

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: BE03023021

Date: 17-12-2025

Subject Name: Thermoset Materials and Processing Techniques

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. Simple and non-programmable scientific calculators are allowed.

Marks

Q.1 (a) Choose the correct answer for the following questions:

03

- i) Which of the following describes the molecular structure of a thermoset plastic after curing?
a) Linear chains b) Branched chains c) Cross-linked network
- ii) The process by which thermoset resins form a rigid three-dimensional network is called _____.
a) Melting b) Curing c) Softening
- iii) What is the common by product of some thermoset curing reactions?
a) Oxygen b) Nitrogen c) Water

(b) State the advantages & disadvantages of compression molding.

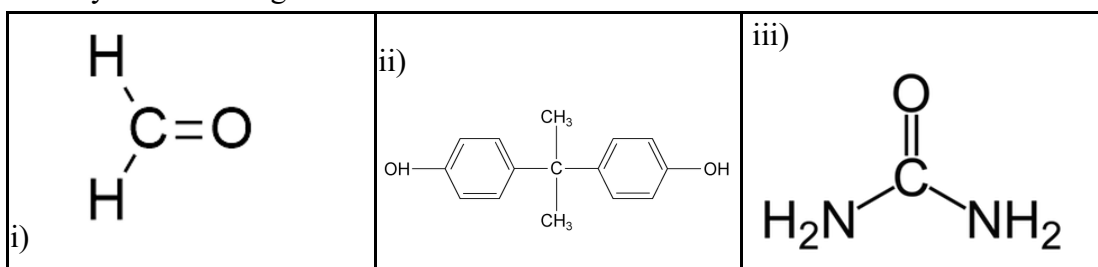
04

(c) Describe Preforms & its advantages in processing of thermosets.

07

Q.2 (a) Identify the following materials.

03



(b) State the applications of Epoxy.

04

(c) Explain the steps in Compression Molding process with necessary sketches

07

OR

(c) Explain the manufacturing process of Phenol Formaldehyde with a neat flow diagram.

07

Q.3 (a) Explain the preparation of the following monomers i) Urea ii) Formaldehyde

03

(b) Differentiate between Resol & Novolac.

04

(c) List the types of compression molds. Explain the semi-positive landed compression mold with a neat diagram.

07

OR

- (a) Define Preheating. Describe its importance in processing of thermoset materials. 03
 - (b) Discuss the preparation of Polyester resin with necessary reactions & list the applications of polyester. 04
 - (c) Explain the Pot type transfer mold with a neat labeled diagram. 07
- Q.4**
- (a) Define Bulk factor & discuss its importance in processing of thermosets. 03
 - (b) Elaborate the importance of Land area & Pressure Pads in compression molding process. 04
 - (c) Explain the preparation & curing mechanism of Urea Formaldehyde with necessary reactions. 07

OR

- (a) State the points of comparison between Compression & Transfer molding. 03
 - (b) Discuss the preparation of Epoxy with necessary reactions. 04
 - (c) Draw & explain the flow diagram showing manufacturing of Melamine formaldehyde & state the applications of Melamine Formaldehyde. 07
- Q.5**
- (a) State the reactions for the preparation of the following monomer i) Melamine ii) Bisphenol - A 03
 - (b) State the applications of Urea Formaldehyde 04
 - (c) Calculate height of powder well for semi-positive landed compression mold for manufacturing carrom board striker having 40mm diameter and thickness 4mm. Bulk factor of material is 6. Consider land length = 5mm. 07

OR

- (a) State the properties & applications of Silicon. 03
- (b) Draw the figure of screw type transfer mold & explain it. 04
- (c) List the causes & remedies for the following problems occurring in compression molding. 07
 - i) Flash ii) Short shot iii) Blisters
