

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:3152309****Date:03/02/2021****Subject Name:Plastic Mold & Die Design****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use Grpah paper for drawing of mould

| | | MARKS |
|------------|--|-----------|
| Q.1 | (a) Define : Mould ; Insert ; Guide pin | 03 |
| | (b) Fill in the blanks: | 04 |
| | 1. Material of Insert is _____ | |
| | 2. Material of Guide pin is _____ | |
| | 3. Function of ejector pin is _____ | |
| | 4. For hollow products , _____ejection is used. | |
| | (c) For the figure shown in fig[a], design a single impression injection mould. Show calculations for feed system in detail. | 07 |
| Q.2 | (a) Draw cooling channels for Integer Core cooling | 03 |
| | (b) Discuss functions of Lathe, Milling, Shaping, Grinding Machines. | 04 |
| | (c) For the mould designed in Q1[c] , draw both plan and sectional elevation of the mould. | 07 |
| Q.3 | (a) Discuss Integer v/s. Insert bolster moulds. | 03 |
| | (b) Discuss integer cavity cooling | 04 |
| | (c) Discuss in detail about Heat Rods | 07 |
| Q.4 | (a) Discuss about Rectangular edge gate and fan gate. | 03 |
| | (b) Show cooling of Shallow Cores | 04 |
| | (c) Discuss helical channel Cooling for deep cores | 07 |
| Q.5 | (a) Discuss about gates that can be used for hollow mouldings. Give advantages and disadvantages. | 03 |
| | (b) Determine the pitch and the pitch circle diameter for the interconnecting groove design , given the following information: Diameter of insert : 30mm ; Gap between inlet and outlet grooves : 4.5mm ; number of impressions : 12 ; depth of groove : 5mm. | 04 |
| | (c) Discuss Stripper plate Ejection in detail | 07 |
| Q.6 | (a) Discuss about Sprue pullers | 03 |
| | (b) Tick the correct one: | 04 |
| | 1. Shaping operation removes metal in [a] cm [b] mm [c] micron [d] meter | |
| | 2. For solid rectangular mouldings , owe use _____gate. [a] Fan [b] Film [c] Tab [d] edge | |
| | 3. Wire EDM is used for [a] cutting complex contours [b] gear cutting [c] | |

making grooves [d] making thin intricate shapes in mould plates

4. For materials with high melt viscosity, runner and gate dimensions are

[a] increased by 20% [b] increased by 25% [c] decreased by 20% [d] decreased by 25%

(c) What are collapsible cores? Discuss

07

Q.7 (a) Design a rectangular edge gate for a PE box whose dimensions are : length = 130 mm ; width = 80mm ; depth = 30mm; wall thickness = 2 mm. take $n = 0.6$

03

(b) Calculate the shot capacity of the injection moulding machine if a product of weight 40 gms is to be moulded in ABS and a 16 impression mould is desired. Assume:

04

Bulk factor of PS = 1.9

Bulk factor of ABS = 1.8

Specific gravity of PS = 1.04

Specific gravity of ABS = 1.0

(c) Discuss Pin Ejection

07

Q.8 (a) Discuss requirements of gates

03

(b) Discuss actuating methods of Stripper plates.

04

(c) Calculate runner efficiency for Fully Round, Half Round, Trapezoidal, Modified trapezoidal, hexagonal, rectangular and square gates

07

