Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER • 2015

Subject code: 152502 **Date: 05/05/2015**

Subject Name: Tool Design

Time: 02.30pm-05.00pm **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)**	Discuss various types of chips produced during metal cutting.	**07**
	(b)	Explain in brief various types of press operations.	**07**
Q.2	**(a)**	What are various Location Devices? Explain these with the aid of suitable sketches.	**07**
	(b)	Design "GO" and "NO GO" ends of Plug Gauge to measure a hole size of 28.000 $\pm$ 0.014 mm adopting (i) Uni-lateral System and (ii) Bi-lateral System	**07**
		OR	
	(b)	Discuss Taylor's Principle of Gauge design.	**04**
	(c)	What is Tool Design? Explain how it is related to Process Planning?	**03**
Q.3	**(a)**	The symmetrical cup work piece shown in figure (i), is to be made from cold rolled steel 0.8mm thick. Make the necessary calculations for designing the drawing die for this part.	**07**
	(b)	Discuss various types of Tool wear.	**07**
		OR	
Q.3	**(a)**	Design and draw die and punch assembly for the component as shown in the figure (ii). Take shear stress as 400 N/mm^2, also calculate centre of pressure, draw strip layout and find percentage utilization.	**14**
Q.4	**(a)**	Discuss various types of Cutting fluids with their related functions, characteristics and applications.	**07**
	(b)	Differentiate between "ASA" and "ORS" system to designate the tool shape.	**07**
		OR	
Q.4	**(a)**	What is a chip breaker? Discuss various types of chip breakers and explain how does a chip breaker break up a chip?	**07**
	(b)	Discuss following design features of a milling cutter: (i) Size of cutter, (ii) Tool angle, (iii) Width of Land, (iv) Number of teeth, (v) Power requirements for milling, (vi) Flutes	**07**
Q.5	**(a)**	Write a short note on advanced cutting tool materials.	**07**
	(b)	What is six point location principal? Explain it with the help of suitable sketches.	**07**
		OR	
Q.5	**(a)**	Name various types of Jigs and explain any three with the help of	**07**

suitable sketches.

(b) Define following terms: **07**

(i) Interchangeability, (ii) Tolerance,
(iii) Allowance, (iv) Upper deviation,
(v) Lower deviation, (vi) Fundamental deviation and (vii) Fit.

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Figures:

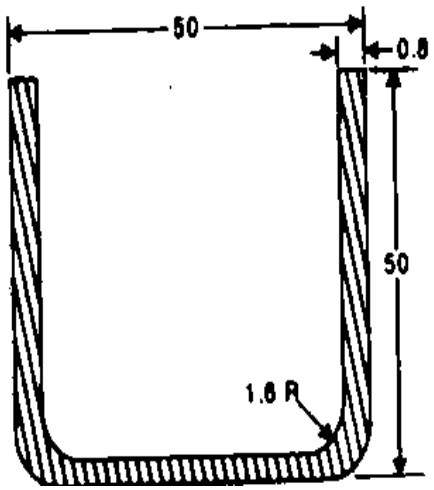

Figure (i), Q. 3(a)

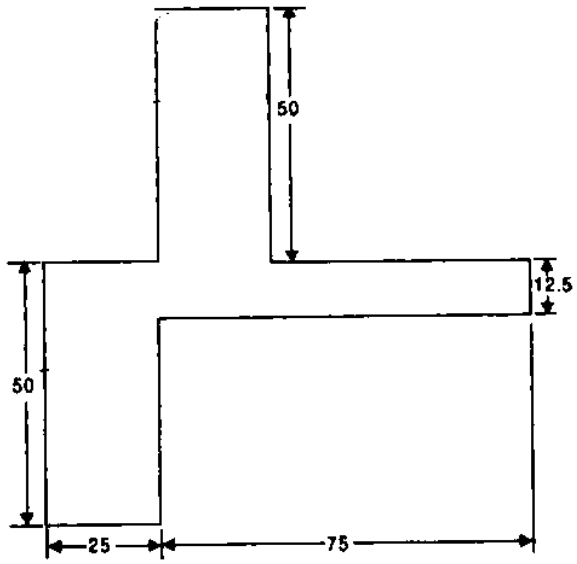

Figure (ii), Q.3 (a) OR