



OBJECTIVES

- I. Understand the basic parameters in the metal cutting operation Appreciate different types of chips formed in metal cutting ,their relevance in manufacturing
- II. Calculate analytically the forces and other parameter associated with orthogonal cutting Understand tool wear and tool life and the variables that control them Know the various cutting fluids and their application methods
- III. Understand the importance of lathe, its many varieties and basic structure of centre lathe Choose various aids that are used to locate and support work pieces in a lathe.
- IV. Understand the various methods used to carry out the taper turning operations and thread cutting operations in a lathe .Utilize the capstan and turret lathe for different parts Understand different types of automatic lathe and their application methods. Understands operation of shaper, slotter and planer
- V. Understanding about drilling and grinding and basic structure and various aids that are used to hold and support the job.

S No	Question	Blooms Taxonomy Level	Course Outcomes
UNIT-I			
1	(a) Describe basic elements of machining. (b) Explain briefly mechanics of chip formation.	comprehension	1
2	(a) Explain the geometry of single point tool (b) Angles related to single point cutting tool. Explain the significance	knowledge	1
3	Explain briefly about formation of chip.	knowledge	1
4	Explain different types of chips formed while machining	comprehension	1
5	(a) How does a built up edge is formed (b) Explain its effect	knowledge	1
6	a) Explain the mechanics of orthogonal cutting b) How chip size vary from machining to non machining	comprehension	1
7	a) Draw merchant force diagram b) resolve the forces related to it	knowledge	1

8	Explain cutting speed, feed and depth of cut	knowledge	2
9	Give formula for cutting power in a metal cutting machine and explain about Material removal rate and Specific energy and its significance.	knowledge	2
10	(a) Discuss about tool life (b) What you mean by machinability	comprehension	1
11	a) what is a cutting fluid explain different type b) Explain about tool materials	comprehension	2
12	a) The tool signature is given as follows 6-6-5-10-5-5-0.8 label each in the diagram b) Explain ideal properties of cutting tool materials	applying	1,2
13	With respect to hot/red hardness list the cutting ability of following cutting tool materials a) Borazon b) Cermets c) Carbide d) Satellite e) HSS f) High Carbon Steel g) Low carbon steel	understanding	2
14	a. It is required to machine a shaft whose diameter is 80 mm with cutting speed of 50m/min determine i. Spindle speed in rpm ii. Feed in m/min iii. Depth of cut iv. MRR b. Establishment the relation between the Pz, Py, and Px and draw a virtual diagram	Problem solving	1
15	what is zero rake angle positive rake angle and negative rake angle explain diagrammaticall	comprehension	1,2
16	Explain different zones of heat generation	knowledge	1,2
17	Explain 2D and 3D machining	knowledge	1,2
18	In orthogonal cutting of mild steel component if the rake angle of the tool is 10° and shear angle is 30°. Find the chip thickness ratio	Problem solving	2
19	Determine the cutting speed and machining time per cut when the work having 35mm diameter is rotated at 200 rpm. The feed given is 0.2mm/rev and length of cut is 60mm	Problem solving	2
UNIT-II			
1	Explain the working principle of lathe	comprehension	2
2	What is a lathe what are the types of lathe	analysis	1
3	Explain about work holding devices and tool holding devices	comprehension	1
4	Explain the process of taper turning	comprehension	2
5	a) Explain diagrammatically the thread cutting on lath, b) Explain relation between pitch on lead screw and pitch on the work piece, RPM and number of teeth on spindle gear and lead screw gear	comprehension	1,2,3
6	Calculate suitable Gear Train to produce 4 mm pitch on work piece by using of 11 mm pitch lead screw.	analysis	2
7	List out various lathe attachments	knowledge	2
8	Explain about principle feature of automatic lathe	comprehension	1
9	Comparison between a turret and capstan	comprehension	3

10	Explain the difference between single spindle and multi spindle lathe	knowledge	1
11	What are different operations performed on lathe explain briefly	comprehension	2
12	In a HSS tool 18-4-1 in the chemical composition explain each chemical constituent and effect on properties	applying	1,2
13	Write the tool layout for hexagonal head bolt	applying	2
14	Explain about bar feeding and work stoppers Explain about collet arrangement for work holding device	applying	1,3
UNIT-III			
1	Explain the working principle of shaping and types of shaper	comprehension	2
2	Explain the working principle of slotting and operations performed on it	analysis	1
3	Explain the principle of planner and types of planner machine	comprehension	2
4	Describe the operation of quick return motion in mechanical shaper	comprehension	2
5	Write the difference between shaping and planning machine	comprehension	1
6	a. Explain the types of drilling machine that are used in machine shop b. state the working principle of drilling machine	knowledge	3
7	What are the different types of drills used explain the function of each of the drill type	comprehension	1
8	What do u mean by boring and types of boring machine	comprehension	2
9	Show with neat sketch a twist drill and label the important features	knowledge	1
10	What are the work holding device of boring and drilling machine	comprehension	3
11	Explain the cutting parameters in Shaping machine	comprehension	1
UNIT-IV			
1	Give a brief classification of milling machines and explain the principle of milling machine	analysis	3
2	What are the various types of milling cutters used in milling explain	knowledge	4
3	Differentiate between up milling and down milling explain their application	comprehension	4
4	What is difference between compound indexing and differential indexing	knowledge	1
5	What are the various work holding devices in milling explain their advantages	analysis	1,4
6	Explain briefly about lapping process and honing process	knowledge	2
7	Compare lapping and honing operations	comprehension	3
8	Specify the honing parameters for good honing process	comprehension	1,2
9	What do u mean by broaching explain principle related to broaching and types of broaching machines	knowledge	5
10	Give advantages and limitations of honing and lapping	comprehension	2
UNIT-V			
1	How is grinding different from other machining operations explain its applications in view of capabilities	analysis	5
2	Specify different grinding machines	knowledge	1
3	What are the different types of abrasives used in grinding wheel explain them	comprehension	2
4	How is abrasive is selected for grinding operation	knowledge	3

5	Mention various types of bonds used in making of grinding wheel also mention their application	analysis	5
6	Describe grinding wheel structure with a neat sketch	knowledge	5
7	Compare grinding honing and lapping	comprehension	5
8	What are the advantages and limitations of using centre less grinding	comprehension	5
9	Describe dressing and balancing in grinding requirement in grinding	knowledge	1,5
10	Briefly describe about tool and cutter grinding machine	comprehension	5