KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY

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DEPARTMENT OF MECHANICAL ENGINEERING

OA1553/PRODUCTION TECHNOLOGY OF AGRICULTURAL MACHINERY

QUESTION BANK

UNIT NOTES

UNIT I ENGINEERING MATERIALS

PART-A

1. What are three primary groups of plain carbon steels?
2. What are the primary effects of chromium, and copper as alloying elements in steel?

Effects of alloying copper: Increases strength, and increases corrosion resistance.

3. What is the effect of alloying Silicon and Cobalt in steels?
4. Which alloy elements are basically a) carbide(stabilizers) formers, and b) graphite stabilizers) promoters?
5. What makes a stainless steel "stainless"?
6. What are the required properties of a tool steel?
7. What are HSLA steels? Where are they used?
8. What are Maraging steels? Give its composition.
9. What are the features that make cast iron an important material?
10. What is the difference between malleable cast iron and ductile cast iron?
11. What are the primary effects of adding Ni, and Mo in cast irons?
15. How do you classify Cast irons?
16. What are gun metals? Give its composition?
17. What is meant by precipitation hardening?
18. What are super alloys?

PART-B

1. Describe the properties and typical applications of Low, Medium and high carbon steels?
2. Summaries the effect of the following elements as alloying additions to steels: Mn, Si, Cr, Mo, V, Ti, Al, Si, Cu, W?
3. Describe the different types of stainless steels, making reference to approximate compositions, structures, heat treatments and applications ?
4. Write an engineering brief about (a) Tool steels (b) HSLA steels (c)Maraging steels (d)High speed steels?
5. Describe the structures of main types of Cast iron and explain the factors which affect the structure of Cast iron?
6. Discuss the composition, properties and typical applications of Copper alloys?
7. Explain the mechanical properties of materials?

UNIT II MACHINING

PART-A

1. How are shaping machines specified?
2. Stateany two reasons for making the stroke length greater than work length.
3. Write down any four operations that can be performed in a drilling machine.
4. What is meant by dressing and truing?
5. What are the differences between up-milling and down milling?
6. State the various parts mounted on the carriage.
7. Write down any four operations performed by a shaper.
8. List the various types of planers.
9. What is gang-drilling machine?
9. What is an apron?
10. How are shaping machines specified?
11. What are the specifications of grinding wheel?
12. What is a shell mill?
13. List the various advantages of vitrified bond.
14. What is thread milling?
15. Classify milling machines.
16. What are the specifications of milling machine?
17. Define milling process.
18. Define feed and depth of cut.
19. Write any four operations performed by a shaper?
20. What are the precautions to be carried out before machining any surfaces?

PART-B

1. Explain the construction and working principle of a lathe with suitable diagram?
2. Explain about operations performed in a lathe machines.
3. What are the types of quick return mechanism available in shaper machines? Briefly explain the crank and slotted link mechanism?
4. Briefly explain about the feed mechanism available in the planner machines.
5. Define milling? Explain with neat sketch the principle of operation of the milling machine.
6. Explain about the types of abrasives used in grinding wheel.
7. Explain the types of operations in cylindrical grinding.
8. Explain about the operations performed in drilling machines.
9. With a neat sketch explain the working principle of radial drilling machines.
10. With a neat sketch explain the column and knee type milling machine and name its main parts?
11. What are the different type milling cutters that are used in milling and explain any four types with neat sketch? (Plain and end milling cutter very important)
12. Distinguish between climb and conventional milling. Explain their characteristics?
13. Describe the terms dressing and trueing of grinding wheel?
14. Describe the terms dressing and trueing of grinding wheel?
15. Discuss various bonding materials used for making grinding wheel?

UNIT III **WELDING**

PART-A

1. What is the principle of resistance welding?
2. What is the role of fluxes in welding? Or function of flux in welding?
3. List out any four arc welding equipment.
4. What is the principle of Thermit welding?
5. What are the different types of gas flames? How are they formed?
6. Differentiate soldering and brazing.
7. What is the chemical reaction occurs in thermit welding?
8. What are the advantages of carbon arc welding?
9. Differentiate between oxy-acetylene and air-acetylene welding
10. What are the advantages of A.C arc welding?
11. What is the principle cause of cracks in weld metals?
12. How do you specify an electrode?
13. What is the function of shielding gas in welding?
14. Why laser welding is used only for micro-welding applications?
15. Define resistance welding
16. What is flux? Why is it essential to use it in some welding situations?
17. What are the defects that are generally found in welding?
18. List any four applications of TIG welding process.
19. Is flux necessary in Brazing process? If yes why?
20. How slag inclusions in welding is avoided?

