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**B. E. (Seventh Semester) Examination,
April-May 2021**

(New Scheme)

(Mech. & Production Engg. Branch)

MACHINE TOOL TECHNOLOGY

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : All questions are compulsory. Part (a) of each question is compulsory. Answer any two parts from (b), (c) and (d). Draw neat sketches and label it wherever necessary. Part (a) carry 2 marks & rest of carries 7 marks.

Unit-I

1. (a) Define chip breakers?
(b) Explain merchant circle theory & stress & strain in

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chip with neat sketch.

- (c) A bar of 75 mm diameters is reduced to 73 mm by a cutting tool while cutting orthogonally. If the mean length of the cut chip is 73.5 mm. Find the cutting ratio. If the rake angle is 15° . What is the shear angle?
- (d) During orthogonal machining with rake angle 10° rake tool, with depth of cut = 2 mm and feed rate of 0.20 mm/rev. The cutting speed is 200 m/min. The chip thickness ratio is 0.31. The vertical cutting force is 1200 N and horizontal cutting force is 650 N. Calculate from the merchants theory, the various work done in metal cutting and shear stress.

Unit-II

2. (a) Define machinability Index?
- (b) Explain tool life and tool life equations?
- (c) Explain types & functions of cutting fluids?
- (d) Explain tool wear mechanism and factors affecting machinability?

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Unit-III

3. (a) What are the essential requirements of a machine tool design.
- (b) Explain analysis of force under Headstock, tail stock and saddle of lathe?
- (c) Explain Antifriction guide ways with sketch?
- (d) Explain use of reinforcing stiffener in lathe bed?

Unit-IV

4. (a) Define machine tool drive.
- (b) Explain the kinematic advantages of geometric progression over others?
- (c) Write shortnotes on selecting maximum and minimum cutting speed.
- (d) What is ray diagram, deviation diagram in connection with speed gear box? Draw neat sketches.

Unit-V

5. (a) Name the elements of feed gear box?

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(b) Describe the machine Tool maintenance?

(c) Discuss the following :

(i) Feed gear box of meander, stype

(ii) Norton gear box

(d) Explain briefly about the measuring equipments used for testing with neat sketches.