

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

Dec.-22-0185

ME-502 (Manufacturing Technology-II)

B.Tech. 5th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt one question from each Section A, B, C and D. Question no. 9 is compulsory. Any missing data may be assumed appropriately.

SECTION - A

1. Explain using a neat sketch what is meant by orthogonal and oblique cutting? How can these be realized in practice? (10)
2. In an orthogonal cutting test, the following data was obtained: uncut chip thickness = 0.1 mm, chip thickness ratio = 0.3 mm, chip width = 6.0 mm, cutting force = 1290 N, thrust force = 1650 N, rake angle = 10° . From Merchant's theory, calculate the various components of cutting forces and coefficient of friction at the chip tool interface. (10)

SECTION - B

3. (a) What are the desirable properties of a cutting tool material? (5)
- (b) Following is the data available on cutting speed and tool life: $V = 150$ m/min; $T = 60$ min and $V = 200$ m/min; $T = 23$ min. Determine the Taylor's constant and tool life exponent. (5)
4. (a) How is the milling cutter used for gear cutting and re-sharpening? (5)

2

ME-502

- (b) Briefly explain using schematic the gear generation methods. (5)

SECTION - C

5. Discuss the different parts that should form a
 - (a) Milling fixture
 - (b) Lathe fixture (10)
6. (a) Describe the working of a drill dynamometer. (5)
- (b) Around disk of 150 mm diameter is blanked from a strip of 3.2 mm, half hard cold rolled steel whose shear strength = 310 MPa. Assuming clearance allowance = 0.075, determine (a) the appropriate punch and die diameters, and (b) blanking force. (5)

SECTION - D

7. Sketch and explain the various types of centre-less grinding operations. Give the advantages and limitations of centre-less grinding. (10)
8. Using a neat sketch explain the principle of ultrasonic machining. Give advantages and applications. (10)

SECTION - E

9. (a) Define surface finish showing surface profile in turning.
- (b) Discuss the forms of tool life equations generally used with their applicability.
- (c) Discuss 3-divisional turning dynamometer.
- (d) Give the nomenclature of single point cutting tool.

[P.T.O.]

- (e) What is an equalizer?
- (f) What are the types of dies used in sheet-metal operations?
- (g) Differentiate using a sketch between jig and fixture.
- (h) Define glazing and dressing in grinding wheels.
- (i) Explain using a labeled sketch the principle of electrochemical machining.
- (j) Explain the marking system for conventional grinding wheel as per ANSI?
(2×10=20)