

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. Sem. – IV - Examination –June- 2011

Subject code: 141403

Subject Name: Materials & Manufacture of Food Equipment

Date:08/06/2011

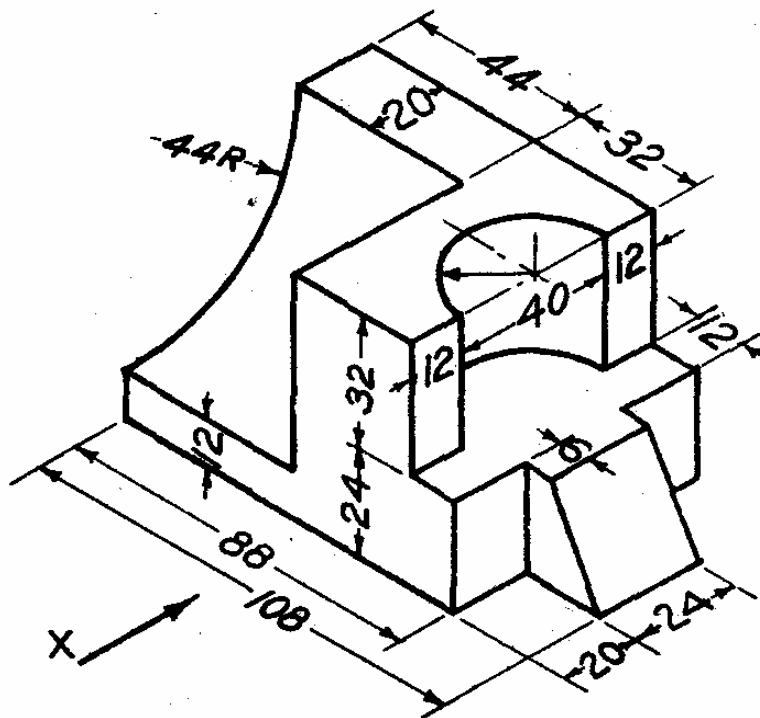
Time: 10.30 am – 01.00 pm

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 in the direction of arrow (ii) Left hand side view & (iii) Top view of a given pictorial view. All the dimensions are in mm. **07**



(b) In the first angle projection method, **03**

- (i) The _____ comes between the _____ & the _____.
- (ii) The _____ view is always the _____ view _____.
- (iii) The left side view is placed to the _____ of the _____ view.

(c) Explain clearly the difference between the first angle projection method and the third angle projection method. 04

Q.2 (a) Sketch neatly, any three types of profile of triangular threads. State the angle of thread in each case and dimension the depth, assuming pitch of 10 mm. **07**

Fill in the blanks.

(b)

- 1) The thread cut on the surface of a rod is called _____ thread, while that cut on the surface of a hole is called _____ thread.
- 2) Knuckle thread is a modified form of _____ thread.
- 3) The square thread is used for _____ transmission. Its flanks make _____ angle with the axis.
- 4) The combination of square and V threads is made in _____ thread which is used in the screw of _____.

	OR	
	(b) Define any four parts of screw threads.	04
	(c) Draw Acme thread and write uses of it.	03
	OR	
	(c) Draw knuckle thread and write uses of it.	03
Q.3	(a) Draw three views of a hexagonal nut for a 24 mm diameter bolt, according to approximately standard dimensions.	06
	(b) Define chamfering. What is washer? Why it is used in between nut and bolt?	03
	(c) Define polymers. What are the applications of polymers in food processing industries?	05
	OR	
Q.3	(a) Describe various mechanisms of polymerization in details.	06
	(b) Define elastomers and rubbers. What is vulcanization of rubber?	03
	(c) Differentiate between thermoplastics and thermosetting plastics.	05
Q.4	(a) Write in brief;	07
	1. Multiple effect evaporator	
	2. Mixed type cross flow	
	3. Joint efficiency	
	4. Cold cracking	
	5. Normalizing	
	6. Cyaniding	
	7. Martensite	
	(b) What do you understand by welding? Give important points to be kept in mind during welding. Also discuss different welding defects.	07
	OR	
Q.4	(a) Metal A melts at 650 ⁰ C and B melts at 450 ⁰ 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 eutectic at 40% A and 60% B, which solidifies at 300 ⁰ C. Assume the liquidous line to be straight. Draw the phase diagram for the alloy series and find ;	07
	1. The temperature at which the alloy 70%A and 30%B starts complete solidification.	
	2. For the same alloy, the amount of solid phase and liquid phase at 400 ⁰ C.	
	(b) What are the different material properties are needed to fabricate process equipments and also define Proportional limit, Elastic limit, and Ultimate stress.	07
Q.5	(a) Explain the purpose of heat exchanger in food industry. Give the list of different types of heat exchangers. Draw the temperature profile of counter and parallel flow heat exchanger.	07
	(b) Why evaporators are required in food industry? List out different types of evaporators and also discuss the details of each evaporator.	07
	OR	
Q.5	(a) Discuss consumable and non consumable electrodes. Show the specification of electrode diameter with metal thickness. Also discuss physical classification of flux.	07
	(b) Explain the detail principle of resistance welding with its advantages and disadvantages.	07
