

Code No: R1631032

**R16****SET - 1****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****PART – A**

- 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**

- 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, planing 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: [7M]
  - i) Straddle milling
  - ii) Gang milling
- 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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