Roll No. | | | | | | | | | | | | |

Total No. of Pages : 01

Total No. of Questions : 08

M.Tech.(PE) (Sem.–1)

METAL CUTTING

Subject Code : PE-502

Paper ID : [E0442]

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1. Explain with help of sketches the different systems of specifying tool geometry.

2. Determine the shear plane angle in orthogonal cutting and discuss the effect of rake angle, cutting speed, feed and depth of cut on shear plane angle.

3. Determine the temperature rise at the shear plane from the following experimental data in orthogonal cutting of mild steel of density 7.87 gm/cm^3 and specific heat of 0.44 J/gm taking that $\lambda = 1$.

   Force component in the direction of cutting velocity $F_h = 1600$ N

   Force component normal to the machined surface $F_v = 500$ N

   Depth of cut = 0.3 mm; Width of cut = 5; Chip thickness ratio = 0.42; Tool rake angle = 10°; Cutting velocity = 35 m/min

4. Enumerate the factors affecting tool life. Explain the effect of each factor.

5. What is machinability? Discuss the important machinability criteria.

6. Discuss in detail the mechanics of grinding wheel wear.

7. Write short notes on :

   a) Honing process

   b) Lapping process

8. Discuss the variation of cost elements with cutting speed in a single cut, single pass machining operation.