

R13

Code No: 115EE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2017

MACHINE TOOLS

(Common to MSNT, ME, MCT)

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) Describe the basic elements of machining. [2]
- b) How does a build up edge is formed? Explain its effects. [3]
- c) What is a Lathe what are the types of Lathe. [2]
- d) List out various types of Lathe attachment explain any one. [3]
- e) Classify different types of Drilling machines. [2]
- f) Explain the working principle of slotter. [3]
- g) Explain the principle of milling machine. [2]
- h) Write about various advantage and limitations of honing and lapping. [3]
- i) How are abrasives selected for grinding operation? [2]
- j) Compare and contrast grinding, lapping and honing. [3]

PART - B**(50 Marks)**

- 2.a) Derive the expression for chip thickness ratio.
- b) Determine the cutting speed and machining time per cut when the work piece having 45 mm diameter is rotating at 400 rpm. The feed given as 0.15 mm/rev and length of cut 6cm. [5+5]

OR

- 3.a) In orthogonal cutting of mild steel component, if the rake angle of the cutting tool is 12° and the shear angle is 42° . Find the chip thickness ratio.
- b) What are the desirable Characteristics of cutting material? Describe them in brief. [5+5]
- 4.a) Draw the tool layout of Hexagonal head bolt.
- b) Diagrammatically explain the thread cutting on the lathe machine. [5+5]

OR

- 5.a) How lathe is specified explain briefly the operations that are performed on a lathe.
- b) Explain what is meant by a Taper. Discuss in detail the taper turning by compound rest swelling method? [5+5]

- 6.a) Describe the operation of quick return motion in mechanical Shaper.
b) Find the machining time required for machining the surface 600×800 mm, on a shaping machine. Assume, cutting speed as 8 m/min. The return to cutting time ratio is 1:4, and the feed is 2 mm/ stroke. The approach and overrun at each end is 70 mm. [5+5]

OR

- 7.a) With the help of neat sketch explain the radial drilling machine.
b) Estimate the time required to drill a hole on a wider face of a give workpiece of size $2m \times 1m \times 50mm$. Assuming the cutting angle as 230 degrees, approach and overrun be 30 mm each, cutting velocity 52m/min, feed be 2mm/stroke and clearance on both side be 20mm. [5+5]

- 8.a) Differentiate between up milling and down milling and explain their applications.
b) Explain in detail various operations performed on milling machine. [5+5]

OR

- 9.a) Explain the procedure for simple indexing with an example.
b) With the help of neat sketch explain the geometry of milling cutter. [5+5]

- 10.a) What are surface grinding machine, explain various surface grinding machines.
b) Describe grinding wheel structure with a neat sketch. [5+5]

OR

- 11.a) What are special types of grinding machine explain two in detail.
b) What is meant by centerless grinding? State its advantages and limitation of it. [5+5]

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