Code No: 115EE

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech III Year I Semester Examinations, February/March - 2016

MACHINE TOOLS

(Common to 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.

Illustrate your answers with NEAT sketches wherever necessary

Part- A

(25 Marks)

1.a) How are the Cutting tools classified according to the number of major cutting edges (points) involved? [2]

b) What is Built – up edge, and how is it formed? Explain briefly. [3]

c) List the advantages of various Taper Turning Methods on Engine Lathe. [2]

d) What is a Multiple spindle Vertical Turret lathe? What are its characteristics? [3]

e) How is cutting angular surfaces done on a shaper? [2]

f) How is the chip – clogging problem in Deep hole drilling machines solved? [3]

g) Distinguish between lapping and honing operations. [2]

h) What are the various accessories to milling machines? Explain the use of any one of them. [3]

i) Why is dressing of a grinding wheel necessary? [2]

j) Explain the effect of grain size and bond on the performance of a grinding wheel. [3]

Part-B

(50 Marks)

2. How do you express the tool geometry in the following systems?
a) ASA system b) ORS system [5+5]

OR

3.a) Explain the mechanics of chip formation in turning with single point cutting tool.

b) Distinguish between Continuous chips and Discontinuous chips, and explain the situations where each of them is formed. [5+5]

4. Draw a sketch of the line diagram of capstan lathe, and describe the differences in between capstan and turret lathes. [10]

OR

5. Distinguish between the features and applications of Single spindle automatic lathes and Multi – spindle automatic lathes, with relevant schematic diagrams. [10]

6.a) How do you calculate the machining time for (i) Longitudinal turning, (ii) Drilling operation, and (iii) Milling operation? Explain.

b) Draw the Kinematics scheme of a boring machine. [5+5]

OR

7.a) Distinguish between the operating principles of Fine boring machines and Vertical Jig boring machine.

b) Explain the principle of working and applications of a Planing machine. [5+5]

8.a) Distinguish between the principal features of vertical and universal milling machines.

b) Explain the principle of operation and applications of Broaching machines. [5+5]

OR

9.a) Explain the following methods of indexing used in Milling machines :

(i) Compound indexing (ii) Differential indexing.

b) Index for 87 divisions, using the method of Compound indexing. [5+5]

10.a) What are the special features of grinding process? Explain.

b) What are the different types of grinding wheel wear? Explain with a suitable sketch. [5+5]

OR

11.a) Describe, with a neat sketch, the Kinematic Scheme of a Surface grinding machine.

b) Explain different types of abrasives used in making a grinding wheel. [5+5]

---oo0oo---