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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fourth Semester, B.E. - Mechanical Engineering

Semester End Examination; June - 2016

Manufacturing Processes - II

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each **unit**.*
ii) Use of thermodynamic data handbook is permitted.

UNIT - I

1 a. Explain the Nomenclature of a single point cutting tool. 5

b. Discuss about high-speed steel, cemented carbide and coated carbide, tool material preparation. 12

c. What are the assumptions made in Earnest-merchant theory? 3

2 a. Explain the mechanism of chip formation. 6

b. Construct the merchant circle diagram. 6

c. An MS specimen is turned at a cutting speed of 20 m/min using a tool of rake angle 10^o. The uncut chip thickness is 0.3 mm and the width of cut 2.5 mm. The average value of coefficient of friction between the tool and chip is 0.5. The average shear stress the material of the work can withstand 410 N/mm^2. Determine; 8

i) The shear angle ii) The cutting component of the force

iii) Thrust component of the force iv) Power consumed in cutting.

UNIT - II

3 a. What parameters influence heat generation in cutting? 8

b. Write a note on cutting tool failure. 5

c. A 50 mm dia. MS rod is turned at 300 rpm. The tool failure occurs in 10 min. The speed was changed to 200 rpm and tool failure occurred after 50 min. Calculate the cutting speed to obtain a tool life of 30 min. 7

4 a. What methods are used for determination of Tool tip temperature? Explain any two types. 6

b. Explain the following : 10

i) Functions of cutting fluids

ii) Selection of cutting fluids.

c. Write a note on tool wear. 4

UNIT - III

5 a. With a neat sketch explain Turret lathe. 10

b. State the main differences between shaper and planer. 5

Contd…2

	c.	A shaper is operated at 120 cutting strokes per minute and is used to machine a work piece 250 mm length and 120 mm in width. Assuming a feed rate of 0.6 mm per stroke and a depth of cut 3 mm. Calculate the total time of machining the component. The forward stroke is completed in 230º of crank rotation. Assume approach distance of 25 mm.	5
6	a.	Sketch and explain three types of quick return mechanism in shaper machine.	13
	b.	Explain compound rest swivel and Tail stock set over taper Turing methods.	7

UNIT - IV

7	a.	Sketch a plain milling cutter to show its geometry and nomenclature.	6
	b.	Sketch and explain horizontal milling machine.	8
	c.	State the main differences between upmilling and Down milling.	6
8	a.	With neat sketch explain the following : (i) Compound Indexing (ii) Differential Indexing.	11
	b.	With a neat sketch explain, plain milling, face milling and End milling.	9

UNIT - V

9	a.	With neat sketch explain centreless grinding.	8
	b.	What are the purpose of Honing and Lapping? Explain Honing.	5
	c.	Draw a neat sketch of a radial drilling machine, label the parts and explain.	7
10	a.	Sketch and explain the following drilling operations : (i) Reaming (ii) Boring (iii) Tapping (iv) Counter- sinking.	16
	b.	List the different types of bonding method for grinding wheel. Explain the manufacture and properties of shellac Bond method.	4

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