

4E4142

Roll No. \_\_\_\_\_

Total No of Pages: 3

4E4142

B. Tech. IV Sem. (Main/Back) Exam., June/July-2014

Mechanical Engg.

4ME3A Machining & Machine Tools

Common with AE

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:-

Attempt any **five** questions, selecting **one** question from each unit. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. \_\_\_\_\_ 2. \_\_\_\_\_

### UNIT – I

- Q.1 (a) Explain geometry of single point cutting tool with neat sketches. [8]
- (b) Differentiate between orthogonal and oblique cutting. [4]
- (c) Discuss factors responsible for production of various types of chips. [4]

OR

- Q.1 (a) What is the effect of high cutting temperature on tool and workpiece? Explain how chip-tool interface temperature can be measured. [4+4=8]

(b) Prove that shear strain

[8]

$$\gamma \Rightarrow \cot \phi + \tan (\phi - \alpha)$$

Where  $\phi \Rightarrow$  shear angle &

$\alpha \Rightarrow$  rake angle

## UNIT - II

Q.2 (a) Discuss various factors affecting machinability in detail.

[8]

(b) Explain various mechanism of tool wear.

[5]

(c) Name different types of tool material.

[3]

OR

Q.2 (a) The Taylor tool life equation for machining C-40 steel with a 18:4:1 H.S.S. cutting tool at a feed of 0.2mm/min and a depth of cut of 2mm is given by  $VT^n=C$ , where n & C are constants. The following V and T observation have been noted

$V_1$  m/min      25      35

$V_2$  m/min      90      20

Calculate

(i) n and c

(ii) Hence recommend the cutting speed for a desired tool life of 60 min. [8]

(b) What is function of cutting fluid during machining? Discuss various types of cutting fluids.

[2+6=8]

### UNIT – III

- Q.3 (a) Explain any one quick return mechanism of a shaping machine. [8]  
(b) Explain working of a cylindrical grinding machine. [8]

OR

- Q.3 (a) Differentiate between a capstan and a turret lathe machine with suitable sketches. [8]  
(b) Explain tracer attachment in machine tools. [8]

### UNIT – IV

- Q.4 (a) Discuss various types of abrasives used for grinding. [8]  
(b) Explain process of manufacturing of a grinding wheel. Why harder wheel is used for soft material and softer wheel for hard material? [5+3=8]

OR

- Q.4 (a) Explain Honing operation and its applications. [8]  
(b) Explain thread milling and thread grinding operations. [8]

### UNIT – V

- Q.5 (a) Explain gear shaping process. What are its advantages and limitations? [8]  
(b) Discuss various gear finishing processes. [8]

OR

- Q.5 Explain any two methods. [16]  
(a) Hydraulic forming  
(b) Explosive forming  
(c) Magnetic pulse forming.