

BE Semester-VIII (Civil Engineering) Question Bank

(Design of Steel Structures)

1.	Draw a neat sketch of plate girder giving elements and state function of each element.	10
2.	What are the various types of stiffeners and state minimum web thickness provisions as per IS 800-2007.	10
3.	Explain simple post critical method of determining shear buckling strength of web.	10
4.	Explain tension field method of determining shear buckling strength of web.	10
5.	List major component of an industrial building with figure.	10
6.	Explain design steps of Gantry Girder.	10
7.	Define shape factor and find it for rectangular section.	10
8.	State the assumption made in plastic design to simplify computation.	10
9.	State the following theorems of plastic collapse : a) static theorem, b) kinematic theorem.	10
10.	Find out collapse load of the simply supported beam having span 5 m and point load 15 kN/m.	10
11.	Find out collapse load of the fixed beam having span 5 m and point load 15 kN/m.	10
12.	Find shape factor for circular and triangular section.	10
13.	Find out D.L.,L.L and WL on the roof truss of an industrial building having span of 15 m provided of spacing of 3.6 m c/c which is required to construct in Bangalore. Consider A.C sheets as a roof covering. Eaves height is 8 m above ground level. Also design the purlin.	40
14.	Find out D.L.,L.L and WL on the roof truss of an industrial building having span of 18 m provided of spacing of 3.2 m c/c which is required to construct in Delhi. Consider G.I sheets as a roof covering. Eaves height is 8 m above ground level. Also design the purlin.	40
15.	Fix suitable configuration of truss for the following data and calculate nodal forces due to DL,LL and WL Span= 28 m, Pitch of truss = 1/4, Location-Ahmedabad Also design main rafter and tie member.	40
16.	Design a welded plate girder for an effective span of 30 m and carrying a uniformly distributed load of 25 kN/m with two concentrated loads 150 kN each at 10 m from either ends. Assume that the top compression flange is restrained laterally. Use Fe415 grade steel. Design as an unstiffened plate girder with thick web.	40
17.	Design a welded plate girder for an effective span of 30 m and carrying a uniformly distributed load of 25 kN/m with two concentrated loads 150 kN each at 10 m from either ends. Assume that the top compression flange is restrained laterally. Use Fe415 grade steel. Design the cross section of plate girder only and check shear buckling strength of web using simple post critical method.	40
18.	A gantry girder of 6.2m span is to be designed for crane capacity of 250kN. The effective span of crane girder is 18m. Weight of crane girder excluding crab is	40

	135kN and weight of crab is 65kN. Take clearance as 1m and wheel base as 3.0m. Choose suitable section and check the bending stresses and deflection	
19.	Design a gantry girder for an industrial building to carry an electrical overhead travelling crane having following data. Crane capacity-250 kN, Weight of crane excluding trolley-200 kN, Weight of trolley(crab)-60 kN, Span of crane girder-20 m, Span of gantry girder-7 m, Wheel base-3.4 m, Weight of rail section-0.25 kN/m, Minimum hook approach-1.1 m, $f_y=250 \text{ N/mm}^2$	40
20.	A foot over bridge is of span 20m and pedestrian load of 4kN/m ² . The clear distance between two trusses is 3.0m and truss height is 2.0m. Take dead weight of truss is 1.10kN/m. Assume suitable configuration of truss and design & detail a cross beam and a top chord near centre.	40