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.
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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