ASSIGNMENT-1 Theory of Metal Cutting

Theory

1. Give and describe types of tool materials.
2. Give and describe types of cutting fluids.
3. What is tool Terminology and explain tool designation.
4. Explain Mechanism of chip removal and derive an expression of shear angle.
5. What is merchant force circle diagram and derive expression for determine all forces.
6. What is orthogonal and oblique cutting?
7. What is tool wear and tool life.

Examples

1 All Class work tutorials

2 The following observations were made during orthogonal turning of a mild steel tubing of 60 mm diameter on a lathe.
(1) Cutting speed ……24 m/min
(2) Tool rake angle …….....32º
(3) Feed rate ……..0.12 mm/rev
(4) Tangential cutting force……3000N
(5) Feed force……..1200N
(6) Length of continuous chip in one revolution…96 mm
Determine: (i) Co-efficient of friction (ii) Shear plane angle (iii) Velocity of chip tool face (iv) Chip thickness

3 In orthogonal cutting, if the feed is 1.25 mm/rev and chip thickness after cutting is 2mm, determine the following.
1. Chip thickness ratio
2. Shear angle
The tool bit has a rake angle of 10º.
If shear strength = 600 N/mm2
Width of cut = 10 mm
Cutting speed = 30 m/min
Co-efficient of friction = 0.9
Determine,
a. Shear force
b. Friction angle
c. Cutting force
d. Horse power at the cutting tool

ASSIGNMENT – 2 Thermal Aspects in Machining

Theory

1. Write short note on sources of heat generation?
2. List temperature measuring technique of machining and explain any one of them.
3. Define Cutting fluid? Write application and function of cutting fluid.

ASSIGNMENT-3 Gear and Thread Manufacturing

Theory

1 Explain with neat sketch manufacturing of gear by Gear shaping using pinion type cutters. What are the advantages of this method?
2. Classify the generating process for gear cutting? Explain "Gear Hobbing" in detail.
3. Write short note on Gear finishing process.
4. Differentiate between gear forming and gear generating methods.
5. Discuss following thread manufacturing methods with neat sketch (i) Chasing (ii) Rolling (iii) Tapping.
6. State various thread manufacturing methods.

ASSIGNMENT - 4 Jigs and Fixture

Theory

1. Give the definition about jigs and fixture and also give the difference for the same.
2. Explain types of locators with neat sketch.
3. Explain clamping device with neat sketch.
4. Explain types of various jigs.

ASSIGNMENT – 5 Press Tool

Theory

1. Draw neat schematic diagram of sectioned view of blanking die and punch assembly and also explain about clearance.
2. Give broad classification of die and explain each with neat sketch.
3. Describe methods of reducing cutting force in press tool design.
4. Draw the neat sketch of simple cutting die also list the various terminology and explain in brief.
5. Class work Tutorial (center of pressure, cutting force, clearance and strip layout)

Assignment – 6 Non-conventional Machining

Theory

1. Define Non-conventional machining? Why do we need these processes?
2. Give classification of the Non conventional processes?
3. Explain the working principle of EDM. What are the main process parameters? State advantage of EDM.
4. What is LASER? Explain LBM.
5. Explain with neat sketch working principle, advantages and limitations of USM.
6. Explain Abrasive Jet machining with schematic diagram stating its advantages and limitation.