

**6E3051**

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

Total No of Pages: **4****6E3051****B. Tech. VI Sem. (Main & Back) Exam., May-2014  
Mechanical Engineering  
6ME3 Manufacturing Science & Technology****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 may suitably be assumed and stated clearly.*

*Units of quantities used/ calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

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

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

**UNIT-I**

Q.1. (a) What are the differences between jigs and fixtures? Write the different design considerations used for designing jigs and fixtures. [8]

(b) Explain various types of milling fixtures and jig bushes with their merits, demerits. [8]

**OR**

- Q.1. (a) What do you understand by the principle of locating and clamping devices?  
What is the six points location principle? Explain. [8]
- (b) What do you understand by economics of jigs and fixtures? Explain various types of welding and assembly fixtures. [8]

**UNIT-II**

- Q.2. (a) How the electrons are generated in electron beam machining? What is the working principle of electron beam machining? [8]
- (b) What are the differences between conventional and unconventional machining methods? Explain abrasive jet machining. [8]

**OR**

- Q.2. (a) What is the working principle of plasma arc machining? What are its merits and demerits? [8]
- (b) Explain electro discharge machining with its advantages, disadvantages and applications. [8]

**UNIT-III**

- Q.3. (a) Explain the various elements of surface roughness. Discuss various methods of evaluating the surface roughness in brief. [8]

- (b) Explain various terms used for measurement of gear tooth profile. Explain the method for measuring the gear tooth thickness. [8]

**OR**

- Q.3. (a) List various types of comparators. Explain the working principle of pneumatic comparator with its advantages and disadvantages. [8]

- (b) How the slope of an object can be measured with the help of sine bar and slip gauges? Explain with a neat sketch. [8]

### **UNIT-IV**

- Q.4. (a) How a single point cutting tool is designated? What is the role of each cutting tool angle in cutting operation? [8]

- (b) What do you understand by tool life? Explain the term optimum value of tool angles for cutting of mild steel. [8]

**OR**

- Q.4. (a) Explain the various parts and cutting angles of a twist drill. How do these angles affect the cutting operation? [8]

- (b) Derive the force and power consumption relationship during milling operation. [8]

## UNIT-V

Q.5. Write short notes on any **four** of the following:

[4×4=16]

- (a) Design of a lathe bed.
  - (b) Various lathe bed section and their utility
  - (c) Material and construction of lathe bed and guide ways
  - (d) Use of reinforcing stiffener in lathe bed
  - (e) Antifriction guide ways
  - (f) Design procedure of guide ways
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