

B.Tech III Year II Semester (R13) Regular Examinations May/June 2016

MACHINE TOOLS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) Define cutting ratio?
 - (b) What are the classifications of cutting tools?
 - (c) What is orthogonal rake angle?
 - (d) What are the different types of operations done on a lathe?
 - (e) What is the universal shaper?
 - (f) What is the edge planner?
 - (g) What is the fine boring machine?
 - (h) What are the various cutter holding devices used in milling machine?
 - (i) What are the natural and artificial abrasives?
 - (j) What do you mean by Jig and Fixtures?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 (a) What are the common methods of chip breaking and what are the means used for the same?
- (b) Draw the Merchant's Circle diagram and derive the expressions to show the relationships among the different forces acting on the cutting tools and different parameters involved in metal cutting.

OR

- 3 (a) How many types of chips are formed in metal cutting? What factors are responsible for formation of these different types of chips? What is built up edge?
- (b) What is meant by orthogonal cutting and oblique cutting?

UNIT – II

- 4 (a) Discuss the relative merits and demerits of the four methods of machining external taper on the Lathe.
- (b) Discuss briefly any three types of tool holders used on turret Lathe.

OR

- 5 (a) Describe various taper turning processes used for products of taper work on lathes and compare their relative merits.
- (b) How are the sizes of turret and capstan lathes specified?

UNIT – III

- 6 (a) Sketch a few work holding devices used in drilling machine.
- (b) What are the different mechanisms used for driving the ram of a slotting machine? Explain any one of them.

OR

- 7 (a) Sketch and describe a hydraulic circuit for a shaper. What are the advantages and disadvantages of Hydraulic activating Machine tools?
- (b) Enumerate different operations that can be done on a drilling machine.

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UNIT – IV

- 8 (a) Write short notes on the following milling operations:
(i) Face milling.
(ii) Straddle milling.
(iii) End milling.
(iv) Gang milling.
(b) Explain in detail the various types of natural and artificial abrasives.

OR

- 9 (a) What is a plain milling machine? Describe its main features with help of block diagram.
(b) How honing is done? How does it differ from lapping? Discuss.

UNIT – V

- 10 (a) What are the main differences between a jig and a fixture?
(b) Describe the degree of freedom of a work piece located in space.

OR

- 11 What are the two basic principles of designing the jigs and fixtures? State the degree of freedom and how would you restrict them. Why?
