

Code No: 155CE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, September - 2021****METROLOGY AND MACHINE TOOLS****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1. 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 $VT^n = C$. [15]
- 2.a) How is tool life defined? Explain the factors affecting tool life.
b) What are the factors influencing in selection of cutting speeds and feeds for machining operation? [7+8]
- 3.a) Give the comparison between drilling and boring machining processes.
b) Sketch the work holding devices used in drilling machine and explain the functions. [7+8]
4. Differentiate between shaping, planning and slotting machines based on the operations. [15]
- 5.a) Explain the Straddle milling and Gang milling operations.
b) What are the types of Fits? Explain them with suitable examples. [8+7]
- 6.a) What is surface grinding? Explain the working principle of surface grinder.
b) Explain in detail about centerless grinding process. [7+8]
7. With reference to the metrology, define and distinguish between the terms.
a) Precision and Accuracy
b) Repeatability and Reproducibility
c) Nominal size and allowance
d) Tolerance limits and Control limits. [15]
- 8.a) Discuss various applications of Coordinate Measuring Machine (CMM).
b) What are different methods used for tool alignment test? Explain them. [8+7]

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