

**R13**

Code No: 115EE

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, November/December - 2016****MACHINE TOOLS****(Common to ME, MCT, MSNT)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A****(25 Marks)**

- 1.a) What is the function of chip breaker? [2]
- b) Define the terms 'Cutting speed', 'feed' and 'depth of cut'? [3]
- c) What is an apron? [2]
- d) What are the attachments are used commonly on capstan and turret lathes? [3]
- e) What are the common work holding devices used in shaper? [2]
- f) Distinguish between Drilling and tapping? [3]
- g) What is honing? [2]
- h) Define Broaching? [3]
- i) Why a coolant used in grinding work? [2]
- j) What do you mean by dressing and truing in grinding wheel? [3]

**PART - B****(50 Marks)**

- 2) Draw a Merchants circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and different parameters involved in metal cutting. [10]

**OR**

- 3.a) Derive the expression for shear angle in orthogonal cutting in terms of rake angle and chip thickness ratio.
  - b) How is the chip formed in metal cutting? Explain the terms Shear plane and Shear Zone. [5+5]
  - 4.a) What machining operations can be performed on a center lathe?
  - b) How do you classify turret lathes? Give a brief description of the different types you know. [5+5]
- OR**
- 5.a) What is face plate? Where will you prefer its use and why?
  - b) Explain the construction and working principle of a lathe with neat sketch. [5+5]

- 6.a) Explain the working of a hydraulic quick return mechanism of a shaper. [5+5]  
b) Explain various operations performed in drilling machine. [5+5]

**OR**

- 7.a) Explain the working of a slotted disc mechanism for driving the ram of a slotter.  
b) Differentiate between shaping, planning and slotting, as regards relative tool and work motions. [5+5]

- 8.a) Describe in detail about honing tools.  
b) What is the principle of working of milling machines? How do you classify the milling machine? [5+5]

**OR**

- 9.a) Explain the difference between lapping and grinding.  
b) With the help of a line diagram, explain the constructional features of a universal milling machine. [5+5]

- 10.a) How the grinding wheel is selected for a particular job?  
b) Which materials are used in the manufacture of grinding wheels? What properties they impart to the wheel? [5+5]

**OR**

- 11.a) What are common devices used for dressing of grinding wheels? Describe in brief.  
b) What are the advantages and disadvantages of the different bonds used in grinding wheel? [5+5]

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