

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING – SEMESTER – VIII • EXAMINATION – SUMMER 2016

Subject Code: 3385502

Date: 13/05/2016

Subject Name: Process Equipment Design

Time: 10:30 AM to 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

- Q.1 (a) Write syntax of 14 different AutoCAD commands used to prepare drawing shown in Fig.-1 07
- (b) Calculate minimum thickness required for seamless ellipsoidal head as per UG 32 of ASME Sec VIII Div 1 from following data : 07
1. Internal Diameter = 4000 mm
 2. Height = 900 mm
 3. Design pressure = 1.38 MPa
 4. Strength as per ASME SEC II A = 95 MPa
 5. Weld joints efficiency = Type 1, 100% RT
 6. Corrosion allowance = 6 mm

Values for Factor K

D/2h	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0
K	1.83	1.73	1.64	1.55	1.46	1.37	1.29	1.21	1.14	1.07	1.0
D/2h	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	
K	0.93	0.87	0.81	0.76	0.71	0.66	0.61	0.57	0.53	0.5	

- Q.2 (a) Explain different categories and types of process equipment failure 07
- (b) Explain selection criteria of Material for Pressure Vessel and Justify your selection. 07

OR

- (b) Define Corrosion and explain Types of Corrosion observed in Process Equipment. 07

- Q.3 (a) A line shaft rotating at 220 r.p.m. is to transmit 18 kW. The shaft may be assumed to be made of mild steel with an allowable shear stress of 42 MPa. Determine the diameter of the shaft, neglecting the bending moment on the shaft. 07
- (b) Write Brief note of mechanical seal. 07

OR

- Q.3 (a) Explain different types of coil used in reaction vessel with neat sketch. 07
- (b) Explain bushed pin flexible coupling briefly with neat sketch. 07

- Q.4 (a) Write Brief note on cladded material for process equipment. 07
 (b) Explain design consideration of shell and tube type heat exchanger. 07

OR

- Q.4 (a) Write brief note on TEMA. 07
 (b) List different types of evaporators. Explain long tube vertical evaporator with neat sketch. 07

- Q.5 (a) Explain the design consideration of crystallizer with neat sketch. 07
 (b) Explain design consideration of evaporators with neat sketch. 07

OR

- Q.5 (a) Explain different methods for wind design of vertical tall tower/column 07
 (b) List different types of hazards in process industry. 07

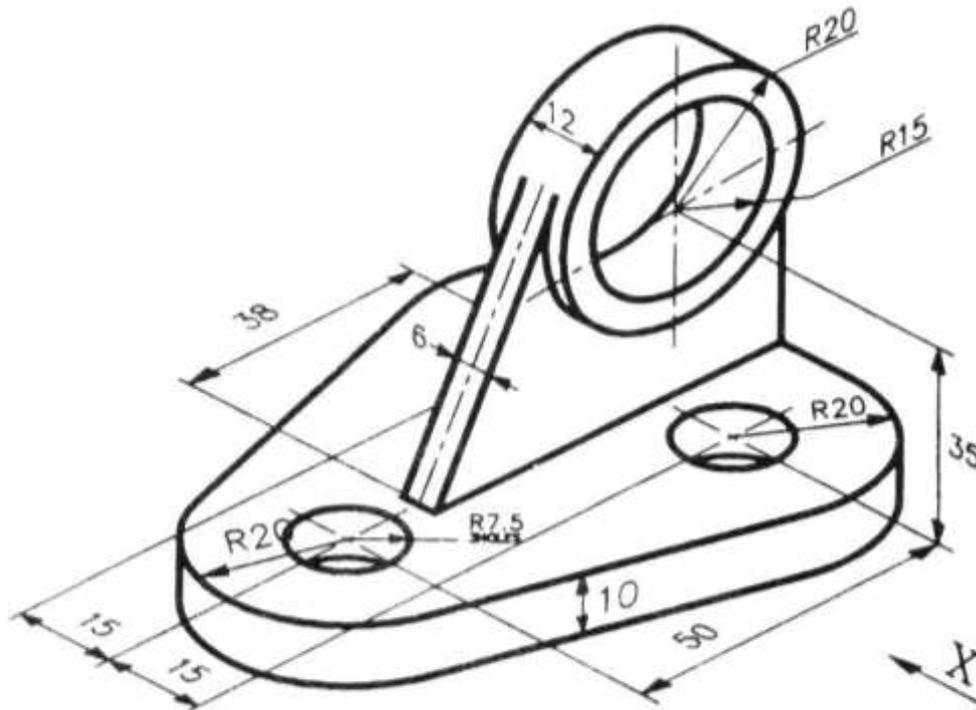


FIG-1 ALL DIMENSIONS ARE IN MM