearing in roof trusses	CO4	L2
8	Write the uses of Sag rod in a roof truss?	CO4	L1
9	What is the maximum spacing of vertical stiffener in plate girder?	CO5	L1
10	Differentiate between intermediate stiffeners and bearing stiffeners?	CO5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)			
11	a) Write the Advantages and Disadvantages of welded connections. (5M) b) Briefly explain the various stability checks considered by the IS code. (5M)	CO1	L3 L3
OR			
12	Design a lap joint between the two plates each of width 120mm, if the thickness of one plate is 16mm and the other is 12mm. The joint has to transfer a design load of 160 KN. The plates are of Fe410 grade. Use bearing type bolts. (10M)	CO1	L3
13	Design a bridge truss diagonal subjected to a factored tensile load of 300 kN. The length of the diagonal is 3.0m. The tension member is connected to a gusset plate of 16mm thick with one line of 20mm diameter bolts of grade 8.8. (10M)	CO2	L3
OR			
14	Design a Stanchion 3.5m long, in a building, subjected to a factored load of 550 kN. Both the ends of the stanchion are effectively restrained in direction and position. Use steel of grade Fe410. (10M)	CO2	L3

15	A simply supported steel joist of 4.0m effective span is laterally supported throughout. It carries a total uniformly distributed load of 40 kN (inclusive of self-weight). Design an appropriate section using steel of grade Fe410. (10M)	CO3	L2
	OR		
16	Design a stiffened seated connection for an ISMB 350 @ 514N/m with the column section ISHB 300 @ 576.8N/m. the beam transmits an end reaction of 320kN due to factored loads. The steel is of grade of Fe410. (10M)	CO3	L3
17	Design a channel section purlin for a trussed roof for the following data: (10M) Span of roof = 20 m. Height of truss = 5 m. Spacing of trusses = 4.5 m. Weight of sheeting including bolts = 171 N/m ² Live load = 0.4 KN/m ² Wind load = 1.2 KN/m ² , suction Spacing of purlins = 1.4 m.	CO4	L3
	OR		
18	A power plant structure having maximum dimensions more than 60m is proposed to be built on downhill side near Dehradun. The height of the hill is 400m with a slope of 1 in 3. If the location is 250m from the crest of the hill on the downward slope, and its eve board is at a height of 9m, determine the design wind pressure. (10M)	CO4	L3
19	Design a welded simply supported plate girder for a span of 30m. The girder is loaded with uniformly distributed load of the intensity 35kN/m due to dead and live loads. (10M)	CO5	L3
	OR		
20	A welded plate girder has the following elements; Flange plates – 400 mm × 16 mm one plate for each flange, Web – 2000 mm × 10 mm; determine the sectional properties and moment of resistance of the plate girder. (10M)	CO5	L2