Total No of Questions: [10] *SEAT NO. :*

TE Production[2015 and2012 course]: End semester examination:May2018

Tool Design

(Semester - VI)

****

Time: 3 Hours *Max. Marks : 70*

Instructions to the candidates:

1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 ,Q7 or Q8, , Q9 or Q10*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right side indicate full marks.*
4) *Assume Suitable data if necessary*

****

Q1) **For the regular hexagonal [All sides are of equal length] component shown in Figure1. Determine**

i) Cutting force and press tonnage **[4]**

ii) Percentage utilization of the strip **[6]**

(Assume Strip length = 2440 mm,Thickness of strip= 2 mm, shear strengh of the material=200 N/mm^2)

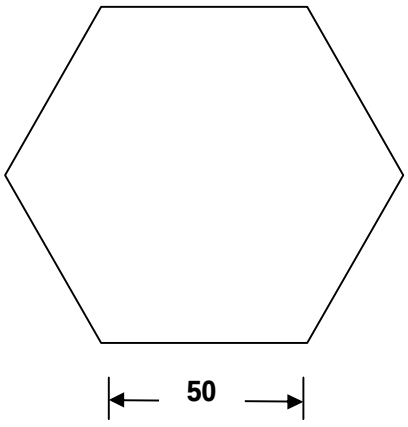

Figure 1

OR

Q2) **a) Explain 'Submerged plunger type' Die casting machine with neat sketch** **[6]**

b) Describe the function of 'Punch plate' with neat sketch **[4]**

Q3) **For the component as shown in Figure 2.Calculate**

1) **Blank size using Area method** **[4]**
2) **Percent reduction and Number of draws required** **[2]**
3) **Diameter and height of cup in each draw** **[4]**

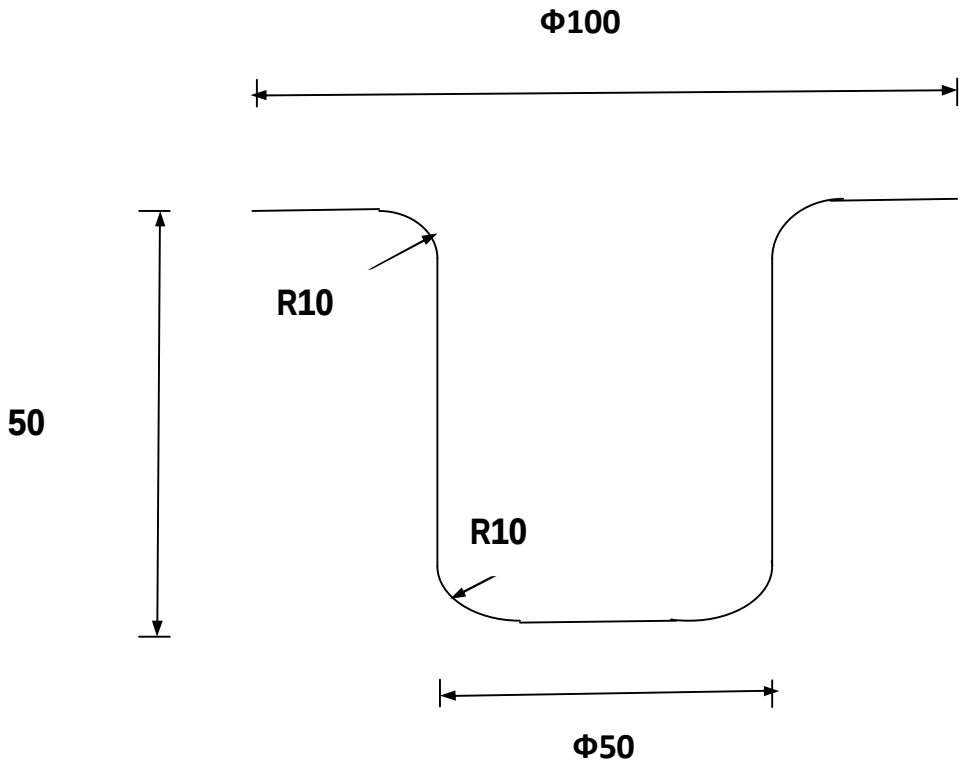

Figure 2

OR

Q4) **a)** **Explain 'Gooseneck type' Die casting machine with neat sketch** **[6]**

b) **Describe the function of 'Back up plate' with neat sketch** **[4]**

Q5) **a)** **Explain rules of upsetting to design an upsetting die** **[9]**

b) **Explain the process to design edging impression with suitable forged component considering appropriate dimensions** **[9]**

OR

Q6 **Design an upsetting die for the component shown in Figure 3.** **[18]**
(Material density = 7.859 gm / cm^3)

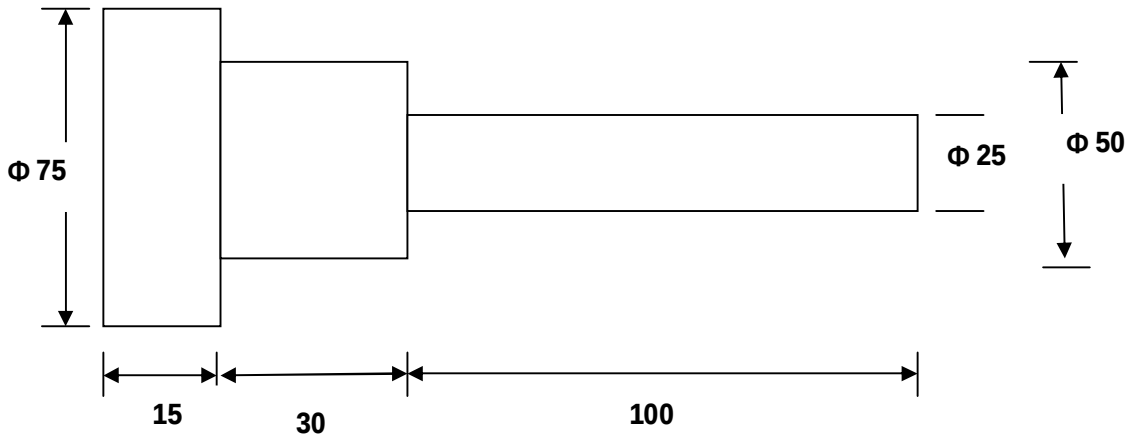

Figure 3

Q7) **a)** **Describe the process to make plastic (polymers).** **[8]**
Also explain and differentiate between Thermoplastic and Thermosetting.

b) **Describe the plastic processing method to manufacture plastic bottle.** **[8]**

OR

Q8) **a)** **Describe Injection molding terminology with neat sketch of multi cavity mold.** **[8]**

b) **Explain Rotational Molding with neat sketch. State the its applications.** **[8]**

Q9) **a)** **State various runner profiles with neat sketch.** **[8]**
Explain the important factors to be considered while runner designs.

b) **Explain Overlap gate with neat sketch. State advantages and limitations.** **[8]**
Determine the rectangular edge gate dimension (length, depth, width) for the component of material polycarbonate having wall thickness 1.5 mm and surface area 3400 mm^2.
The material constant for polycarbonate is 0.7.

OR

Q10) **a)** **Explain 'Ejector plate assembly' system of injection molding with neat sketch.** **[8]**

b) **Determine number of impressions for minimum cost for injection molding of component having weight 142 gm. Shot weight handling capacities for various molding machines along with machine hour rate is given below:** **[8]**

Capacity(kg)	1	2	3	4
Machine hour rate (Rs)	40	60	80	90

Given that: Quantity to be produced=50000 Cycle time=30 sec,
Cost of producing one impression=Rs. 3400