Code: 13A03602 **R13**

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)

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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 ate 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 clips? 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?

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