R15

Code No: 125EE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2018
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) Write a short note on cutting fluids. [2]
b) What are the requirements for the cutting tool material? [3]
c) How do you classify automatic machines? [2]
d) How do you specify the lathe machine? [3]
e) Give the specification of slotter machine. [2]
f) Calculate the time taken in seconds for a high-speed steel drill 10mm diameter to penetrate a 18mm thick steel plate. Assume a feed of 0.2mm/rev for the 12mm size drill and cutting speed for steel as 20m/min. [3]
g) Calculate the machining time required for broaching a square hole in a hub. The effective length of the broach is 400mm and the cutting speed is 2.5m/min. [2]
h) Compare up-cut and down-cut milling process with particular reference to chip formation and forces induced in component and cutter. [3]
i) Describe the Indian standard method of specifying a grinding wheel by taking a concrete example. [2]
j) What is wheel glazing and loading of the grinding wheel? [3]

PART - B

(50 Marks)

2.a) During turning a mild steel component with an orthogonal tool a feed of 0.75mm/rev is used at 50 R.P.M. If the chip thickness is 1.5mm, determine the chip thickness ratio. Also find the length of chip removed in one minute, if the work diameter is 50mm before the cut is taken. Assume a continuous chip.
b) Explain merchant's force diagram with proper sketches and equations. [5+5]

OR

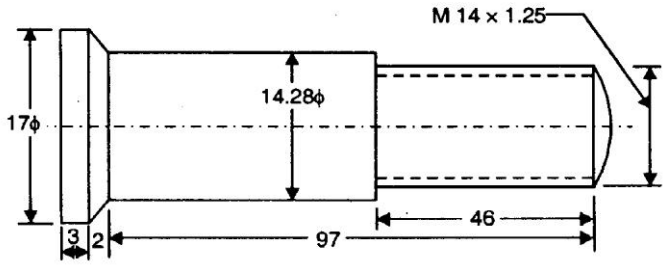
3.a) If shear strength=6000kg/cm^2, width of cut=10mm, cutting speed=30m/min, coefficient =0.9. Determine the shearing force, friction angle, cutting force and horse power at the cutting tool.
b) Differentiate between orthogonal and oblique cutting methods. [5+5]

4.a) Describe some of the equipment used for holding work on a lathe, with suitable sketches.
b) What is the difference between capstan lathe and Turret lathe? Explain with the help of neat sketches. [5+5]

OR

5.a) Draw neatly the tool layout for turret automatic lathe machine.

b) Draw the tool lay out for the component shown in the figure. And mention the sequence of operations performed on it. All dimensions are in mm. [5+5]



6.a) Explain in detail the operations performed on shaper with suitable sketches.

b) What is a jig-boring machine? Describe its construction and working in detail with a neat sketch. [5+5]

OR

7.a) Explain in detail the Quick return mechanism of ram in shaper with neat sketch.

b) Explain the kinematic mechanism of Drilling machine with neat sketches. [5+5]

8.a) Explain the principle parts of column and knee type milling machine.

b) Compare and contrast among lapping, honing and broaching. [5+5]

OR

9.a) Explain the geometry of milling cutters.

b) Explain the kinematic features of broaching machine. [5+5]

10.a) Sketch and explain three methods of cylindrical grinding.

b) Explain in detail some of the special grinding machines. [5+5]

OR

11.a) Explain in detail about Tool and cutter grinders.

b) What are the various factors to be considered in selection of grinding wheel? Discuss each in detail. [5+5]

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