

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING – SEMESTER –V • EXAMINATION – WINTER-2016

Subject Code: 3355501

Date: 18/11/2016

Subject Name: Fabrication Design

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Each question carry equal marks (14 marks)

- Q.1 (a) Explain the general design procedure and computer aided design procedure. 07
(b) Define the term load, stress and strain. Explain various types of stresses and strain with neat sketch. 07
- Q.2 (a) What do you mean by factor of safety? Explain the selection criteria for 'factor of safety'. 07
(b) A mild steel rod a 15 mm dia. was tested for tensile strength with the gauge length of 80 mm following observation where recorded: 07
DATA:
Final length = 100mm, Final dia. = 12 mm, Yield load = 4 KN,
Ultimate load = 6.8KN
CALCULATE: Yield stress, Ultimate tensile stress, Percentage reduction in area, Percentage elongation
OR
(b) A hydraulic press exerts a total load of 5 MN. This load is carried by 2 steel rods, supporting the upper head of the press. If the safe stress 80 N/mm² & E=210 kn/mm². Find :1) Dia. Of the rods & 2) Extension in each rod in a length of 2.5 m. 07
- Q.3 (a) Explain strength of parallel fillet weld with neat sketch. 07
(b) A double riveted double cover butt joint in plates 12 mm thick is made with 15mm diameter rivets at 80 mm pitch 07
ft=120N/mm²; fs= 100 N/mm²; fc= 200N/mm²
Find efficiency of the joint taking the stress the riveting double shear as twice than that of single shear.
OR
- Q.3 (a) Which is the material used of rivets? Explain essential qualities of a rivet material. 07
(b) A plate 100mm wide 12.5 mm thick is to be welded to another plate by means of parallel fillet weld. The plates are subjected are to load of 50KN. Find the length of the weld so the maximum stress does not exceed 55N/mm².consider the joint first under static loading and then under fatigue loading. 07
- Q.4 (a) Explain design formula (for calculating thickness) with neat sketches various types of 'Head' and 'Closers' used in pressure vessels as per ASME Sec.- VIII Div.-1. 07
(b) A shaft is transmitting 100KW at 160RPM find a suitable dia. For the shaft, 07

If the maximum torque transmitted exceeds the mean by 25% take maximum allowable shear stress as 70 N/mm².

OR

- Q. 4 (a) Compare ASME Sec.-VIII DIV-1 & DIV-2 07
(b) A cantilever beam 1.5M long is carrying point load of 1000Kg 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
- Q.5 (a) Explain the basic design consideration for structural design. 07
(b) What is the minimum required thickness of a cylindrical shell with the following parameters? 07
1. Inside diameter = 3200 mm
 2. Corrosion allowance = 6 mm
 3. Weld joints = Type 1, 100% RT
 4. Design pressure = 3 MPa
 5. Material = SA-516, GR 60;
 6. Strength as per ASME SEC II A = 122 MPa
 7. Design Temperature = 100 °C
- OR
- Q.5 (a) Explain design consideration of transmission tower 07
(b) Explain SF & BM diagram with neat sketch for cantilever beam with a uniformly distributed load 07
