

GUJARAT TECHNOLOGICAL UNIVERSITY**Diploma Semester –Vth Examination December - 2010****Subject code: 355501****Subject Name: Fabrication Design****Date: 24 /12 /2010****Time: 02.30 pm – 05.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) State the General Design procedure with schematic diagram. **07**
(b) Describe the selection criteria for engineering materials. **07**

- Q.2** (a) Define the term “Factor of Safety”. Explain the selection criteria for ‘Factor of safety’ **07**
(b) Explain different design codes for process equipment design. **07**

OR

- (b) Calculate C.G. of the I - section shown in **Fig. - 1** **07**
- Q.3** (a) Define the terms load, stress and strain. Explain the various types of stresses and strain. **07**
(b) A mild steel rod supports a tensile load of 70 KN. If the stress in the rod is limited to 120 N / mm², find the size of rod when the cross – section is 1. **07**
Circular 2. Square 3. Rectangular with width = 3 x thickness.

OR

- Q.3** (a) Explain stress strain diagram with neat sketch **07**
(b) A mild steel rod of 25 mm diameter was tested for Tensile test with a gauge length of 70 mm. Following observation were recorded : **07**
Final length = 80 mm ; Final diameter = 22 mm ;
Yield Load = 80 KN ; Ultimate Load = 110 KN
Calculate : (1) Yield Stress (2) Ultimate Tensile Stress
(3) % Elongation (4) % Reduction in area

- Q.4** (a) Explain different types of heads of pressure vessel with neat sketch. **07**
(b) A double riveted double cover butt joint in plates 20 mm thickness is made with 25 mm diameter rivets at 100 mm pitch. The permissible stresses are **07**
 $F_t = 120 \text{ N/mm}^2$; $F_s = 100 \text{ N/mm}^2$; $F_c = 150 \text{ N/mm}^2$
Find the efficiency of the joint, taking the strength of the rivet in double shear as twice than that of single shear.

OR

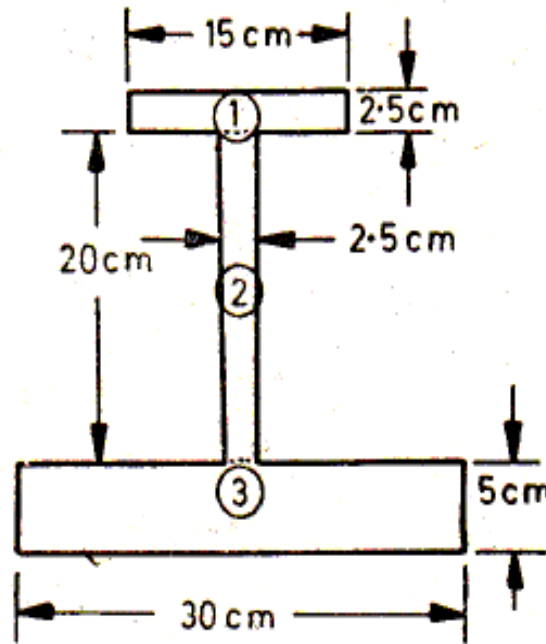
- Q. 4** (a) Explain advantages and disadvantages of welded joints over riveted joints **07**
(b) A plate of 80 mm wide and 10 mm thick is to be welded to another plate by means of parallel fillet welds. The plates are subjected to a load of 60 KN. Find the length of the weld so that the maximum stress does not exceed 70 N/mm² . **07**
Consider the joint first under static loading and then under fatigue loading.
Assume stress concentration factor = 2.7

Q.5

- (a) Explain basic design considerations for structure **07**
(b) A cantilever 1.5 m long is loaded with a uniformly distributed load of 2 kN/m run over a length of 1.25 m from the free end. It also carries a point load of 3 kN at a distance of 0.25 m from the free end. Draw S.F. and B.M. diagrams of the cantilever. **07**

OR

- Q.5** (a) Draw structural design sketch of Industrial shade and Transmission tower **07**
(b) A simply supported beam 4 m long is subjected to two point loads of 2 kN and 4 kN each at distances of 1.5 m and 3 m from the left end. Draw S.F. and B.M. diagrams for the beam. **07**



ALL DIMENSIONS ARE IN CMS
QUE – 2 (b) FIG – 1