Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

Subject Code:2152507 Date:11/12/2018

Subject Name:Tool Engineering

Time: 10:30 AM TO 01:00 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)**	What is tool design? Explain how it is related to process planning?	**03**
	(b)	Explain the types of tool wear.	**04**
	(c)	Explain the mechanics of metal cutting.	**07**
Q.2	**(a)**	State the characteristics of cutting fluids and explain any one.	**03**
	(b)	Explain the variables affecting on tool life.	**04**
	(c)	Derive the equation of shear angle.	**07**
		OR	
	(c)	Draw the merchant circle diagram and state its assumptions.	**07**
Q.3	**(a)**	Draw the geometry of single point cutting tool.	**03**
	(b)	Differentiate between "ASA" and "ORS" system to designate the tool shape.	**04**
	(c)	Explain the design feature of twist drill.	**07**
		OR	
Q.3	**(a)**	Give the specific application of following cutting tool material (i) HSS (ii) CBN and (iii) Diamond.	**03**
	(b)	Describe the factors affecting on the selection of cutting tool materials.	**04**
	(c)	Alloy steel having a hardness of 250 BHN is to be machined in milling machine. The depth of cut is to be 6.35 mm, feed is 0.13 mm per tooth and the cutting speed is 1.5m/s. The milling cutter has 12 teeth and is 25 cm in diameter. The width of the cut is 12.5 cm. Find the horsepower. Take machinability factor as 8 cm^3/min/hpc.	**07**
Q.4	**(a)**	Enlist the factors affecting on the selection of press machine.	**03**
	(b)	Define the term: (i) Perforating (ii) Punching (iii) Notching (iv) Slitting	**04**
	(c)	Sketch and explain: Blanking die, compound die, combination die and progressive die.	**07**
		OR	
Q.4	**(a)**	Discuss the "Springback" phenomenon in press tool.	**03**
	(b)	Differentiate between jig and fixture.	**04**
	(c)	Define strip layout and explain the factors affecting the strip layout.	**07**
Q.5	**(a)**	Explain 3-2-1 locating principle.	**03**
	(b)	Enlist the design principle for jig and fixtures.	**04**
	(c)	List the various types of locating devices used for both Jigs and Fixture and explain any two with neat sketch.	**07**
		OR	
Q.5	**(a)**	Explain the V-Block as a locator.	**03**
	(b)	Describe the various types of fixtures used for the Grinding Machine.	**04**
	(c)	Discuss the design steps for jig and fixture.	**07**

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