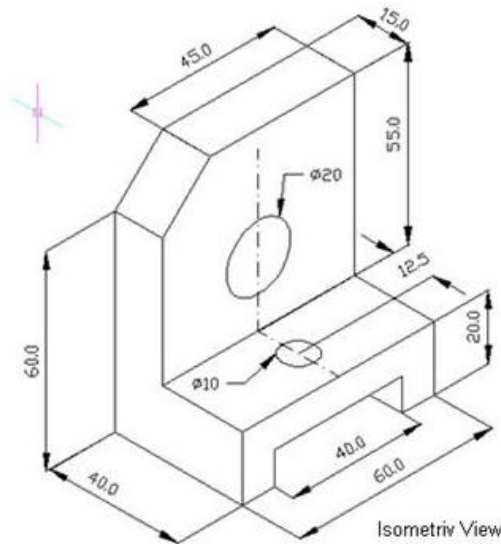


**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 141403****Date: 29-12-2014****Subject Name: Materials and Manufacture of Food Equipment****Time: 02:30 pm - 05:30 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Provide drawing supplementary sheet for Q.1(a)

- Q.1 (a)** Using first angle projection method draw front view, top view and any one side for a given object. **07**



- (b)** Define the followings **07**
1. Ductility
  2. Resilience
  3. Stiffness
  4. Toughness
  5. Brittleness
  6. Fatigue
  7. Hardness

- Q.2 (a)** Explain any three with diagram **07**
- a) Gib head key
  - b) Tolerance of flatness
  - c) Foundation bolts
  - d) Dome nut

- (b)** Discuss the followings **07**
- i) Phase diagram
  - ii) Eutectic system
  - iii) Cementite and Bainite

**OR**

- (b)** What are composite materials? Write in brief about cermets. **07**

- Q.3** (a) What is cooling curve? Explain iron allotropy in detail with diagram. Also discuss micro constituents of iron and steel. **07**
- (b) Explain difference between the first angle projection method and the third angle projection method. Draw Acme thread and write uses of it. **07**
- OR**
- Q.3** (a) Discuss the followings **07**
- (a) Mechanical Properties (b) Proof stress  
(c) Ultimate stress (d) Properties of copper  
(e) Properties of aluminum
- (b) Write short notes on the followings **07**
- a) Socket and spigot joint  
b) Condensation polymerization
- Q.4** (a) Discuss the working principle of Resistance and Friction welding with diagram. **07**
- (b) Describe various mechanisms of polymerization in details. What are the applications of polymers in food processing industries? **07**
- OR**
- Q.4** (a) During the arc welding the voltage and current is 20V and 200A respectively. If the travel speed is 7mm/s, are area is 20 mm<sup>2</sup>, calculate the melting efficiency. Heat required to melt the steel is 10 J/mm<sup>2</sup> and the heat transfer efficiency is 0.85. **07**
- (b) Difference between annealing and tempering. What are the different annealing process in discuss in detail. **07**
- Q.5** (a) Draw neatly any three types of square threads assuming pitch 20 mm. State all dimensions. **07**
- (b) Write down the importance of heat exchanger in food industry. List out different types of heat exchangers. Draw the temperature profile diagram for counter and parallel flow **07**
- OR**
- Q.5** (a) Draw knuckle thread and write uses of it. Define polymers. What is vulcanization of rubber? **07**
- (b) Define the evaporators and its usefulness in food industry. Differentiate between single effect and multiple effect evaporators. Describe different methods of feeding in evaporators. **07**

\*\*\*\*\*