

**III B. Tech I Semester Supplementary Examinations, May - 2019**  
**METAL CUTTING AND MACHINE TOOLS**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answer **ALL** the question in **Part-A**  
3. Answer any **FOUR** Questions from **Part-B**
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**PART – A**

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|---|----|--|------|
| 1 | a) | How is tool life defined? Explain the factors affecting tool life. | [2M] |
|   | b) | What special tooling is associated with the turret lathe?          | [2M] |
|   | c) | State the functions of clapper box in shaper.                      | [2M] |
|   | d) | Explain Straddle milling with a neat sketch.                       | [3M] |
|   | e) | What are the functions of a grinding fluid? Explain.               | [3M] |
|   | f) | Explain the working principle of CNC machine tool.                 | [2M] |

**PART – B**

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|---|----|--|------|
| 2 | a) | A carbide-cutting tool lasted for 150 min while machining M.S at 35 m/min. If a similar tool is used at 30% higher speed to machine M.S. Calculate the tool life. Also calculate the value of cutting speed if the tool is to machine for 2 hours. Assume $n=0.3$ in Taylors tool life equation $VT^n = C$ . | [7M] |
|   | b) | What do you mean by Positive rake angle and Negative rake angle? Explain their merits and demerits.  | [7M] |
| 3 | a) | Explain the different types of tool post with neat sketches.   | [7M] |
|   | b) | Draw a neat sketch of taper turning by taper turning attachment method.  | [7M] |
| 4 | a) | Differentiate between shaping, planning and slotting machines.   | [7M] |
|   | b) | Sketch a few work holding devices used in drilling machine.  | [7M] |
| 5 | a) | What are the fundamental differences in structure of a column type milling machine and knee type milling machine.  | [7M] |
|   | b) | Explain the following milling operations:<br>i) Straddle milling      ii) Gang milling   | [7M] |
| 6 | a) | Explain briefly the lapping process. Give the examples of lapping work.  | [7M] |
|   | b) | Describe the working principle of surface grinding.  | [7M] |
| 7 | a) | Discuss the types of motion controls in CNC machines.  | [7M] |
|   | b) | List the basic requirements of clamping devices and explain quick acting clamps.   | [7M] |

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