PART-B

1. i. Distinguish between gas and arc welding ii. What are the advantages of welding?
   iii. Explain percussion welding
2. i. Describe Electro slag welding
   ii. Distinguish between soldering and brazing
3. i. Explain spot welding
   ii. Explain submerged are welding
4. i. Explain the electron beam welding process with a neat sketch
   ii. Write a brief note on "Welding defects"
5. i. Sketch the three types of Oxy-acetylene flames and state their characteristics and applications.
   ii. Describe the electro-slag welding process with a neat sketch.
6. i. What is the principle of resistance welding and explain the seam welding?
   ii. Describe plasma arc welding
7. i. What are the different types of electrode? What are the functions of flux coating?
   ii. What is the principle of friction welding?
8. i. Describe metal inert Gas arc welding process with a neat sketch.
   ii. Briefly explain on butt welding process
9. i. Give a brief account of classification of welding processes?
   ii. Explain TIG welding process variables and enumerate its advantages

10. i. Describe shielded metal arc welding process with suitable diagram. What are its applications?
    ii. What is the difference between welding, brazing and soldering process?

UNIT IV
ADVANCED MACHINING PROCESS

PART-A

1. List the unique benefits offered by WJM process.
2. Differentiate between EDM and wire cut EDM process?
3. What the process parameters of electro chemical machining?
4. State the principle of LBM.
5. Why is the deflection coil provided for electron beam machining?
6. State the working principle of abrasive jet machining.
7. List the typical applications of ultrasonic machining.
8. Define a few type of work materials for USM.
9. Predict few applications of AJM.
10. Explain the two applications of USM.
11. List the purpose of dielectric in EDM.
12. Define the range of pulse duration and current in EDM.
13. Describe the recent developments in EDM process.
14. Separate a few varieties of power supply circuits commonly used in electrical discharge machining.
15. Explain the principle of operation of wire-cut EDM process.
16. Assess the ways of gap-flushing used in EDM.
17. List the Tool materials used in ECM.
18. Describe the Process parameters of ECM.
19. Identify the Limitations of ECM.

PART-B

1. List the AJM process with neat sketch, write its applications and advantages.
2. Describe USM and conventional machining
3. Describe a schematic layout of AJM and explain its operational characteristics. What are the methods adopted to have an effective control over the mass flow rate of the abrasive?
4. Summarise the process of the WJM and the process parameters
5. Describe the methods of generating the ultrasonic and characteristics of the various types of tool holders and the tool feed mechanism in USM process and the process parameters
6. Describe the process of Wire cut EDM and list its advantages and disadvantages, applications, limitations.
7. Explain the brake down mechanism in EDM process.
8. Briefly explain various types of dielectric fluid and its functions in EDM process.Examine the process of EDM, its process parameters, advantages, disadvantages and applications.
9. Demonstrate the working principle of chemical machining. What are the factors on which the selection of a resist for use in chemical machining.
10. Describe Laser beam machining and drilling with sketches.
11. Explain the following in LBM process i. Advantages ii. Disadvantages iii. Application.

12.Plan the process parameters, MRR and surface finish in ECM.

UNIT V CNC MACHINE

PART-A

1. What is Numerical Control? Write its elements?
2. State the advantages of NC system?
3. What are G-Codes and M-Codes? Give example
4. List the commonly used co-ordinate system of CNC Machine tools?
5. What is point to point (PTP) System?
6. Mention main different between CNC and DNC?
7. Write different between incremental and absolute system?
8. What is meant by APT Program?
9. Compare closed loop NC System and open loop NC system?
10. With reference to CNC Manual part programming, state what is liner interpolation?
11. What is meant by canned cycle?
12. What is meant by "Tool Magazine" in a CNC machine?
13. What is a preparatory function? How to important in CNC Programming?
14. Mention advantages of stepping motor?
15. What is adaptive control

PART-B

1. Explain the various steps to be followed while developing the CNC part programs?
2. Explain the working of NC Machine tools with help of a diagram?
3. Write briefly about open loop, closed loop and adoptive control systems in CNC Machine tools?
4. Write briefly about machine centre?
5. Explain part programming procedure with suitable example?
6. Describe the main constructional features of CNC machines, which distinguish them from conventional machine tools?
7. Explain the main difference between point to point and continues path type numerically controlled machine tools?
8. Explain the advantages and limitations of NC Machines?
9. Explain the various types of statements used in APT language, with suitable examples?
10. Discuss the various types of CNC Machine based on tool motion?
11. Enumerate various steps involved in wafer preparation?
12. Explain the following in CNC Machining

1. Liner interpolation 2.Circular interpolation 3.Cubic interpolation

13. Describe the spindle the feed drives. State the requirement of the drives of CNC machine Tools