

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**DIPLOMA ENGINEERING - SEMESTER-V • EXAMINATION – WINTER 2013**

**Subject Code: 355501****Date: 27-11-2013****Subject Name: Fabrication Design****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.
4. English version is considered to be Authentic.

- Q.1** (a) Explain the factor affecting selection of material. **07**  
(b) Explain the types of protective coatings. **07**
- Q.2** (a) Define the term “factor of safety”? List the important factors that influence the factor of safety. **07**  
(b) Write short notes on : **07**  
(a) resilience  
(b) proof resilience  
(c) modulus resilience
- OR
- (b) A mild steel rod supports a tensile load of 50 kN. IF the stress in the rod is limited to  $100\text{N/mm}^2$ , Find the size of the rod when the cross-section is  
1) Circular 2) Square 3) Rectangular with width = 3 x thk. **07**
- Q.3** (a) Explain failure of riveted joint with neat sketch. **07**  
(b) A plate 100 mm wide and 10 mm thick is to be welded to another plate by means of double parallel fillets. The plate are subjected to static load of 80 KN find the length of weld if the permissible shear stress in the weld does not exceed  $55\text{ N/mm}^2$ . **07**
- OR
- Q.3** (a) Explain strength of transverse fillet & parallel fillet welded joint with neat sketch. **07**  
(b) A double riveted double cover butt joint in plates 20 mm thick is made with 25mm diameter rivets at 100 mm pitch  
 $f_t=120\text{N/mm}^2$ ;  $f_s= 100\text{ N/mm}^2$ ;  $f_c= 200\text{N/mm}^2$   
Find efficiency of the joint taking the stress the riveting double shear as twice than that of single shear. **07**
- Q.4** (a) Explain the classification of pressure vessels as per codes. **07**  
(b) A mild steel rod a 12mm dia. Was tested for tensile strength with the gauge length of 60mm following observation where recorded: **07**  
DATA:  
Final length = 80mm, Final dia. = 7mm, Yield load = 3.4t,  
Ultimate load = 6.1t  
CALCULATE: Yield stress, Ultimate tensile stress, Percentage reduction in area, Percentage elongation
- OR
- Q.4** (a) Explain following terms w.r.t. pressure vessel design briefly **07**  
1. Max. working pressure

2. Internal design pressure
3. External design pressure
4. Design temperature
5. Design stress
6. Corrosion allowance
7. Weld joint efficiency factor

- (b) What is the minimum required thickness of cylindrical shell with the following parameter:-

**07**

1. Material SA 516 GR- 70
2. Inside dia = 3000mm
3. Corrosion allowance = 6 mm
4. Weld joint type 1, 100% RT
5. Design pressure = 2.25 mpa
6. Design temperature = 350<sup>0</sup> C
7. Stress allowable from ASME section II =128mpa

- Q.5** (a) Compare ASME Sec.-VIII DIV-1 & DIV-2

**07**

- (b) Explain in details the various types of loads act on a structure.

**07**

OR

- Q.5** (a) Explain the basic steps in structural design like industrial shade.

**07**

- (b) A cantilever beam 1.5M long is carrying point load of 10 KN each at distances of 0.5M, 1M, and 1.5M from the fixed end. Draw the shear force and bending moment diagram from the cantilever beam.

**07**

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