Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Mechanical Engineering
Assignment (MTT-020020503)

Unit-1 Introduction

1. What is depth of cut? Write down its SI unit.
2. Who is the person in-charge and coordinator of the activities of group of workers engaged in a particular task? Why?
3. Write down any four skills required in a supervisor.
4. Write down the equation to calculate cutting speed.
5. Write down any four attitude required in a supervisor.
6. What is 'Feed'? What is its SI unit?
7. Draw a neat sketch of geometry of milling cutter.
8. Which skills are required in a shop floor supervisor?
9. Draw a neat sketch of geometry of carbide inserts tool.
10. Explain the factors to be considered to reduce the machining cost.
11. Draw a neat sketch of single point cutting tool showing its geometry.
12. List out required skills of a shop floor supervisor.
13. What kind of attitude is required for the shop floor supervisor?
14. What are the scopes of machine tool technology in industries?
15. What do you understand by surface finish? Mention symbol & value of surface finish for different finishing operations.
16. Explain "metal removal rate" and state the factors to be considered to reduce the machining cost.
17. Explain the importance of machine tool technology in industries.
18. Explain the need of machine tool technology in industries.
19. Who is the vital link between management and workers? Why?
20. Explain the geometry of single point cutting tool with neat sketch.
21. List out major industries of Gujarat dealing with machine tools.
22. What is cutting speed? What is its unit?
23. What is metal removal rate? Explain with its equation.
24. What is machine tool?
25. Write down the equation to calculate MRR.
26. Define: Cutting speed.
27. What is surface finish? Write down the value of surface finish for different finishing operations.
28. What is the need of machine tool technology in industries?

Unit-2 Grinding and Super Finishing Processes

1. Name and sketch the different types of grinding wheels according to their shapes. (Any four)
2. What is grade of grinding wheel? How it is classified?
3. What is the function of grinding fluid?
4. Write short note on form grinding & profile grinding process.
5. Explain the designation of grinding wheel (1) “WW A 46 H 6 V XX” (2) “W A 54 E 5 B 17”
6. Classify types of bonding materials.
7. Write short note on centerless grinding process.
8. Explain honing process with neat sketch.
9. Explain the designation of grinding wheel (1) “W A 100 M 5 V 25” (2) “30 A 46 H 6 V XX”
10. Explain the purposes of Trueing and dressing of grinding wheel.
11. What is structure of a grinding wheel? How it is classified?
12. How organic bond is made for making a grinding wheel?
13. Explain the purposes of Trueing and dressing of grinding wheel.
14. Write short note on honing.
15. Differentiate between honing and lapping.
16. Explain the working principle of swing frame grinder with a neat sketch.
17. Explain centerless grinder in brief.
18. Explain cutting action and self-sharpening action of grinding wheel.
19. Write down advantages of grinding.
20. What is rough grinding? What are its uses?
21. Enlist the properties of abrasive grains.
22. Enlist the constant factors considered for selection of grinding wheels.
23. What is loading in grinding wheel? Write down causes for it.
24. What do you mean by grain size? How it is classified?
25. What is the function of diamond dresser?
26. Explain the term glazing.
27. Write down names of abrasive materials.
28. Classify types of bonding materials and explain mineral bond.
29. Write down disadvantages of grinding.
30. Explain cylindrical grinding operation.
31. Explain the designation of grinding wheel (1) “W C 80 M 8 V I7” (2) “W A 36 F 6 B 19”
32. Explain self-sharpening action of grinding wheel.
33. Write down drawbacks of grinding operation.
34. Explain any one surface grinding operation in brief.
35. Explain the designation of grinding wheel (1) “20 A 54 H 5 V XX” (2) “W C 180 W 9 S XX”

Unit-3 Gear Manufacturing and Finishing Processes

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Unit-4 Thread Production Methods

1. Classify various methods of gear manufacturing.
2. Classify gear manufacturing processes.
3. Explain gear hobbing process with neat sketch.
4. Compare gear hobbing and gear shaping process.
5. Explain thread rolling process with sketch.
6. Write short note on gear grinding process.
7. Compare gear milling and gear broaching process.
8. State gear finishing methods and explain any one method.
9. Explain the thread milling process with neat sketch and give its application.
10. Explain with neat sketch the thread production process on a lathe machine.
11. Explain gear milling process with its advantages & disadvantages.
12. State at least four advantages of gear hobbing process.
13. Enlist the name of different types of gears.
14. Write down any four characteristics of gear forming process.
15. What are the advantages of thread rolling process?
16. Write advantages and limitations of gear broaching.
17. Write down applications of gear hobbing process.
18. What are the limitations of thread rolling process?
19. Explain die-threading process with neat sketch.
20. Write a short note on gear shaving process.
21. Define any three terminologies of a spur gear and draw a neat sketch
22. What are the disadvantages of thread rolling process?
23. List the different types of threads. Draw sketch of any one type of thread.
24. Name the gear finishing methods and state its objectives.
25. Explain working principle of gear shaping with neat sketch.
26. Draw the neat sketch of elements of thread. Define any three elements.
27. List various thread production methods and explain thread chasing with neat sketch.
28. Write short note on gear grinding process.
29. Explain thread rolling process with sketch.
30. Write down applications of gear shaping process.

