Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – WINTER 2015

Subject Code: 172302 **Date:07/12/2015**

Subject Name: Plastic Mould and Die Design-I

Time: 10:30am to 1:00pm **Total Marks: 70**

Instructions:

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

Q.1 **(a)** Calculate the shot capacity of injection machine for the product shown in fig.[a]. **07**
Given Data : Bulk factor of PS = 1.4
Bulk factor of PP = 1.9
Specific gravity of PS= 1.04
Specific gravity of PP = 0.9

(b) For the product shown in fig[b], write down step by step machining . Mention the machine that is to be used in the tool room for various operations. **07**

Q.2 **(a)** Fill in the blanks: **07**

a. Material of Ejector pin is _____
b. For tall and hollow products, _____Ejection system is used.
c. Rectangular edge gate cannot be used for _____materials.
d. _____is the disadvantage of a pin gate.
e. Fan gate is used for _____products.
f. Material of construction of Insert is _____
g. Minimum diameter of a runner should be _____

(b) Discuss Pin Ejection in Detail. **07**

OR

(b) Discuss Sleeve Ejection in Detail. **07**

Q.3 **(a)** Write the function of : Lathe ; Shaping machine ; Drilling machine ; Grinding machine ; wire EDM ; milling machine ; honing machine. **07**

(b) Calculate the shot capacity of the injection moulding machine if a product of weight 15 gms is to be moulded in ABS and a 16 impression mould is desired. Assume: **07**
Bulk factor of PS = 1.9
Bulk factor of ABS = 1.8
Specific gravity of PS = 1.04
Specific gravity of ABS= 1.0

or

Q.3 **(a)** Discuss advantages, disadvantages and applications of Pin Gate; Submarine Gate ; Overlap gate ; rectangular edge gate; tab gate ; ring gate and diaphragm gate. **07**

(b) Discuss Air Ejection in detail. **07**

Q.4 **(a)** Calculate the efficiency of full round, half round, trapezoidal and hexagonal runners. **07**

(b) A rectangular box molded in PP has dimensions of 185x125x40mm. Top open, this box has wall thickness of 2mm throughout. If a 2 impression mould is desired , do the feed system calculations . **07**

or

Q.4 **(a)** Tick the correct one: **07**

1. Material of Bolster is (a) MS (b) EN-24 (c) EN-8 (d) EN 48B (e) none of these
2. Function of push back pin is [a] To eject the product. [b] to protect the core/cavity while mould opening.[c] to protect the core/cavity while mould closing [d] none of these.
3. Shaping operation removes metal in (a) Millimeters
   (b) Cms Microns (d) None of these
4. For removal of metal burrs from the holes , the operation done is [a] grinding [b] honing [c] reaming [d] polishing
5. Gate has a minimum cross sectional area due to : (a) To increase pressure drop (b) to offer resistance so that impression fills completely.(c) to decrease pressure drop (d) none of these.
6. Sleeve ejection is preferred for (a) short hollow products (b) tall hollow products (c) solid tall products (d) solid short products.
7. Function of Ejector retainer plate is (a) to hold the ejector element (b) to hold the ejector plate (c) to protect the ejector plate (d) none of these.

(b) For the product shown in fig.[a], design a hand injection mould . show all feed system calculations. **07**

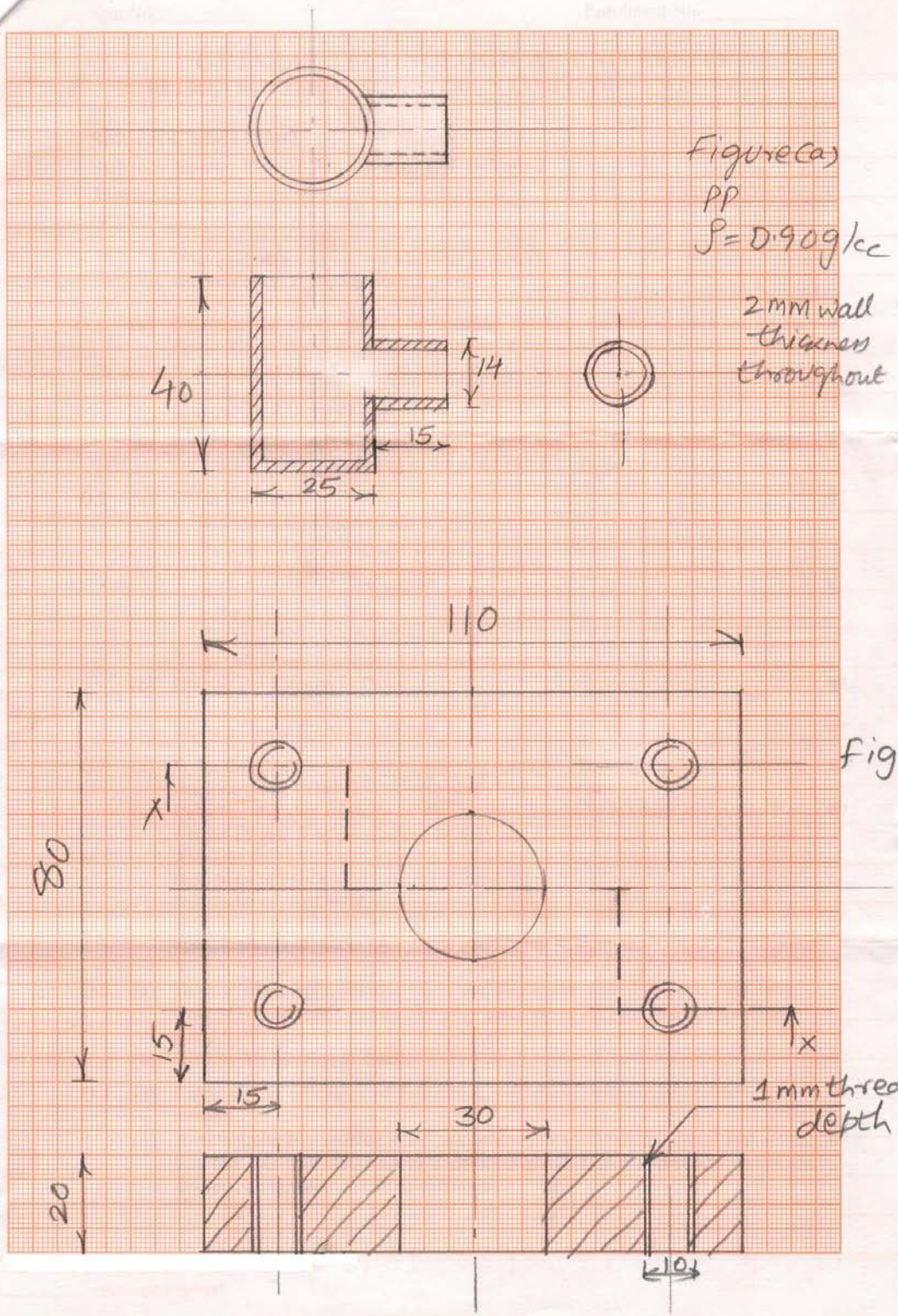
Q.5 **(a)** Differentiate between integer and insert type of mould. **07**

(b) Define : Mould, Runner, Gate, Sprue, Guide pin, Ejector rod, Push back pin **07**

OR

Q.5 **(a)** Discuss the requirements of a gate. **07**

(b) Discuss the wire EDM process. **07**


Figure(a)
PP
ρ = 0.90 g/cc
2mm wall thickness throughout
40
14
15
25
110
80
fig(b)
x
15
15
x
30
1mm thread depth
20
10