

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Examination June- 2010

Subject code: 141403

Subject Name: Materials & Manufacture of Food Equipment

Date: 18 / 06 /2010

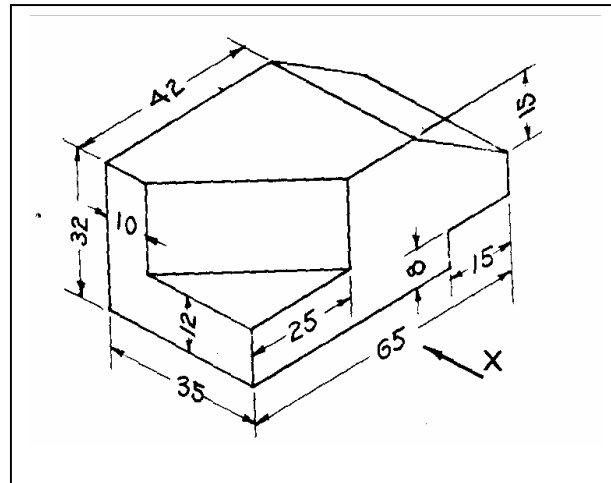
Time: 10.30 am – 01.00 pm

Total Marks: 70

Instructions:

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

- Q.1 (a)** Using first angle projection method draw (i) Front View (ii) Right hand side view **07**
& (iii) Top view of the given pictorial view.



- (b)** Fill in the blanks **04**

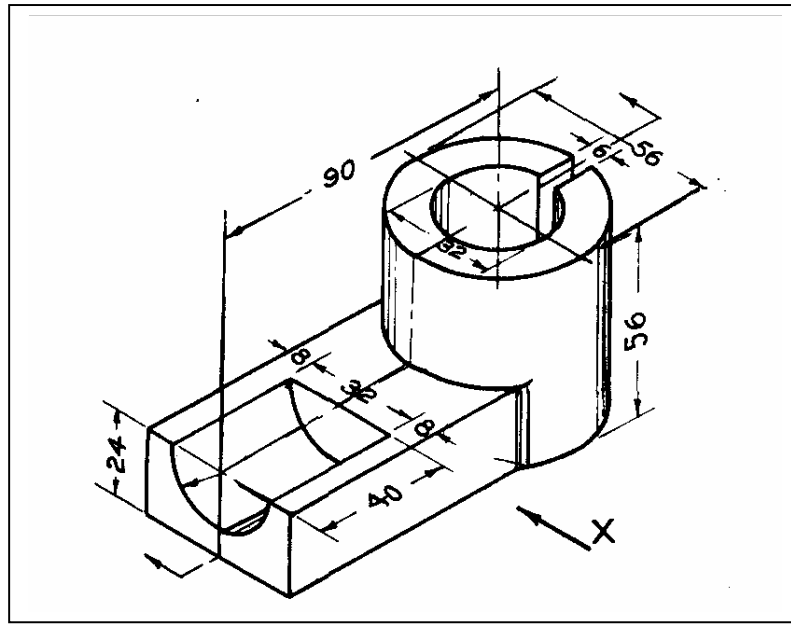
- (1) A Screw thread is formed by cutting a _____ groove on a cylindrical surface.
- (2) In a small size hole the thread is cut by a tool called _____.
- (3) Large size threads are cut on a machine called _____.
- (4) _____ thread is used in the lead screw of lathe.

- (c)** Draw square thread and mention use of it. **03**

- Q.2 (a)** (I) Fill in the blanks **07**

- (1) Creep is expressed in terms of _____
 - (2) _____ absorb energy elastically.
 - (3) Unit of stress in MKS system is _____
 - (4) Failure of material due to repeated stress is known as _____
- (II) What is hardenability? Explain with diagram variation of hardness with depth.

- (b) Using first angle projection method draw (i) Sectional first view (ii) Side view from left (iii) Top view of the given pictorial view. **07**



OR

- (b) Explain the equilibrium diagram with a neat sketch for two metals completely soluble in liquid state and partially soluble in solid state. Describe quenching and write down the criteria for selection of quenching medium. **07**
- Q.3** (a) Define the following term used in connection with screw thread: Core diameter; Outside diameter; Crest; Flank; Depth; Pitch. Show each on a sketch of the threaded end of a screw. **06**
- (b) Draw three views of a hexagonal headed bolt 24 mm diameter and 100 mm long with a hexagonal nut and a washer. **05**
- (c) Draw Buttress thread and write use of it. **03**

OR

- Q.3** (a) Write advantages of vulcanization of rubber and give applications of rubber. **07**
- (b) What is composite material? Write short note on reinforced composite. **04**
- (c) What are geometric tolerances? Mention different types of geometric tolerances. **03**
- Q.4** (a) Metal 'A' melts at 650°C and 'B' melts at 450°C . When alloyed together A and B do not form any compound or intermediate phase. The solid solubility of metal A in B and B in A are negligible. The metal pair forms an eutectic at 40% A and 60% B which solidifies at 300°C . Assume the liquidus lines to be straight. Draw the phase diagram for the alloy series and find out (a) The temperature at which the alloy 70% A and 30% B starts complete solidification. (b) For the same alloy the amount of solid phase and liquid phase at 400°C . **07**

- (b) Define the followings; 04
- (1) Eutectic system
 - (2) Peritectic system
 - (3) Eutectoid system
 - (4) Peritectoid system
- (c) Why tempering is required? List out the classification of tempering. Explain any two tempering process. 03

OR

- Q.4** (a) Explain the importance of TTT diagram and write down the various steps to construct a TTT diagram. 06
- (b) Two steel sheets of 1.0mm thick are spot welded in a lap joint with a current of 30,000A for 0.005 second. The effective resistance of the joint can be taken as 100 micro ohms. The joint can be considered as a cylinder of 5mm dia and 1.5mm height. Density of steel is 0.00786 g/mm^3 and heat required for melting taken as 10 J/mm^3 . Calculate the heat lost to the surrounding. 05
- (c) Define Basicity Index (BI). Write down the selection of electrode diameter with respect to the metal thickness. 03

- Q.5** (a) Differentiate between 06
- (1) Fused flux and Agglomerated flux
 - (2) Touch & Draw and Drag method
 - (3) Consumable and Non consumable electrode
- (b) List out important points to be kept in mind during welding and explain different welding defects. 05
- (c) List out different welding process. Define Maximum rated open circuit, Rated current and Duty cycle. 03

OR

- Q.5** (a) Give the short notes on 06
- (1) Friction welding
 - (2) Submerged arc welding
 - (3) Flame characteristics
- (b) Define the followings with neat sketch 04
- (1) Base metal
 - (2) Deposition rate
 - (3) puddle
- (c) What is Plate Heat Exchanger (PHE)? Write down the advantages of PHE. 04
