

- (c) Why truing and dressing are necessary in grinding wheels ?
- (d) Give the advantages and limitations of honing process.
- (e) What is Machineability Index ?
- (f) Why has EDM become so widely used ?
- (g) List the advantages of water jet machining.
- (h) Can contoured cavities be machined chemically ?

- (i) What type of workpiece is not suitable for laser beam machining ?
- (j) Why is electron beam machining hazardous ?

1.5×10=15

Roll No.

Total Pages : 04

J-21-0020

B. Tech. EXAMINATION, 2021

Semester V (CBCS)

MANUFACTURING TECHNOLOGY-II

ME-502

Time : 2 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D.
Q. No. 9 is compulsory.

Section A

1. Derive expressions for the cutting ratio. Also draw Merchant's Circle Diagram and show forces and angles acting on the cutting tool and different parameters involved in metal cutting. **15**

2. While machining steel with zero rake angle prove the following expression, where 'r' is chip reduction coefficient, P_c is specific cutting power and τ_s is shear strength of material : $\frac{\tau_s}{P_c} = \frac{r(1-\mu r)}{1+r^2}$. 15

Section B

3. (a) Discuss the different mechanisms of tool wear in machining. 8
 (b) During turning a mild steel rod, the tool life increased from 25 min to 50 min. when cutting velocity reduced from 100 m/min to 80 m/min. How much will be the life of tool if machined at 90 m/min ? 7
4. What are the detrimental effects of the high cutting temperature on the machined product and the cutting tool ? How can such cutting temperature be reduced without sacrificing productivity ? 15

Section C

5. (a) Outline the uses of jigs and fixtures in improving productivity. Also pinpoint the advantages of employing jigs and fixtures in mass production work. 8

- (b) What are the factors that influence the press size ? 7
6. (a) What operational factors must be considered to ensure efficient clamping of workpiece on jigs and fixtures ? 8
 (b) How is a press size designated ? 7

Section D

7. (a) Describe the Indian Standard's method of specifying a grinding wheel by taking a concrete example. 7.5
 (b) Compare grinding, honing and lapping operations. 7.5
8. Derive an equation for the maximum permissible feed rate during ECM. Also deduce the relationship for electrolyte temperature change for a given feed rate of tool. 15

(Compulsory Question)

9. (a) What is built-up-edge (BUE) ?
 (b) What are the conditions for using zero rake angle during metal cutting operation ?