# **GUJARAT TECHNOLOGICAL UNIVERSITY** ME – SEMESTER – II • EXAMINATION – SUMMER 2017

## Subject Code: 2722807 Subject Name: Tool & Die Design Time: 02:30 PM to 05:00 PM Instructions:

Date:29/05/2017

07

## tructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- **3.** Figures to the right indicate full marks.
- Q.1 (a) Define tool & Discuss the role of tool & die designer in metal forming process. 07
  - (b) Discuss the following Design features of Twist Drill.
    (i) Power required for Drilling
    (ii) Number of teeth & flutes
    (iii) Size of twist drill
- Q.2 (a) Distinguish between jigs and fixtures. State advantages and limitations of jigs 07 and fixtures.
  - (b) Explain the design of fixtures for NC/CNC machines & their application for 07 industries.

## OR

- (b) How to design modular fixtures with their best feature and manufacturing 07 methods?
- Q.3 (a) Discuss the various types of pilots used in progressive die. Compare between 07 direct and indirect pilots.
  - (b) What is Material Utilization factor (MUF)? How to calculate Shearing load of **07** Press working?

## OR

- Q.3 (a) Design a die block for blanking an 85 mm diameter circle from a 1 mm thick 07 steel sheet having shear strength of 400 MPa.
  - (b) A circular disc of 25 mm diameter is to be produced from a 1.6 mm thick sheet 07 of C30 steel with allowance shear strength of 350 MPa. Find the die and Punch sizes. How will these sizes changes if a piercing operation of 25 mm diameter was to be carried out instead of the blanking operation?
- Q.4 (a) Explain following i) What are various methods of reducing cutting forces to 07 prevent overloading of press? ii) What are the Advantages of Press Forging over Drop Forging?
  - (b) What is Flash in design of forging dies? How to control of flash?

### OR

- Q.4 (a) Explain the design consideration of cooling system of injection molding. 07
  - (b) Estimate the pressure required to extrude aluminum curtain rail if I- section 12 07 mm high with 6 mm wide flanges, all 1.6 mm thick, from 25 mm diameter bar stock.  $\sigma_0$ = 150 MPa.
- Q.5 (a) How to calculate the mold opening and ejecting force in Injection Molding 07 process?
  - (b) List out the metals used in die casting die design and their significance effect in 07 die casting process.

### OR

Q.5(a) Discuss the various defects in die casting with neat sketch.07(b) Describe the thermal aspects of die casting.07

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