



Unit – I

Short Answer Questions:

1. List the primary elements of metal cutting
2. Define tool life and write the Taylor's Tool life equation
3. List the any four types of chip breakers.
4. List any two differences between orthogonal cutting and oblique cutting.
5. List what are the different materials used for tools.

Essay Answer Questions:

1. What are the velocities which come in to existence when a metal is cut orthogonally?
Determine the mathematical relationship in terms of shear and rake angles.
2. a) Explain briefly about chip formation and the three types of chips.
b) Draw Merchants force diagram. State the assumptions made in the development of such a diagram.
3. Explain the effects of the following parameters on chip formation:
(i) Velocity (ii) Material of work piece (iii) Depth of cut (iv) Tool Geometry.
4. a) In an orthogonal cutting experiment with a tool of rake angle $=7^\circ$, the chip thickness was found to be 2.5mm when the uncut chip thickness was set to 1mm.
(i) Find the shear angle,
(ii) Find the friction angle assuming that merchant's formula holds good
b) A carbide-cutting tool lasted for 150 min while machining M.S at 35 m/min. If a similar tool is used at 30% higher speed to machine M.S. Calculate the tool life. Also calculate the value of cutting speed if the tool is to machine for 2 hours. Assume $n=0.3$ in Taylors tool life equation $VT^n = C$.
5. Explain the merchant's circle diagram and find the equations of stress, shear stress and strain.
6. a) What are the types of chips? Explain them.
b) Explain the factors influencing the tool life?

Unit – II

Short Answer Questions:

1. classify the different types of lathes.
2. List the specifications of a lathe.
3. List the operations performed on a shaper.

4. Explain the working principle of a slotter.
5. List out the drive mechanisms of a planar.

Essay Answer Questions:

1. Draw the neat diagram of engine lathe and describe the main parts and controls briefly.
2. a) Explain the thread cutting procedure on a lathe in detail
b) Describe briefly about the three taper turning methods?
3. a) Explain briefly the following lathe accessories:
(i) Driving Plate (ii) Lathe Centres.
b) Explain briefly the following operations with neat sketches:
(i) Knurling (ii) Forming.
4. a) Distinguish between a shaper, slotter and a planar?
b) Explain the principle of working of planar and explain its construction with a neat sketch?
5. a) Explain the working principle and construction of slotter with a neat sketch.
b) List the shaper driving mechanisms and explain anyone.
6. a) Explain the working principle and construction of Shaper with a neat sketch.
b) State the advantages, limitations and operations of shaper