

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VIII (Old) EXAMINATION – WINTER 2019****Subject Code: 181903****Date: 25/11/2019****Subject Name: Production Technology****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.

- Q.1** (a) Define Non-conventional machining? Why do we need these processes? Give classification of the Non conventional processes? **07**
- (b) Draw neat sketch of single point cutting tool indicating its complete geometry. **07**
- Q.2** (a) Draw Merchant's force diagram. Derive the equations for frictional force, normal reaction, shear force and normal force. **07**
- (b) In orthogonal cutting, the feed of tool is 1.25 mm/rev and chip thickness after cutting is 2 mm. The tool bit has a rake angle of 10°. If shear strength = 600 N/mm<sup>2</sup>, Width of cut = 10 mm, Cutting speed = 30 m/min, Co-efficient of friction = 0.9, Determine the (1) Chip thickness ratio (2) Shear angle (3) Shear force (4) Friction angle (5) Cutting force and (6) Horse power at cutting tool. **07**
- OR**
- (b) The following equation for tool life is given for a turning operation, **07**
- $$V T^{0.13} f^{0.77} d^{0.37} = C$$
- A 60 min tool life was obtained while cutting at V = 30 m/min, f = 0.3 mm/rev and d = 2.5mm. Determine the changes in tool-life if the cutting speed, feed and depth of cut are increased by 20% individually and also taken together.
- Q.3** (a) Enlist various thread manufacturing processes? Explain with neat sketch. **07**
- (b) Compare gear Hobbing and gear Shaping processes with neat diagrams. **07**
- OR**
- Q.3** (a) Differentiate between Jigs and Fixture. Enlist different types of clamping devices. Explain any two with neat sketches. **07**
- (b) List various principles of location and explain 3-2-1 Principal of Location with neat sketches. **07**
- Q.4** (a) Enlist methods to measure cutting temperature and explain any two. **07**
- (b) Explain various machine tool structures, based on rigidity. **07**
- OR**
- Q.4** (a) Explain significance of center of pressure in design of press tools. How is it calculated? **07**
- (b) Describe the common bending operations performed on presses. **07**
- Q.5** (a) What are guide-ways? What are the principal requirements of them? Enlist various types of guide ways used in machine tools. Explain any two in detail. **07**
- (b) What is difference between a Capstan & Turret lathe? Describe in brief with the help of suitable sketch. **07**
- OR**
- Q.5** (a) Explain working principle of EDM. What are main process parameters? State advantages, disadvantages and applications of EDM. **07**
- (b) Explain principle of Ultrasonic machining with help of neat diagram. State its advantages and application. **07**

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