Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 141403 **Date: 06/06/2017**

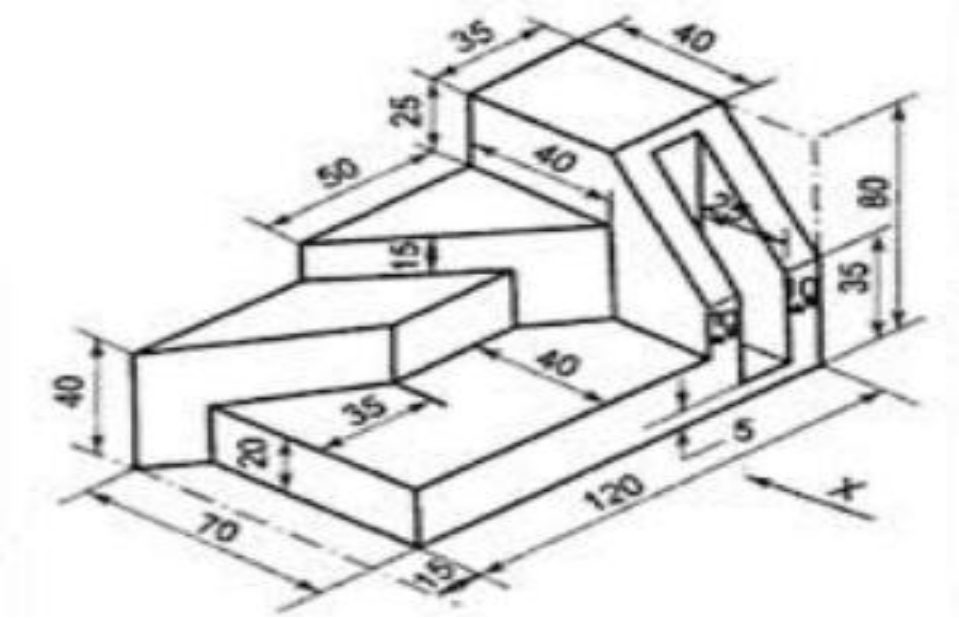
Subject Name: Materials & Manufacture Of Food Equipment

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. ***Provide drawing supplementary sheet for Q.1(a)***

Q.1 **(a)** Draw the (1)front view (2) top view and (3) left hand side view of the given figure using first angle method of projection (All the dimensions are in mm) **14**



Q.2 **(a)** Following data for metal A and B is given below; **07**

1. Melting point of A = 650^0C
2. Melting point of B = 450^0C
3. Formation of eutectic composition at 40% A and 60% B
4. Solidification temperature = 300^0C
5. Maximum solid solubility of B in A at 300^0C= 20%B
6. Maximum solid solubility of A in B at 300^0C= 10%B
7. Assume lines are straight

Draw the phase diagram from above data and calculate

a. Temperature at which alloy 90% A and 10% B starts and completes freezing

b. For same alloy amount of solid phase and liquid phase at 550^0C

(b) Give the difference between ferrous and non ferrous metals. Discuss the property of aluminum and copper. **07**

OR

(b) What are the steps to be followed to draw a hexagonal nut? Explain and draw the hexagonal nut having major diameter 42 and thickness 10. **07**

Q.3 **(a)** Write down the importance of flux in welding. Explain the composition of Fused and Agglomerated flux. **07**

(b) Define the followings in brief. **07**

1. Annealing
2. Fusion zone
3. Oxidizing flame
4. Hot cracking
5. Creep
6. Tempering
7. Tack of weld

OR

Q.3 **(a)** Write a short note on reinforced materials. **07**

(b) Give the reasons of cracking in welding joints. **07**
Calculate the melting efficiency in the case of arc welding of the steel with a potential of 20V and current of 200A, travel speed is 5mm/s and area of arc is $20mm^2$.Heat required to melt the steel is 10 J/mm^2 and the heat transfer efficiency is 0.85.

Q.4 **(a)** 1. What is the symbol of flatness? How the perpendicularity of an object is illustrated? **02+02+03**
2. What are the different types of section lines drawn based on different material of construction?
3. Explain key joints in detail.

(b) Discuss the followings in detail **07**

1. Resistance welding
2. Friction welding

OR

Q.4 **(a)** Describe in brief with diagram about the followings (any two) **07**
1. Metric thread
2. Dome nut
3. removed section

(b) Discuss the purpose of evaporators in food industry. Draw the temperature profile diagram of counter and parallel flow. **07**

Q.5 **(a)** Define the followings **07**
1. Crest
2. Co-polymerization
3. Dimensional tolerance
4. unilateral limit
5. flank
6. Degree polymerization
7. geometrical deviation

(b) Describe the principle of SAW. List out the advantages of gas weding. **07**

OR

Q.5 **(a)** Explain mechanism of polymerization in brief. Give an example of condensation polymerization. **07**

(b) What do you understand by heat treatment process in metals? Explain cooling curve with diagram. **07**

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