Unit-5 Broaching, Jig Boring and Special Purpose Machine Tools

1. State the differences between pull broach and push broach.
2. Write down the function of front and rear pilot.
3. Explain push broaching method with neat sketch.
4. State working principle and applications of jig boring machines.
5. Explain special broaching machines.
6. Give types of broach based on construction and explain progressive broach.
7. Define jig boring machine. Draw a neat sketch of single column jig boring machine and label its parts.
8. Classify broach and explain its working principle with figure.
9. Explain with neat diagram working of horizontal broaching machine.
10. Describe surface broaching machine.
11. Write down the function of rough and semi-finish teeth.
12. List advantages and limitations of broaching.
13. Explain any two type of broach with neat sketch.
14. Give classification of broach in brief.
15. Classify broaching machines and explain any one?
16. List the types of broaches. Draw the neat sketch of external broach and show its elements.
17. Define machine tool. State the need of machine tools technology.
18. Classify the broach & write the application of broaching process.
19. Name different broaching machines. Sketch block diagram of any one and identify parts.
20. What is ‘surface broaching’ and ‘continuous broaching’?
21. What is broach? How it is classified?
22. List out different specifications involved in broaching machine.
23. State the difference between pull broach and push broach.
24. How do you specify a broaching machine size? Explain.
25. Explain progressive cut broaching.
26. Write down function and use of burnishing broach.
27. State the types of boring tools based their shapes. Draw sketch of special boring tool.
28. What are the benefits of broaching?
29. State the need of jig boring machines.
30. Explain uses of jig boring machine.
31. Explain working principle of broaching process.
32. State advantage and disadvantage of broaching process.
33. What are the functions of broaching fixtures?
34. List various methods of broaching.
35. Name the different work holding devices.
36. Why Automats are used in production? List advantages of Automats.
37. List the name of various special purpose machine tools.
38. List out the typical operations which can be performed on automatic lathes.
39. Write down types of collets.
40. Write advantages of turret lathe.
41. State the difference between capstan and turret lathe.

42. Write the difference between standard machine tools and special purpose machine tools.
43. Write a short note on swiss type automate with neat sketch.
44. Explain parallel action multi spindle automates with neat sketch.
45. Explain any one special purpose machine tools with its application.
46. Write down advantages and disadvantages of automates.
47. Write a short note on hydraulic copying lathe with neat sketch.
48. Explain Progressive action multi spindle automates with neat sketch.
49. Write down difference between horizontal and vertical broaching machine.
50. What is the use of nibbling machine?
51. What is the use of mechanical engraving machine?
52. List various semi-automatics lathes.
53. What is SPM? Also write its applications.
54. Write down uses of collets.
55. List various automatics lathes.
56. Is the productivity of multi-spindle machines higher compared to single spindle automatic lathes? Explain your answer.
57. What is the use of mechanical engraving machine?
58. Write a short note on Turret lathe.
59. Compare special purpose machine tools with other automates.
60. Write down advantages and limitations of collet.
61. Write down the construction of multi spindle lathe with neat sketch.
62. Write a short note on Progressive action multi spindle automates.
63. Explain benefits and limitations of automates.
64. Write a difference between special purpose machine tools with other automates.
65. Describe swiss type automate with neat sketch.
66. Explain the construction of multi spindle lathe with neat sketch.

Unit-6 Non-Conventional and Advance Methods of Machining

1. List out applications of abrasive jet machining.
2. Differentiate between NC and CNC machine.
3. Give disadvantage and application of Plasma Arc Machining (PAM) method.
4. Explain in brief about Plasma Arc machining.
5. State any four differences between EDM & ECM.
6. Write short note on Machining centre.
7. Enlist the limitations of conventional machining processes.
8. State the advantages and limitations of USM.
9. Classify and explain types of CNC machine tools based on method of machine control.
10. Explain working of PAM with neat sketch.
11. Explain absolute and incremental programming with example.
12. Explain any two G code used in CNC.
13. List and explain five G-code and M-code which are used in CNC machine.
14. Sketch and explain electrochemical machining process.
15. Sketch and explain electric discharge machining process.
16. Explain code G02 and G03 used for circular interpolation.
17. Explain Automatic Tool Changer with neat sketch.
18. Compare Conventional and Non-conventional methods of machining. Classify Non-conventional methods of machining.
19. Explain Abrasive Jet Machining with neat sketch.
20. Classify CNC Machine tools and explain any one.
21. Explain Manual Part Programming.
22. Write functions of dielectric liquid in EDM.
23. List applications of LBM.
24. Define: NC and CNC.
25. Write full form of NC and CNC.
26. State four desirable properties of electrolyte.
27. Define “Nozzle Tip Distance” in case of AJM.
28. Give various disadvantages of CNC machine.
29. What are CNC and DNC machine?
30. Which medium is used in the following non-conventional processes?
    - Abrasive Jet Machining
    - Ultrasonic Machining
    - Electrochemical Machining
    - Electric Discharge Machining
31. As per type of machine control classify various type of CNC machine tools.
32. Explain Direct Numerical Control machine (DNC) with two merits.
33. What is CAPP (Computer Aided Process Planning) in CNC?