

**Department of Mechanical Engineering
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**MANUFACTURING PROCESSES - 1
Questions Bank for Laboratory Exercises
TA-202**

All answers must be brief and to the point. Sketches must be neat and self-explanatory.

Lathe Machine:

1. What are the units of cutting speed and feed on machine tools?
2. What is the use of back gear arrangement in a lathe headstock?
3. How is the rotation imparted to a part, which is to be turned between centers?
4. What are the different ways of mounting the work on a lathe?
5. What is the use of Center drilling?
6. What is the function of chasing dial?
7. What is the difference between the lead and the pitch of a multi-start thread?
8. Calculate the gear ratio between the spindle and the lead screw for cutting a screw with X threads per mm. The lead screw pitch is Y mm.
9. Why is the main spindle of a lathe hollow?
10. List the type of surfaces produced by turning.
11. Sketch the plan/top view of different types of cutting tools you have used during the lathe exercise and indicate their respective names.
12. What are the instruments used for measuring the diameter of a turned shaft?
13. What is the instrument normally used for measuring lengths of various parts?
14. Explain how you can determine the taper angle of a taper pin?
15. Calculate the time required for single pass straight turning of a cylindrical bar (diameter D length L) at a spindle speed of N rpm and feed F in appropriate units.
16. Main scale of a Vernier has 10 divisions/cm and the least count of the instrument is 0.01mm. What should be the length of each division on the Vernier scale?
17. How are the spindle speeds changed?
18. Write a relationship between spindle speed and cutting speed?
19. Write a relationship between feed rate (mm/min) and spindle speed?
20. By the use of back gears, do you get lower spindle speeds or higher spindle speeds?
21. Draw figures of left hand turning tools and right hand turning tools.
22. How is the size of a lathe specified?
23. Why are the follow-rest and steady-test used?
24. What are the Live Center and Dead Center of a lathe machine?

MILLING:

1. How is a milling cutter mounted?
2. What is the main difference between a horizontal and a vertical milling machine?
3. Explain what is meant by a universal milling machine.
4. Why are helical tooth milling cutters usually preferred over straight tooth cutters for slab milling?

5. Why is down milling generally avoided?
6. What are the advantages of up milling?
7. What special attachment is needed in the milling machine to perform down milling?
8. In what respect does a slitting saw differ from a narrow milling cutter?
9. How milling cutters are generally classified?
10. What is the difference between a plain milling cutter and a side-milling cutter?
11. How does a universal dividing head differ from a plain dividing head?
12. When does a universal indexing become essential?

SHAPING:

1. What is the driving mechanism on the shaping machine?
2. Why is quick return effect important?
3. What happens to the quick return ratio when the stroke length is reduced?
4. How do you feed a workpiece on a shaping machine?
5. Why is clapper box provided on a shaper?

DRILLING:

1. To which elements (tool and work) the speeds and feeds are provided on
(i) Lathe, (ii) Milling machine, (iii) Shaper and (iv) Drilling machine.
2. What type of speed variation mechanism is provided in the drilling machines you have studied in the TA202 Lab.?
3. What material is generally selected for the machine tool structure?
4. What types of guides are used for the main slideways of the basic machine tools?
5. How are the sizes of various basic machine tools specified?
6. Why square threads are used on driving screw of a machine tool?
7. Which of the following processes give intermittent cutting? (a) Milling, (b) Drilling, (c) Shaping, (d) Turning.
8. What makes the simultaneous rotation of the spindle and the feed motion possible on drilling machines?
9. What are the functions of flutes on a twist drill?
10. Explain how power is transmitted from the drill spindle to the drill shank?
11. Why drilled holes are generally, slightly larger than drill diameter?
12. What is the primary purpose of reaming?
13. Sketch a twist drill and name its principal parts.
14. Name the principal kinds of reamers.
15. How is the diameter of a drilled hole measured?
16. What is the approximate order of magnitude by which a hole diameter increases after reaming?
17. What will happen when the drilling is done with dull drill?
18. What are the types of tapes in a hand operated tap set?
19. Why a coarse file is used for soft work materials?
20. Describe very briefly the important features of files?

21. Why the number of flutes on a reamer is always even?
22. How is the drill held in a spindle?
23. Why is the cutting fluid generally not used during drilling cast iron?
24. How are the files classified?
25. Distinguish between second cut and double cut files.
26. What is a scraper?
27. Does a saw blade cut on a return stroke?
28. What operation other than hole drilling can be performed on a drilling machine?

CNC

1. What are the different components of NC machine tool?
2. What is MCU in NC and write down its function?
3. Clearly explain with figure point-to-point motion control and continuous path motion control used in NC machines? Which control system is generally used to perform machining on the work pieces?
4. What is closed loop control system and open loop control system used in NC machine? What are the differences between them? What are the motors used for each type?
5. What is adaptive control system?
6. Write down the differences between incremental positioning and absolute positioning system used in NC machine?
7. Which system of co-ordinate system is used in NC machine? Write down the directions of positive X, Y and Z-axes in case of a lathe.
8. Name the different types of tape format: a) Fixed sequential format; b) Block-address formatc) Tab-sequential formatd) Word address format.
9. What is ATC in CNC machine?
10. Write down the functions of few G codes like G01, 002 003,004 etc.
11. N0100 G02 X9.000 Y8.000 I5.000 J2.000 F6.000, Explain each term for this block of part program.
12. What is BLU programming used in NC part programming?
13. Explain the terms "tool length compensation" and "cutter diameter compensation".
14. What is liner interpolation and what is circular interpolation?
15. What is canned cycle used in NC part program?
16. What is fixed zero system and floating zero system?
17. What is rapid traverse, fine feed and creep feed?
18. What are the different types of tool used in NC machine?

-----**Good Luck**-----