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Code No: ME1523

GEC-R14

III B. Tech I Semester Supplementary Examinations, July 2017

## METAL CUTTING AND MACHINE TOOLS

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 60

**Note:** All Questions from **PART-A** are to be answered at one place.

Answer any **FOUR** questions from **PART-B**. All Questions carry equal Marks.

### PART-A

6 × 2 = 12M

1. List out the basic parts of a single point cutting tool.
2. What is the importance of centering in Lathe operations.
3. What are the different mechanisms used to convert rotary motion into linear motion.
4. List out the different operations performed on drilling machine.
5. Differentiate "UP" and "DOWN" Milling.
6. What are functions of Jigs and Fixtures?

### PART-B

4 × 12 = 48M

1. a) Define three speeds in cutting and derive relation between them. (6M)  
b) The tool life was decreased by 20% when the cutting speed increased by 45%. What is the percentage of decrease in tool life if cutting speed is increased by 60%. (6M)
2. a) Differentiate between Turret Lathe and Engine Lathe. (6M)  
b) Explain different accessories used in Lathe. (6M)
3. a) Classify planing machines and explain importance of each machine. (6M)  
b) Explain crank and slotted link mechanism used in shaper with a neat sketch. (6M)
4. a) Classify Drilling machines and explain importance of each. (6M)  
b) Calculate the time required for drilling a hole of diameter 10mm in a plate of 15mm thick. Cutting conditions are  
i) speed=45m/min,  
ii) feed=0.5mm/rev. Approach and over travel are 1.5mm each. (6M)

5. a) Explain different operations in Milling Machine with neat sketches. (6M)  
b) With neat sketch explain the Geometry of a plain milling cutter. (6M)
6. a) Explain each of the specifications of a grinding wheel along with it's selection. (6M)  
b) Explain the design principles of Jigs and fixtures. (6M)

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