

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VIII • EXAMINATION – SUMMER 2014

Subject Code: 181903**Date: 03-06-2014****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) What are the main characteristics of cutting tool materials **03**
 (b) Explain in brief Taylor's relationship for cutting speed-tool life. **04**
 (c) During an orthogonal machining (turning) operation of C-40 steel, the following data were obtained. **07**

- (1) Chip thickness = 0.45mm
- (2) Width of cut = 2.5mm
- (3) Feed = 0.25mm/rev
- (4) Tangential cut force = 1130N
- (5) Feed thrust force = 295N
- (6) Cutting speed = 2.5m/s
- (7) Rake angle = 10°

Calculate (1) Force of shear at shear plane
 (2) Kinetic co-efficient of friction.

- Q.2** (a) Discuss various types of tool wears and their causes. **07**
 (b) A 300mm dia. bar is turned at 45rev/min with depth of cut of 2mm and feed of 0.3mm/rev. The forces measured at the cutting tool point are **07**

Cutting force = 1850N
 Feed force = 450N

Calculate (1) power consumption
 (2) specific cutting energy

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 $V = 30\text{m/min}$, $f = 0.3\text{mm/rev}$ and $d = 2.5\text{mm}$

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) Classify various non-conventional machining processes. **07**
 (b) Explain the working principle of EDM. What are the main process parameters . State advantages of EDM. **07**

OR

- Q.3** (a) State various thread manufacturing methods. **03**
 (b) Differentiate between gear forming and gear generating methods. **04**
 (c) Explain gear finishing processes. **07**
Q.4 (a) What are the advantages of using jigs and fixtures. **03**
 (b) Explain in brief Angle jig. **04**
 (c) Explain basic design steps for cam for single spindle automat. **07**

OR

- Q.4 (a)** Explain in brief hydraulic clamp. **03**
Q.4 (b) Explain in brief Indexing jig by taking suitable example. **04**
(c) Differentiate between Capstan and turret lathe **07**

- Q.5 (a)** How cutting force is calculated for press work. What are the various methods for reducing force requirements. **07**
(b) Explain in brief two pass layout in press work by taking suitable example. **07**

OR

- Q.5 (a)** Explain various methods of mounting of punches. **07**
(b) Explain various machine tool structures, based on rigidity. **07**
