

Institute of Engineering and Technology (IET-DAVV) Indore
III BE Regular (Mechanical Engineering)
MER6C2_Production Engineering-II Assignment

Last Date of Submission: 16 December 2019

Note: This ASSIGNMENT consists of five questions, each carrying equal marks. Attempt all questions. Attempt any two parts out of the three parts (a),(b) and (c) from each question. Draw neat sketches/diagrams and assume suitable data wherever necessary.

- Q:1** (a) Draw merchant force circle diagram indicating all the forces acting at the chip tool interface. Also write the relationships for all the forces.
- (b) For an orthogonal machining operation on mild steel, the results obtained are : uncut chip thickness $t_1 = 0.25\text{mm}$, chip thickness $t_2 = 0.75\text{mm}$, width of the workpiece under cutting $w = 2.5\text{mm}$, Rake angle $\alpha = 0^\circ$, Cutting Force $F_C = 950\text{N}$, Thrust Force $F_T = 475\text{N}$. Determine (i) the coefficient of friction between tool and the chip. (ii) shear force F_S acting along the shear plane.
- (c) Explain the phenomenon of heat generation during machining and the cutting tool temperature rise. Also draw a neat sketch showing the generation and distribution of heat and temperature rise during machining.
- Q:2** (a) Define the following terms related to metal working (i) Hot Working (ii) Cold Working (iii) Warm Working.
- (b) Write a short note on Rolling operation.
- (c) Write a short note on Deep Drawing operation.
- Q:3** (a) Explain the need for the development of unconventional machining processes.
- (b) Explain briefly the principle, process parameters and equipment used in Abrasive Jet Machining(AJM).
- (c) Explain briefly the principle, process parameters and equipment used in Ultrasonic Machining(USM).
- Q:4** (a) Give a brief description of the various methods for the evaluation of surface roughness.
- (b) Write the effect of the surface finish on the performance of machined parts.
- (c) Write short notes on the following (i) Conversion Coating (ii) Physical Vapour Deposition.
- Q:5** (a) List the advantages and limitations of powder metallurgy.
- (b) Discuss briefly the characteristics of the metal powders to be used as the starting material in powder metallurgy.
- (c) Write a short note on the Composites.