Seat No.: _____ Enrolment No._____

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 = 30m/min, f = 0.3mm/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)** 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**

****