

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)

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- 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. (ii) 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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