Uka Tarsadia University (Diwaliba Polytechnic)
Diploma in Mechanical Engineering
Assignment (Tool Engineering -020020504)

Unit-1 Introduction

1. Define Tool
2. Define Tool Design
3. What is cutting tool?
4 Define trouble shooting in tool engineering.
5. List features of cutting tool.
6. List trouble shooting approaches used in tool engineering.
7. List different types of tools.
8. What is machine tool?
9. List different types of machine tools.
10. .Discuss concept and meaning of tool engineering.
11. List different terminologies used in tool engineering.
12. Name different application of cutting tool.
13. Give classification of tools.
14. Explain analytical approach used in tool engineering.
15. Briefly explain importance of tool engineering.
16. List advantages of tool engineering regarding cost.
17. Write short note on functions of tool engineering
18. What is the importance of tool engineering to enhance productivity and quality?
19. Discuss about different characteristics of tool engineer?
20. What is the importance of tool engineer in manufacturing firm?
21. List different duties and responsibilities of tool engineer?
22. Discuss about service and assistance of tool engineering in manufacturing unit?
23. Explain the trouble shooting approach used in tool engineering.
24. Write short note on organizational structure of tool engineering.
25. Discuss about intra and interrelationship in tool engineering organization.
26. Which are different trouble shooting approaches used in tool engineering?

27. Write short note on different methods used by tool engineering.

28. Discuss about common problems and troubles in tool engineering.

Unit-2

PROCESS PLANNING, ECONOMY AND ESTIMATION IN TOOL ENGINEERING

1. Define process planning
2. What is process charts?
3. What is CAPP?
4. What are the types of Estimation?
5. What is direct cost?
6. List the functions of estimating
7. What are the types of cost?
8. What is total cost?
9. What is meant by indirect material?
10. Define set up time.
11. Define machining time.
12. Define handling time.
13. Explain concept and meaning of process planning.
14. List different functions of process planning.
15. Name different forms used in process planning.
16. List information require for process planning.
17. Explain method to calculate machining time for turning operation.
18. Discuss method to calculate machining time for shaping operation.
19. List different information that we can receive from process sheet.
20. Classify different types of cost involves in tool engineering.
21. List steps involved in process planning.
22. List factors influencing tooling economy.
23. List various types of charts and diagrams used in process planning.
24. Explain types of estimates.
25. Explain meaning of safety in tool engineering environment.
26. What are the reasons for process documentation?
27. Explain the importance of process planning.
28. Discuss about each function of process planning.

29. State the concept and meaning of economy.
30. State the tooling principles leading to economy and list the factors influencing tooling economy.
31. List the rules of motion economy for removing unnecessary movements.
32. Briefly explain the economy of indirect cost.
33. Discuss the economy of direct cost.
34. Discuss universal acts and their elements of a manufacturing operation with simple example.
35. Discuss about different methods to calculate costs and ways to reduce it.
36. Prepare process sheet of piston of your own dimensions.
37. Prepare Process sheet of screw and nut assembly with any standard dimensions
38. Discuss importance of process sheet with suitable example and its effect on productivity.
39. Perform estimation of time and estimation of cost for product more than six operations.
40. Discuss safety concept and its importance for tool engineering environment.
41. Explain the process of estimation of material cost, labour cost and overheads with example.

Unit-3

INTRODUCTION TO TOOL DESIGN AND CUTTING TOOLS SELECTION

1. Define cutting tool.
2. Define machine tool.
3. List the different types of cutting tool materials.
4. State the application of high carbon steel.
5. Name the three groups of cemented carbides.
6. What is the full name of HSS?
7. What is the function of twist drill?
8. List different heat treatments for cutting tool.
9. Name different elements of tool design.
10. What is the function of reamer?
11. Define nose radius.
12. Define tool signature.
13. What is the full name of BIS and ISO?
14. Define form tool.
15. Define correction.
16. What is the function of end mill?
17. Differentiate cutting tool and machine tool with example.
18. Classify different types of cutting tools.
19. List different cutting parameters of cutting tool.
20. Briefly explain about properties of cutting tool material.
21. Explain briefly about different types of carbide inserts.
22. What is re-sharpening of cutting tools?
23. What is positive and negative back rack angle in single point cutting tool?
24. Explain briefly tool designation.
25. State the applications of high carbon steel.
26. List application of diamond tools.
27. Explain the method of re-sharpening of drill points.
28. Explain about the three groups of cemented carbides.

