

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013

Subject Code: 181903**Date: 15/05/2013****Subject Name: Production Technology****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.

- Q.1** (a) Define Non-conventional machining? Why do we need these processes? **07**
 Give classification of the Non conventional processes?
 (b) Distinguish between jig and fixture. State advantages of jigs and fixtures. **07**

- Q.2** (a) Write in detail the methods of reducing the cutting forces in press **07**
 working.
 (b) Discuss the various types of pilots used in progressive die. **07**

OR

- (b) Sketch and design a progressive die to make a steel washer 30 mm outside **07**
 diameter with 15 mm hole. From 1.6 mm thick steel sheet. The ultimate
 shear strength of the material is 320 N/mm². Calculate,
 a. Maximum punch force necessary to blank and punch the washer if
 both punches operate at the same time.
 b. Punch and die size for piercing and blanking operation

- Q.3** (a) Write short note on Lathe tool Dynamometer. **07**
 (b) In orthogonal cutting, if the feed is 1.25 mm/rev and chip thickness after **07**
 cutting is 2mm, determine the following.

1. Chip thickness ratio
2. Shear angle

The tool bit has a rake angle of 10°.

If shear strength = 600 N/mm²

Width of cut = 10 mm

Cutting speed = 30 m/min

Co-efficient of friction = 0.9

Determine,

- a. Shear force
- b. Friction angle
- c. Cutting force
- d. Horse power at the cutting tool

OR

- Q.3** (a) Draw Merchant's force diagram. Derive the equations for frictional force, **07**
 normal reaction, shear force and normal force.
 (b) The following equation for tool life has been obtained for H. S. S. tool. **07**

$$VT^{0.13} f^{0.6} d^{0.3} = C$$

A 60 minute tool life was obtained while cutting at V = 40 m/min, f = 0.25 mm/rev and d = 2 mm.

Calculate the effect on tool life if speed, feed and depth of cut are together increased by 25% and also if they are increased individually by 25%. Also give your comments.

- Q.4** (a) What is LASER? Explain LBM. **07**
(b) Describe the degrees of freedom for workpiece located in space. Draw a simple sketch to show the 3-2-1 locating principle and explain. **07**

OR

- Q.4** (a) List various clamping devices used in jigs and fixtures. Sketch any two clamping devices and explain its working. **07**
(b) Write important functions of dielectric fluid and electrolyte. Also write various types of commonly used dielectric fluid and electrolyte. **07**

- Q.5** (a) Explain with the help of sketch, principle, types, and applications of gear hobbing. **07**
(b) Describe the essential parts of turret lathe. What is the field of application of turret lathe? **07**

OR

- Q.5** (a) Write short note on Gear finishing process. **07**
(b) Discuss the various types of multi spindle automats. **07**
