

Code: 13A03602

B.Tech III Year II Semester (R13) Regular & Supplementary Examinations May/June 2017

MACHINE TOOLS

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) Describe the types and characteristics of cutting fluids.
 - (b) Draw the Merchant's force diagram and show the cutting forces.
 - (c) Describe any two work holding devices used on the lathe.
 - (d) With a neat sketch, explain different methods of taper turning.
 - (e) Sketch a twist drill and mention different parts.
 - (f) How table reversal is obtained in a planar?
 - (g) What is indexing? Describe direct indexing.
 - (h) Compare grinding machine with lapping machine.
 - (i) Classify 3-2-1 jigs and fixtures in brief.
 - (j) Write the typical examples of jigs and fixtures.

PART – B

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

UNIT – I

- 2 (a) What are the various costs associated with machining operation. Explain in detail.
(b) For a given set of conditions, how would you arrive at the best cutting speed for maximum production? Explain in brief.

OR

- 3 (a) What are the various precautions that are to be associated while working in machine shop?
(b) Write a short note on: (i) Machinability. (iii) Cutting tool materials. (iii) Feed and depth of cut.

UNIT – II

- 4 (a) Name the different types of the lathes available in machine shop? Describe the working of a centre lathe.
(b) Explain following parts of a lathe by neat sketches:
(i) Lathe Bed.
(ii) Carriage.
(iii) Headstock.
(iv) Tailstock.

OR

- 5 Briefly explain the following:
(a) Single spindle and multi spindle automatic lathes.
(b) Tool layout and cam design.

UNIT – III

- 6 With a neat sketch, explain the principle of working, specifications, types and operations performed on boring machine.

OR

- 7 (a) Differentiate shaper, planer and slotter.
(b) Explain the principle of quick return motion mechanism of a shaper. What is the need of this mechanism?

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UNIT – IV

- 8 (a) Sketch and describe the indexing head used for gear cutting.
(b) Explain the principle of differential indexing.
(c) How will you index the gear teeth? Sketch the indexing set-up showing necessary calculations.

OR

- 9 (a) With a neat sketch, explain construction and working of tool and cutter grinding machine.
(b) With a neat sketch, explain the constructional details of broaching machine.
(c) Compare lapping and honing machines.

UNIT – V

- 10 Explain the principle of working types of UBMTS and also describe their characterization and applications in detail.

OR

- 11 With a neat sketch, explain the following:
(a) Clamping and work holding devices.
(b) Multispindle heads.
(c) Unit built machine tools.

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