29. State the limitation of high speed steel tool material.
30. Draw neat sketch of plain milling.
31. What is single point and multi point cutting tool? Explain with example.
32. Explain briefly about different types of form tools.
33. Explain importance of correction.
34. Classify different milling cutters.
35. Write short note on applications and selection criteria of cutting tool material.
36. Discuss about the heat treatment of cutting tool with suitable example.
37. Explain tool design process with different steps.
38. Write short note about twist drill with neat sketch.
39. List the characteristics of ceramic tool materials.
40. With neat sketch explain side and face milling cutter.
41. Discuss graphical method of applying correction.
42. Write shot note on tool setting devices with examples.
43. With neat sketch discuss about different types of end mill.
44. Explain in detail about each elements of tool design.
45. Discuss about importance of tool design.

Unit-4

DESIGN OF JIGS AND FIXTURES

1. Define jig.
2. Define fixture.
3. What is locating?
4. Define clamping.
5. Define degree of freedom.
6. What is the function of ejecting pin?
7. List different operation in which we can use jig.
8. What is the material of locating pin in jig?
9. To locate cylindrical job which type of locater is most suitable?
10. List different types of clamping devices.
11. Name any three standard locating devices.
12. Explain aim of clamping.
13. List different parts of jig.
14. What is the function of bush in jig?
15. Name different types of bushes used in jig.
16. Define loading and unloading.
17. Define tennon.
18. What is the function of T-bolt?
17. List different types of jigs.
18. Name different types of fixtures.
19. In brief explain fool-proofing.
20. Classify milling fixture.
21. Name the elements of milling fixture.
22. What is use of stop pin in machine vices?
23. Name any four locators that generally used.
24. Give the importance of clamping force.
25. Explain concept of degree of freedom.
26. List the principles helps to achieve proper location.

27. Explain the aim of clamping.
28. State the basic factors for the design of jig and fixture.
29. State the function of setting box and tennon strips.
30. Explain nesting locator.
31. Explain in brief about toggle clamping.
32. Discuss about wedge clamp.
33. Draw neat sketch of strap clamp.
34. Explain 3-2-1 principle of location with a neat sketch.
35. Discuss the rules to be followed to achieve the aim of clamping.
36. List different types of locators and neatly sketch any five.
37. Write short note about locating and clamping with view point of productivity and interchangeability.
38. List different types of clamping device and write with neat sketch about any two.
39. Discuss about locating and clamping principles in day-to-day supervision on shop floor.
40. Discuss methods used to locate job on flat surface.
41. Explain briefly about location of job by its internal and external surfaces.
42. Differentiate jig and fixture.
43. Discuss about importance of jig and fixture in manufacturing.
44. Explain steps of design jig and fixture.
45. Discuss in detail about different points to be consider during design of jig and fixture.
46. Explain different selection criteria for jig and fixture.
47. List various types of jig and state application of each.
48. With neat sketch write short note on template jig and plate jig.
49. Discuss about Leaf jig, box jig and channel jig.
50. Draw neat sketch of angle plate jig, multi station jig and sandwich jig.
51. Discuss about indexing fixture.
52. Write short note on angle plate fixture and vice jaw fixture.
53. Explain with neat sketch turning fixture.
54. Discuss how jig and fixture are used in mass production.

