

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2152507****Date: 20/06/2019****Subject Name: Tool Engineering****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

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

		MARKS
Q.1	(a) Define with example the concept of “Tool Design”	03
	(b) How cutting tools are classified name few tools of each type.	04
	(c) Explain the mechanism of chip formation and discuss the types of chips with neat sketch	07
Q.2	(a) Draw neat sketch of single point cutting tool with label of six major angles and other terminology of it.	03
	(b) Classify the types of cutting fluids and state their application	04
	(c) Explain designation of cutting tools- ASA system and ORS system.	07
OR		
	(c) Demonstrate configuration and working principle of some common type chip breakers	07
Q.3	(a) What it means by tool life? Which are the factors affecting tool life.	03
	(b) Classify, illustrate the properties and suggest the applications of the cutting tool materials	04
	(c) Draw Merchant’s Circle Diagram and show the forces and their relations	07
OR		
Q.3	(a) State the effects of cutting temperature on cutting tool and job.	03
	(b) Define single point cutting tool. Explain various methods of manufacturing single point cutting tool.	04
	(c) In an orthogonal cutting operation Cutting force $F_v = 1000$ N, Feed force $F_t = 0$, Rake angle = 45° , Shear angle = 45° Determine (a) the coefficient of friction, (b) the shear power if Shear velocity $V_s = 20$ m/min, and (c) the cutting power.	07
Q.4	(a) Explain fool proofing with neat sketch.	03
	(b) Explain types of clamping devices with neat sketch.	04
	(c) Explain the principle of ‘Six point location’	07
OR		
Q.4	(a) Explain in brief hydraulic clamp.	03
	(b) Explain various multi point cutting tools with their features, working and applications.	04
	(c) How cutting force is calculated for press work. What are the various methods for reducing force requirements?	07

- Q.5** (a) Name and explain various sheet metal operations. **03**
(b) What is shear on punch and die? How it is applied to punch and die for blanking and piercing operation? **04**
(c) Design a jig for a pre-machined hollow metallic disc six equispaced blind holes to be drilled radially. **07**

OR

- Q.5** (a) Explain in brief Indexing jig. **03**
(b) What is center of pressure for sheet metal working? **04**
(c) Explain in brief two pass layout in press work with suitable example. **07**
