

Code No: 55018

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

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

MACHINE TOOLS

(Common to ME, MSNT)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

Illustrate your answer with NEAT sketches wherever necessary

- 1.a) Explain the mechanics of chip formation and types of chips in orthogonal cutting.
- b) Draw the Merchant's Force diagram, and explain its use. [8+7]
- 2.a) Distinguish between Turret and Capstan lathes, and explain the applications wherein each type is best suited.
- b) How much machining time will be required to reduce the diameter of a cast iron rod from 120 mm to 116 mm over a length of 100 mm by turning using a carbide insert? Reasonably select values of the cutting speed and tool feed (mm/rev). [8+7]
- 3.a) Draw the kinematic diagram of a Slotting machine, and explain the kinematic principle of the mechanism.
- b) Explain how you would estimate the machining time in shaping and planning operations. [8+7]
- 4.a) Explain, with a suitable sketch, the Kinematic System of general purpose drilling machines.
- b) Determine the time that will be required to drill a blind hole of diameter 25 mm and depth 40 mm in a mild steel solid block by a HSS drill of 118° cone angle. Assume suitable values of the cutting speed and tool feed (mm/rev). [8+7]
- 5.a) Describe, with suitable sketches, the types and geometry of milling cutters.
- b) Explain the different methods of indexing used in milling machines. [8+7]
- 6.a) Explain the different parameters involved in the specification of a grinding wheel. How do you select a grinding wheel for (i) Rough grinding, and (ii) Finish grinding?
- b) What are special types of grinding machines, and where are they used? [8+7]
- 7.a) With a neat sketch, explain the different parts of a broaching tool. Also distinguish between push type broach and pull type broach.
- b) Compare the lapping and honing processes with grinding. [8+7]
- 8.a) Describe, with a neat sketch, the constructional features of a Boring Fixture.
- b) Explain the principles of clamping used in the design of clamps. [8+7]