Unit-5

DESIGN OF PRESS TOOLS

1 What is the function of pilot in press tool?
2 Write the industrial applications of press tool.
3 What are slitting and notching operation?
4 Draw the neat sketch of press tool with all notations.
5 Define die clearance. Discuss its type in detail.
6 State and explain the types of strippers used in press tool.
7 Differentiate between compound dies and progressive dies.
8 Define: (1) Perforating, (2) Notching.
9 Classify the press tools based on operation.
10 Enlist the components of press tool.
11 Explain the working of press with neat sketch.
12 What is die clearance? Discuss along with their types. Why it is provided?
13 Explain progressive die with neat sketch.
14 Explain the methods of reducing cutting force.
15 Define: Press tool and Press working.
16 Explain shut height of press.
17 State the concept and meaning of "Center of Pressure".
18 Explain the cutting action in a die.
19 Draw the figure of a Press with all notations
20 List various types of stock stops. Explain the working of any one.
21 Explain "Automatic stop" with neat sketch.
22 Define the functions of tool holder and piercing punch.
23 List the reasons for providing die clearance.
24 State the reason for using pilot.
25 State the factors which affect clearance between punch and die.
26 What are strippers in die accessories? Why they are used?
27 What is die clearance? Discuss along with their types.
28 Describe "Knock-out" mechanism.
29 Define notching and nibbling.
30 Write function of dowel pin and pilot pins.
31 List the applications of progressive die.
32 Describe press working.
33 Explain "Finger stop" with neat sketch.
34 Enlist different types of pilot and explain any one.
35 Explain the stages involved in die cutting operation with sketches.
36 List important elements included in press tool assembly.
37 Classify the press tools based on operation performed on them.
38 Write the effects of providing more die clearance.
39 Discuss the methods for reducing cutting force on punch and die with sketch.

40 What is center of pressure? Explain importance of it in press tool design.
41 Explain analytical method to find out center of pressure with example.
42 Differentiate between compound dies and progressive dies.
43 Define angular clearance with neat sketch.
44 Define pressure plate.
45 List advantages of strip layout.
46 Enlist various types of strippers with its uses.
47 Explain important elements included in press tool assembly.
48 Name the methods to determine center of pressure and explain any one.
49 Explain the steps of the die design in relation to design of a cutting die.

Unit-6

DESIGN OF LIMIT GAUGES

1. Define Gauge. Why they are used?
2. Define: Fits, Limits.
3. Define: Tolerance, Allowances.
4. Describe Tailor's principle.
5. What do you mean by fundamental deviation?
6. Define the term Clearance.
7. Mention the name of the gauge that can be used for checking following:
   a. Shaft, Wire, Wheels, Pulley.
8. Mention the name of the gauge that can be used for checking following:
   a. Screw, Nut, Bolt, Hole
9. Name different types of gauges.
10. Write down advantages of gauging.
11. Classify limit gauges.
12. State the applications of different types of gauges.
13. Why adjustable gauge is used?
14. Differentiate between plug gauge and ring gauge.
15. Differentiate between gauging and measurement
16. Design limit gauge to check hole of diameter 30±0.05 mm.
17. What is limit gauge? Give name of it and explain Snap and Ring gauge with neat sketch.
18. What is the difference between standard gauges and limit gauges?
19. Write the short note on Gauge wear tolerance.
20. Write the short note on fixed limit gauge.
21. Write the short note on Position gauge.
22. Explain with neat sketch:
    a. Transition fit
    b. Clearance fit
23. Design a limit gauge to check shaft diameter of 20±0.05 mm.
24. Classify the gauges based on the purposes for which they are used.
25. Give the functions of the following with neat fig. :
    a. Form gauge
    b. Taper gauge
26. Give the functions of the following with neat fig. :
    a. Screw gauge
    b. Feller gauge
27. Give the functions of the following:
    a. Reference gauge
    b. Air gauge
28. Draw the figure of any three limit gauges.

29 Give the difference between:
30 Work tolerance and gauge tolerance
31 Go member and Not Go member
32 Explain types of Fit with its definition.
33 Give meaning of followings:
   a. Upper deviation
   b. Lower deviation
   c. Fundamental deviation
34 What do you mean by "shaft basis" system and "hole basis" system? Explain with neat sketch.
35 What are the types fit? Describe the differences.
36 What is meant by tolerance? How many types of tolerance is there? Explain.
37 Draw a sketch indicating interrelationship between tolerances and limits.