

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023**

**Subject Code:2161909**

**Date:07-12-2023**

**Subject Name: Production Technology**

**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.
4. Simple and non-programmable scientific calculators are allowed.

**MARKS**

- Q.1**
- |                                                                                                                                                           |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>(a)</b> Briefly explain six point locating principle in jigs and fixtures with the help of neat sketch.                                                | <b>03</b> |
| <b>(b)</b> With the help of neat sketch explain electro discharge machining process principal. Also state its advantages, disadvantages and applications. | <b>04</b> |
| <b>(c)</b> Draw geometry of single point cutting tool and explain the significance of all angles.                                                         | <b>07</b> |

- Q.2**
- |                                                                                                                 |           |
|-----------------------------------------------------------------------------------------------------------------|-----------|
| <b>(a)</b> Elaborate the term clearance in press operation and explain it's important in shearing operation.    | <b>03</b> |
| <b>(b)</b> Briefly explain rules of locating in jigs and fixtures with neat sketch.                             | <b>04</b> |
| <b>(c)</b> Derive and draw merchant's force diagram. State the assumptions made in development of such diagram. | <b>07</b> |

**OR**

- |                                                                                                                                                                                                                                                                                                                                                                             |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>(c)</b> The cutting force and thrust force in an orthogonal cutting operation are 1470 N and 1589 N, respectively. The rake angle = $5^\circ$ , the width of the cut = 5.0 mm, the chip thickness before the cut = 0.6, and the chip thickness ratio = 0.38. Determine (a) the shear strength of the work material and (b) the coefficient of friction in the operation. | <b>07</b> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
- Q.3**
- |                                                                                                                     |           |
|---------------------------------------------------------------------------------------------------------------------|-----------|
| <b>(a)</b> Explain cam clamping method for clamping blanks in fixture with suitable sketch.                         | <b>03</b> |
| <b>(b)</b> Name and briefly describe various types of chips produced in metal cutting with the help of neat sketch. | <b>04</b> |
| <b>(c)</b> Explain the various methods used for thread manufacturing. Also state its characteristics.               | <b>07</b> |

**OR**

- Q.3**
- |                                                                                                                                     |           |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>(a)</b> With definition of jigs and fixtures explain advantages and difference between them.                                     | <b>03</b> |
| <b>(b)</b> Explain following term related to single point cutting tool geometry. 1. Shank 2. Tool point 3. Cutting edge and 4. Face | <b>04</b> |
| <b>(c)</b> List out different methods of gear manufacturing. Explain Hobbing method in details with its advantages and limitation.  | <b>07</b> |

- Q.4 (a)** Explain the main factors influencing tool life. **03**  
**(b)** What is cutting fluid? Elaborate various properties of cutting fluids. **04**  
**(c)** Enlist various die used in press tool. Explain any one in detail. **07**

**OR**

- Q.4 (a)** Briefly explain the term tool life. **03**  
**(b)** What are the reasons for heat generation during cutting operations? Explain various heat zones in metal cutting. **04**  
**(c)** List and explain the various methods of reducing cutting force requirement in press work. **07**
- Q.5 (a)** Define and classify non conventional machining processes. **03**  
**(b)** Explain any five kind of locators use to locate blanks in fixture with the help of neat sketch. **04**  
**(c)** Schematically explain the principle of ultrasonic machining with advantages and disadvantages of USM **07**

**OR**

- Q.5 (a)** Write short note on electro chemical grinding process. **03**  
**(b)** Explain factors to be consider while designing for clamping in jigs and fixtures. **04**  
**(c)** Explain with neat sketch working principle, capabilities and limitation of abrasive jet machining process. **07**

\*\*\*\*\*