Code: 15A03503 **R15**

B.Tech III Year I Semester (R15) Regular Examinations November/December 2017

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) What are the various types of chip breakers?
(b) Discuss the significance of cutting tool materials.
(c) List out the different types of lathe machines.
(d) What are the tool holding devices used on lathe?
(e) What is machining time?
(f) Sketch the table feed mechanism used in planar.
(g) How differential indexing differs from simple indexing.
(h) Distinguish between dressing and truing.
(i) What are the types of clamping used in machine tools?
(j) Highlight the applications of UBMTS.

PART – B

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

UNIT – I

2 (a) What is meant by tool signature? Describe tool signature of single point cutting tool.
(b) Derive an expression for chip thickness ratio. Explain different types of chips observed in metal cutting with neat diagrams.

OR

3 (a) Show schematically the Merchant's force circle. Derive the expression for shear force in terms of the material properties and cutting process parameters.
(b) What are essential characteristics of cutting fluid?

UNIT – II

4 (a) What are the chief distinguishing features of a turret lathe as compared to an engine lathe?
(b) Discuss with neat sketches the important accessories used on lathe machine.

OR

5 (a) Derive taper angle equation & explain taper turning method by special attachment.
(b) What are the various types of automatic lathes in the single spindle category?

UNIT – III

6 (a) Draw and show the various elements of a twist drill. Explain.
(b) List the differences between counter boring, counter sinking and spot facing.

OR

7 (a) Describe the operation of a quick return motion mechanism in a mechanical shaper.
(b) Enumerate the differences between shaper, slotting and planner.

UNIT – IV

8 (a) Describe schematic diagram of universal milling machine.
(b) List the various types of milling cutters. With a neat sketch explain cutter geometry.

OR

9 (a) How is grinding classified? Explain with a neat sketch a plane cylindrical grinder.
(b) State the merits and demerits of honing and give some applications of this process.

UNIT – V

10 (a) What do you mean by jigs and fixtures?
(b) What are the principles of design of jigs and fixtures?

OR

11 (a) Explain the principle of six point location.
(b) List the basic requirements of clamping devices and explain about quick acting clamps.

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