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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/July - 2015

Manufacturing Process - II

Time: 3 hrs *Max. Marks: 100*

***Note** : Answer **FIVE** full questions, selecting **ONE** full question from each **Unit**.*

UNIT – I

1. a. Briefly explain the mechanism and types of Chip formation with neat sketches. 10

   b. Derive an expression for the shear angle in orthogonal cutting in terms of a rake angle and chip thickness ratio. 6

   c. List the properties of Ceramics. 4

2 a. Write a short notes on: 8

   (i) HSS (ii) CBN

   b. The following details relates to an orthogonal cutting operation. Feed = 1.25 mm/rev, Chip thickness 2 mm, rake angle of tool 10°. Calculate; (i) Chip thickness ratio and shear angle (ii) If the shear strength is 6000 kg/cm^2, width of cut 10 mm, cutting speed 30 mpm and coefficient of friction 0.9; determine the following: 12

   (I) Shearing force (II) Friction angle (III) Cutting Force (IV) Thrust force

UNIT – II

3 a. List the functions of cutting fluid. 4

   b. Explain the factors which affect the tool life. 8

   c. A Lathe running at a speed of 30 m/min cuts a mild steel rod of 160 mm diameter with a HSS tool. The life of the tool under this condition was observed to be 2.1 hours. When the cutting speed was reduced to 25 m/min, the tool life was observed to be 5.2 hours. Calculate the value of the constant C and the exponent n in the tool life equation. 8

4 a. List and explain different types of tool wear. 10

   b. The total life for a HSS tool is expressed by the relation $VT^{1/7} = C_1$ and for tungsten carbide $VT^{1/5} = C_2$. If the tool life for a cutting speed of 24 m/min is 128 min. Compare the life of the two tools at a speed of 30 m/min. 10

UNIT - III

5 a. Define cutting speed, feed and depth of cut. 9

   b. Explain with neat sketch turret lathe and labeling the parts of turret lathe. 11

Contd…2

6. a.	Differentiate between shaping and planning machines.	6
b.	Sketch and Explain double housing planner.	10
c.	List the specifications of a shaper.	4

UNIT – IV

7 a.	Define indexing. Explain briefly simple and compound indexing methods.	10
b.	Sketch and Explain:	
	(i) up milling (ii) down milling	10
	(iii) Straddle milling (iv) Face milling	
8 a.	Sketch and Explain universal milling machine.	10
b.	List the different types of milling machines.	5
c.	Write short notes on milling operations.	5

UNIT - V

9 a.	Sketch and Explain any four drilling related operations.	16
b.	List the important application of radial drilling machines.	4
10 a.	What are the factors considered in the selection of a grinding wheel? Explain briefly.	10
b.	Sketch and Explain centre less grinding.	10

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