

Th2 Structural Design-II

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What do you mean by bearing type bolt ?
 - b. What is limit state of collapse?
 - c. Differentiate between web buckling and web crippling .
 - d. Define edge distance and end distance.
 - e. Define load bearing and non-load bearing walls.
 - f. Calculate the diameter of bolt hole for M14,M24,M27 bolt.
 - g. Define slenderness ratio and radius of gyration.
 - h. Define butt weld and fillet weld.
 - i. Write the full form of HFS and ERW.
 - j. What do you mean by staggered pitch ?
2. Answer **Any Six** Questions. 5 x 6
 - a. Explain block shear failure.
 - b. What is round tubular section also write their advantages.
 - c. Explain the different types of beam sections used in design according to slenderness ratio .
 - d. A steel tubular column of 4.8 m length is hinged at both ends,it has nominal diameter of 225 mm and is confirm to YST 32 grade . Determine safe load carrying capacity of the column.
 - e. Calculate the net area of a plate section having width of plate as 180mm and connected by a bolt of 20 mm diameter and thickness of plate is given as 15mm.
 - f. Calculate shearing strength and bearing strength of 10.9 class M30 HSFG bolt,connect with 10mm thick plate.
 - g. Write about load bearing type and non load bearing type masonry walls.
3. Answer **Any Three** Questions.
A tension member consists of a flat 100mm X 75mm X 8 mm is connected to a gusset plate of 10mm thick with 3 bolts in a line of M20 bolts at a pitch of 60mm for tension member. Determine the block shear strength. If steel grade Fe410 and bearing bolts of property class 4.6 are used . Take gauge 40mm and edge distance 40mm. 10
4. Determine the design axial load capacity of the column ISHB 300@577 N/m if the length of column is 3m and its both ends pinned. 10
5. Describe factors affecting the strength of a tubular section. 10
6. Design a suitable fillet weld to connect a tie bar 60mm X 8mm to a 12mm thick gusset plate so as to develop maximum force if 5+5
 - (i)Shop welding is done on two sides
 - (ii)Field welding is done on three sides.Assume all necessary data.
7. Design a simply supported beam of effective span of 1.5 m carrying a factored load of 360 KN at mid span. Assume all necessary data. 10