

Code: ME5T2

**III B.Tech - I Semester – Regular/Supplementary Examinations
October 2019**

**METAL CUTTING AND MACHINE TOOLS
(MECHANICAL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) What are chip breakers? Sketch any one of them.
- b) Name any five cutting tool materials.
- c) How do you specify a lathe?
- d) What do you understand by turret tool holder?
- e) What are various operations performed on a shaper?
- f) How do you specify a planer?
- g) What are various work holding devices used in drilling?
- h) How do you specify a portable drilling machine?
- i) List various types of milling machines.
- j) What are various tool holding devices used in milling?
- k) What is indexing?

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Write the differences between orthogonal cutting and oblique cutting processes. 8 M
- b) Using Taylor's equation, taking $n = 0.5$ and $C = 400$, Calculate the percentage increase in tool life, when cutting speed is reduced by 50%. 8 M
3. a) Sketch a neat diagram of an engine lathe showing all the parts and label the parts. 8 M
- b) Determine the angle at which the compound rest has to be swiveled while performing taper turning operation for the following dimensions: 8 M
- Large diameter = 80 mm
Small diameter = 40 mm
Length of the taper = 80 mm.
4. a) Explain the differences between planer and shaper? 5 M
- b) Sketch a neat diagram of a slotter showing all the parts and label the parts. Also explain its working principle. 6 M
- c) What is a clapper box? Draw the neat sketch. 5 M

5. a) Sketch a neat diagram of a radial drilling machine showing all the parts and label the parts. Also explain how it works and give its specifications. 8 M
- b) What are various types of boring machines? 3 M
- c) Sketch a horizontal boring machine, showing all the parts and label them. 5 M
6. a) Sketch and explain the Up milling and Down milling processes. 6 M
- b) Sketch a horizontal milling machine, label the parts, explain its working principle and give its applications. 10 M