Enrollment No./Seat No.:

# GUJARAT TECHNOLOGICAL UNIVERSITY

**Bachelor of Engineering - SEMESTER - VI EXAMINATION - SUMMER 2025**

**Subject Code: 3163408** **Date: 30-05-2025**

**Subject Name: Plastic Mould and Die design**

**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.**

| | | | Marks |
|---|---|---|---|
| **Q.1** | **(a)** | Define mold and die with examples. | **03** |
| | **(b)** | Differentiate between ferrous and non-ferrous mold materials with examples. | **04** |
| | **(c)** | Explain runner balancing with an example and sketch. | **07** |
| **Q.2** | **(a)** | State the purpose of a cooling channel in an injection mold. | **03** |
| | **(b)** | Demonstrate the sequence of operations in compression moulding using a flowchart. | **04** |
| | **(c)** | Explain with sketch any three types of transfer molds. | **07** |
| | | **OR** | |
| | **(c)** | Describe the step-by-step fabrication process of a Plastic mold. | **07** |
| **Q.3** | **(a)** | Explain function of plunger in transfer mold. | **03** |
| | **(b)** | What are Guide Bush and Guide Pin in injection molding? Explain their functions and importance in mold alignment. | **04** |
| | **(c)** | Explain EDM and spark erosion process used in cavity making. | **07** |
| | | **OR** | |
| | **(a)** | Describe any two types of ejection systems. | **03** |
| | **(b)** | Analyze how melt temperature variations impact extrusion product quality. | **04** |
| | **(c)** | Explain the importance of gate design in mold manufacturing. Discuss the different types of gates used in injection molding. | **07** |
| **Q.4** | **(a)** | Mention one use each of lathe and milling machine in mold making. | **03** |
| | **(b)** | Write short note on CNC machine application in mold making. | **04** |
| | **(c)** | Explain the concept of the mold filling pattern in injection molding. Discuss the factors that affect the mold filling pattern, and explain how these factors influence the quality of the molded product. | **07** |
| | | **OR** | |
| | **(a)** | How does Third Angle Projection help avoid errors in the manufacturing of multi-part mold components? | **03** |

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|---|---|---|---|
| | **(b)** | Illustrate the extrusion process with a neat sketch and label. | **04** |
| | **(c)** | Explain the design considerations for an extrusion die. List and explain any four key factors that influence the design of an extrusion die. | **07** |
| **Q.5** | **(a)** | Predict the result of improper cooling time during injection moulding. | **03** |
| | **(b)** | Explain mold material selection for cavity and core with examples. | **04** |
| | **(c)** | What is a Bill of Materials (BOM) in mold design? List and explain any four important items typically included in the BOM of an injection mold. | **07** |

**OR**

| | | | |
|---|---|---|---|
| | **(a)** | List two types of injection moulding machines and their working basis. | **03** |
| | **(b)** | Explain role and design of guide elements (pins & bushes) in mold design. | **04** |
| | **(c)** | Discuss economic considerations in mold design and material selection. | **07** |

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