Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–IV(NEW) – EXAMINATION – SUMMER 2019**

**Subject Code:2142301 Date:09/05/2019**

**Subject Name: Basic Plastic Processing and Thermal Engineering**

**Time:02:30 PM TO 05:00 PM Total Marks: 70**

**Instructions:**

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

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | What is Plastic Processing? List various processing methods for thermoplastics and thermosets. | **03** |
| | **(b)** | What are Bulk factor and Preforms? Give Advantages and limitations of Preforms. | **04** |
| | **(c)** | With neat diagram explain Rotational molding process steps. | **07** |
| **Q.2** | **(a)** | Define: Thermoforming. List various thermoforming processes. Give any two applications of thermoforming products. | **03** |
| | **(b)** | Define: Mold, Cavity, Blow ratio, Vent. | **04** |
| | **(c)** | Explain with neat diagram (i) Drape forming (ii) Twin sheet thermoforming. | **07** |
| | | **OR** | |
| | **(c)** | With neat diagram explain Plunger type transfer molding process. | **07** |
| **Q.3** | **(a)** | Give difference between Extrusion Blow molding and Injection Blow molding. | **03** |
| | **(b)** | Which are the factors to be considered for Compression molding? Discuss. | **04** |
| | **(c)** | Give advantages and limitations and applications of Rotational molding. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | The outer surface of a 0.3m thick concrete wall (10 m x 3 m) is kept at a temperature of 10 ºC while the inner surface is kept at 40 ºC. Thermal conductivity of the concrete is 1.2 W/mK. Determine the rate of heat loss through it. | **03** |
| | **(b)** | Give causes and remedies in Blow molding process for following defects: (i) Parison Curl (ii) Rough Parison (ii) Warpage (iv) Variable wall thickness. | **04** |
| | **(c)** | Give principle of Stretch Blow molding and explain Injection blow molding process with neat diagram. | **07** |
| **Q.4** | **(a)** | The outer surface temperature of a roof is 40 ºC and that of the ambient air is 10 ºC. Calculate the rate of heat exchange between ambient air and 250 $m^2$ of outer roof area if the value of convective heat transfer coefficient is 10 W/ $m^2$ K. | **03** |
| | **(b)** | Discuss melt stability and plastic memory properties for material selection criteria in thermoforming. | **04** |
| | **(c)** | What is the role of Heat Exchanger? Discuss various types of Heat exchanger in detail. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | What is the purpose of Preheating? List various method used for the same. | **03** |

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|---|---|---|---|
| | **(b)** | What are the different types of heating system used for heating the rotational mold? Discuss in brief. | **04** |
| | **(c)** | Write a note on: Parison Programming | **07** |
| **Q.5** | **(a)** | Differentiate between Blow molding & Injection molding process. | **03** |
| | **(b)** | What is Pinch off? Explain materials used for preparation of Blow Mold. | **04** |
| | **(c)** | What is conduction? Give heat conduction equation using Fourier's Law. | **07** |

**OR**

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|---|---|---|---|
| **Q.5** | **(a)** | Give advantages and disadvantages of Transfer molding. | **03** |
| | **(b)** | List types of compression molds and explain any one with diagram. | **04** |
| | **(c)** | Explain Plug assist thermoforming process with neat diagram. | **07** |

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