

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2125)

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B. Tech 5th Semester Examination
Manufacturing Technology-II (OS)
ME-5005

Time : 3 Hours

Max. Marks : 100

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 five questions in all, selecting one question from each section A, B, C and D. Section E is compulsory. Use of non-programmable calculator is allowed.

SECTION - A

1. (a) Explain the cutting forces in orthogonal cuttings merchant circle. Draw the diagram for cutting forces.
(b) During the orthogonal cutting, the following data were recorded:

Back rake angle=25 deg,	Chip thickness=0.15 mm/rev
Height of chip=40 mm.	Length of chip=100 mm
Width of chip before cut=3.5 mm.	Coefficient of friction=0.75
Cutting speed=250 m/mm.	Average shear stress=250 N/mm

Determine power consumption. (12+8=20)
2. (a) What is chip breaker? Describe various forms with neat sketch.
(b) Explain Merchant theory for shear plane angle in orthogonal cutting. (10+10=20)

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SECTION - B

3. (a) Derive the expression for shear angle in orthogonal cutting in terms of rake angle and chip thickness ratio.
(b) What are the standard angles of cutting tool? Illustrate with an example. (12+8=20)
4. (a) Explain the effect of various parameters on temperature developed during machining.
(b) Explain the various methods of measuring cutting temperature in metal cutting. (12+8=20)

SECTION - C

5. (a) Explain the gear cutting by a formed tool.
(b) Explain the different gear finishing processes.
(c) Explain the gear shaving, gear honing and gear lapping processes. (6+6+8=20)
6. (a) Describe about the gear finishing operations.
(b) Explain the selection of gear cutter for cutting helical or spiral gears. (10+10=20)

SECTION - D

7. (a) What is the principle of laser beam machining (L.B.M.)? State its limitations.
(b) State the advantages and disadvantages of laser beam machining processes over other unconventional machining processes. (10+10=20)
8. (a) Discuss the mechanism of material removal in EDM process.
(b) What are the different ways of gap-flushing used in EDM? (10+10=20)

SECTION - E

9. Short answer type questions

- (i) What is tool signature?
- (ii) What is clearance angle? And mention its types.
- (iii) Name the factors that contribute to poor surface finish in cutting.
- (iv) What are the four important characteristics of materials used for cutting tools?
- (v) Name the various cutting tool materials.
- (vi) What are the different methods of cutting force measurement?
- (vii) What is the effect of rake angle, nose radius provided on cutting tool?
- (viii) Why undercutting occurs in the gear teeth? How can it be prevented?
- (ix) What do you understand by locating devices?
- (x) Differentiate between gear forming and generating.

(10×2=20)