Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Production Technology
Subject Code: 4TE06PTE1 **Branch: B.Tech (Mechanical)**

Semester: 6 **Date: 02/05/2018** **Time: 02:30 To 05:30** **Marks: 70**

Instructions:
(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

(a)	What is tool life?	**(1)**
(b)	Enlist types of Jig.	**(1)**
(c)	How the Hardness ratio affects the material removal rate of USM.	**(1)**
(d)	List the various types of locating devices used for both Jigs and Fixture.	**(1)**
(e)	Explain the function of Knock out.	**(1)**
(f)	What are common ejecting mechanisms used in power presses?	**(1)**
(g)	Define: "machinability".	**(1)**
(h)	What are the different methods of gear manufacturing?	**(1)**
(i)	What do you mean by chip with built up edge?	**(1)**
(j)	Which punch increases the life of punch?	**(1)**
(k)	What factors are responsible for continuous chip formation?	**(1)**
(l)	What is the effect of shear angles on product quality?	**(1)**
(m)	Which materials that are used for EDM tool?	**(1)**
(n)	What do you mean by MMR in unconventional machining?	**(1)**

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

(a)	What is the difference between threading and tapping?	**(02)**
(b)	Draw neat sketch of chip formation in metal cutting.	**(04)**
(c)	Differentiate Between (i) Capstan and Turret lathes (ii) Piercing and Blanking operation	**(08)**

Q-3 **Attempt all questions** **(14)**

(a)	Distinguish between a Jig and Fixture. Sketch different drill bushes useful in drill jigs.	**(07)**
(b)	How are unconventional machining methods classified? Compare LBM and EBM process with different factors which consider for classification of unconventional machining.	**(07)**

Q-4 **Attempt all questions** **(14)**

(a) 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.

(b) Write short note on Gear finishing process. **(07)**

Q-5 **Attempt all questions** **(14)**

(a) Determine the shear plane angle, cutting force component and resultant force on the tool for orthogonal cutting of a material with yield stress of 250 N/mm2. Following are the machining parameters. **(07)**

Tool Rake angle = 15°
Uncut chip thickness = 0.25 mm
Chip width = 2 mm
Chip thickness ratio = 0.46
Angle of friction = 40°

(b) Write in detail the methods of reducing the cutting forces in press working. **(07)**

Q-6 **Attempt all questions** **(14)**

(a) The cutting force and thrust force in an orthogonal cutting operation are 1470 N and 1589 N, respectively. The rake angle = 5°, the width of the cut = 5.0 mm, the chip thickness before the cut = 0.6, and the chip thickness ratio = 0.38. Determine: **(06)**

(a) The shear strength of the work material and
(b) The coefficient of friction in the operation.

(b) Derive following equation for calculation of shear angle in metal cutting operation. **(05)**

$$\tan \phi = \frac{r \cos \alpha}{1 - r \sin \alpha}$$

Where, r = chip thickness ratio, α = rack angle and ø = shear angle

(c) Classify the generating process for gear cutting? **(03)**

Q-7 **Attempt all questions** **(14)**

(a) Explain single spindle automates and transfer machines with suitable example. **(06)**

(b) Explain Merchant's force circle diagram and write equation of forces. **(06)**

(c) What are automatic transfer machines? **(02)**

Q-8 **Attempt all questions** **(14)**

(a) Write a note on gear cutting by milling. **(06)**

(b) Explain various types of single point cutting tools. State advantages of mechanically held inserted tools. **(04)**

(c) Write duties and responsibilities of Production Engineer in any esteemed organization. **(04)**