PAPER CODE - 54007

B Tech Mechanical Engg 4th Sem Me

University Institute of Engineering & Technology
(Recognised Under Section 2(f) and 12B of UGC)
Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – MAY 2019	
B.TECH – MECHANICAL ENGINEERING	SEMESTER – 4TH

TIME – 3 Hrs.

M.M. - 75

COURSE NO. - ME -202

COURSE TITLE - PRODUCTION TECHNOLOGY-I

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit. Assume any missing data.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. **15x1=15**

(i)	Describe the principle of auto collimator.			
(ii)	Classify the different types of drills.			
(iii)	Define machinability index.			
(iv)	Differentiate between up milling and down milling with the help of sketch.			
(v)	Crater wear occurs mainly due to (a) abrasion (b) diffusion (c) oxidation (d) adhesion			
(vi)	Calculate the machining time for drilling 4 holes of 16 mm diameter each on a flange if flange thickness = 30 mm, cutting speed = 438 rpm and feed = 0.2 mm/rev.			
(vii)	Select true or false: The size of a cylindrical grinder is designated by the diameter and length of the largest workpiece that the machine can accommodate between centres. (True/False).			
	Match the following:			
(viii)	1.	Ernst and Merchant		$\beta+\phi-\alpha/2=\pi/4$
(ix)	2.	Merchant's second solution		$\beta+\phi-\alpha=\pi/4$
(x)	3.	Lee and Shaffer		$2\beta+\phi-\alpha=\pi/2$
(xi)	4.	Stabler		$2\beta+\phi-\alpha=C_m$
	Match the effect on surface finish in Column B if the variable in column A is increased:			
	Column A		**Column B**	
(xii)	1.	Rake angle	A	Large deterioration
(xiii)	2.	Relief angle	B	Large improvement
(xiv)	3.	Side cutting edge angle	C	Slight deterioration
(xv)	4.	End cutting edge angle	D	Slight to large improvement

PART-B (20 Marks)

	UNIT-I	
2	What is meant by tool signature? A tool carries 5-10-6-6-8-10-1 signature. Describe it in A.S.A. system.	5
	UNIT-II	
3	What do you understand by machinability? By which parameters is it generally influenced?	5

	UNIT-III	
4	How do you perform differential indexing? In what cases it is to be used?	5
	UNIT-IV	
5	What is surface finish? Explain the factors affecting surface finish in machining.	5

PART-C (40 Marks)

	UNIT-I	
6	Explain mechanism of chip formation with neat sketches. Explain various types of chips with neat sketches.	10
7	In an Orthogonal turning operation on a Lathe the following data were obtained: Cutting speed = 120 m/min Diameter of workpiece = 100 mm Cutting force = 180 kg Feed force = 60 kg Back rake angle = 10 Feed rate = 0.3 mm/rev Chip thickness = 0.4 mm Depth of cut = 0.3 mm Calculate: Chip thickness ratio, shear plane angle, coefficient of friction, friction angle, shear stress, shear strain, strain energy and chip flow velocity.	10
	UNIT-II	
8	Define tool life. What are the main factors which influence the tool life?	10
9	During machining of a component on a Lathe the following data were available: Machining constant (C) = 80 Tool changing time = 4 minutes Tool regrinding time = 2.5 minutes Tool depreciation cost = Rs. 1/- per grind Machining cost = 40 paise/min Labour + Overheads = 25/min Work loading and unloading time = 40 secs Feed rate = 0.3 mm/rev Exponent (n) = 0.2 Job length = 200 mm Cutting speed = 25 m/min Workpiece dia = 60 mm Idle time per workpiece = 3 minutes Tool regrinding cost = Rs. 1.50/grind	10
	UNIT-III	
10	Make a neat sketch of column and knee type milling machine and describe its main parts.	10
11	What are the common operations which can be performed on a drilling machine? Describe them in brief with the help of a neat sketch.	10
	UNIT-IV	
12	Discuss how the size of following specified: (i) Horizontal boring machine (ii) Gear teeth generating machines (iii) Drills	10
13	What are the common instruments and devices used for testing (a) straightness, (b) flatness and (c) squareness of a flat surface?	10