



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

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B.E. - Mechanical Engineering

Semester End Examination; May/June - 2018

Manufacturing Process - II

Time: 3 hrs

Max. Marks: 100

Note: i) Answer FIVE full questions, selecting ONE full question from each unit.

ii) Any missing data may be assumed suitably.

UNIT - I

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| 1 a. | Derive an expression for shear angle in testing of chip thickness ratio and rake angle for orthogonal cutting. | 10 |
| | b. Differentiate between orthogonal cutting and oblique cutting. | 5 |
| | c. With a neat sketch, explain mechanism of chip formation. | 5 |
| 2 a. | What are the desirable properties of cutting tool materials? | 5 |
| | b. Define the following terms : | 5 |
| | i) Chip thickness ratio ii) Shear angle | |
| | c. Write short notes on the following cutting tool materials : | 10 |
| | i) High speed steels ii) Cubic Boron Nitride iii) Ceramics | |

UNIT - II

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|------|--|----|
| 3 a. | Define tool life. What are the factors depending on tool life? | 6 |
| | b. List out the cutting fluids along with properties. | 4 |
| | c. When HSS is used to machine mild steel following details are obtained:
Tool life = 2 hrs, $n = 0.27$, speed = 50 meters/min, then the speed was increased by 25%.
Calculate the tool life and to obtain 3 hours tool life. What is the speed at which job is to be machined? | 10 |
| 4 a. | Explain any one method of measuring tool tip temperature. | 8 |
| | b. Explain the three zones of heat generation in metal cutting. | 8 |
| | c. Sketch crater wear and flank wear. | 4 |

UNIT - III

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| 5 a. | With a neat sketch, explain the parts of a turret lathe. | 8 |
| | b. Explain thread cutting operation in a lathe. | 6 |
| | c. Determine the machinery time required for machining of a work 350 mm long and 50 mm diameter in a lathe. The cutting speed is 30 m/min and the feed rate is 0.4 mm per revolution. | 6 |
| 6 a. | With a neat sketch, explain the parts of a horizontal shaper. | 8 |
| | b. With a neat sketch, explain the crank and slotted link quick return mechanism. | 8 |
| | c. Differentiate between Shaper and Planer (Any four). | 4 |

UNIT - IV

- 7 a. With a neat sketch explain the nomenclature of a milling cutter. 8
- b. Explain the following milling operation : 8
- i) Straddle milling ii) Angular milling
- c. Classify Milling machines. 4
- 8 a. Differentiate between up-milling and down-milling (Any four). 4
- b. Define indexing. List the methods of indexing. 6
- c. Index 91 divisions using compound indexing the following Index plates are available :

Plate No-1	15	16	17	18	19	20
Plate No-2	21	23	27	29	31	33
Plate No-3	37	39	41	43	47	49

10

UNIT - V

- 9 a. With a neat sketch, explain the radial drilling machine. 8
- b. with a neat sketch, explain following drilling operations : 8
- i) Reaming
- ii) Boring
- iii) Spot facing
- c. List the types of drills. 4
- 10 a. Explain types of abrasives and any two bonding processes. 8
- b. With a neat sketch, explain centreless grinding machine. 6
- c. Define lapping. With a neat sketch, explain the principle of operation of lapping. 6

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