

G.P JAJPUR

MECHANICAL DEPARTMENT

QUESTION BANK

ADVANCE MANUFACTURING PROCESSES, 6TH SEMESTER

MODULE 1

Modern Machining Processes

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. Explain the need for the use of unconventional machining processes compared to the conventional ones.
2. Explain the reasons why the unconventional machining processes are used.
3. Explain why the tool shape in EDM should be complementary to the final form.
4. What are the functions served by the dielectric fluid in EDM?
5. Give examples of dielectric fluid used in EDM.
6. What are the characteristics required for a good electrode material in EDM?
7. State various electrode materials for EDM.
8. Explain the application of the following electrode materials in EDM: (a) Copper (b) Graphite
9. What are the important parameters that control the material-removal rate in EDM? Briefly explain any two factors.
10. Explain the advantages and disadvantages of EDM.
11. Write a short note on wire-EDM process.
12. Write down various application areas of EDM.
13. Explain the principle of ECM with a neat sketch.
14. What are the functions served by the electrolyte in ECM?
15. Give examples of electrolytes used for ECM.
16. Describe the factors that should be considered in selecting an electrolyte in ECM.

17. What factors should be considered in selecting the tool materials in ECM?
18. What are the various tool materials used in ECM?
19. Briefly explain the various process parameters that affect the material-removal rate in ECM.
20. Explain the advantages and disadvantages of ECM.
21. Write down various application areas of ECM.
22. Explain how material is removed in USM.
23. Briefly explain about the functions of transducer and tool cone in USM.
24. What is the function of abrasive slurry in USM? Explain how the abrasive selection is made.
25. State about MRR and factors affecting it in USM.
26. Explain the advantages and disadvantages of USM.
27. Write down various application areas of USM.
28. Give a short note on LBM.
29. What are the types of lasers that are generally used in LBM? Explain their significance.
30. State about MRR and factors affecting it in LBM.
31. Write down various application areas of LBM.
32. Explain the advantages and disadvantages of AJM.
33. Describe the factors that should be considered in selecting the abrasive in AJM.
34. Give examples of abrasives used in AJM.
35. Explain how material is removed in AJM.
36. State about MRR and factors affecting it in AJM.
37. Write down various application areas of AJM.
38. Explain the advantages and limitations of electron-beam machining.
39. State about MRR and factors affecting it in EBM.
40. Give the applications of plasma-arc machining.
41. Explain the advantages and limitations of plasma-arc machining.
42. State about MRR and factors affecting it in PAM.

LONG QUESTIONS (8 MARKS)

1. Give a comparison of the unconventional processes in terms of process, material-removal rate and applications.
2. Explain the working principle of EDM with a neat sketch.
3. Briefly explain the working of an EDM machine showing important elements.
4. Briefly explain the working of an ECM machine showing important elements.
5. Briefly explain the working of an USM machine showing important elements.
6. Briefly explain the working of an LBM machine showing important elements.
7. Explain the working principle of AJM with a neat sketch. State its advantages and disadvantages.
8. Briefly explain the equipment and working principle used for electron beam machining. Give the applications of electron-beam machining.
9. Briefly explain the working principle plasma-arc machining process with neat sketch.

MODULE 2

Plastic Processing

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. Differentiate between thermoplastic and thermosetting polymers with suitable examples.
2. Write down common properties of plastics.
3. List out the basic moulding methods for plastics.
4. Briefly mention the criteria for selecting plastic processing methods.
5. Write a short note on casting processing method.
6. Explain the process calendaring.
7. Briefly explain blow moulding method for making a plastic water bottle.
8. What do you mean by vacuum forming?
9. Explain pressure bag moulding process.
10. Write down the methods for laminating plastics.

11. Write a short note on low pressure laminates.
12. Write down the applications of plastics in engineering fields.

LONG QUESTIONS (8 MARKS)

1. What are the various materials added to polymers during polymerization? Briefly mention their roles with examples.
2. What is compression moulding? Briefly explain the process with a neat sketch. Write down the advantages and applications of compression moulding.
3. Explain (i) flash type (ii) positive type (iii) landed positive type (iv) semi positive type compression moulding.
4. What is transfer moulding? Briefly explain the process with a neat sketch. Write down the advantages and applications of transfer moulding.
5. What is injection moulding? Briefly explain the process with a neat sketch. Write down the advantages, limitations and applications of injection moulding.
6. What is extrusion moulding? Briefly explain the process with a neat sketch. Write down the advantages and applications of extrusion moulding.
7. Explain the methods for manufacturing plastic laminating sheets, plastic rods and tubes.

MODULE 3

Additive Manufacturing Process

SHORT ANSWER TYPE QUESTIONS (2 MARKS AND 5 MARKS)

1. How would you define prototype in the context of modern product development?
2. What are the main roles and functions for prototypes? How do you think rapid prototyping satisfies these roles?
3. What are the fundamentals of additive manufacturing?
4. What is the *Rapid Prototyping Wheel*? Describe its four primary aspects.
5. Write down the limitations of additive manufacturing.
6. What are the other terms used in place of additive manufacturing? Justify.

7. What is your favorite term (AM, Freeform Fabrication, RP, etc.) for describing this technology and why?
8. How do you classify rapid prototyping systems?
9. Name three Rapid Prototyping Systems that are liquid-based.
10. How can the liquid form be converted to the solid form as in these liquid-based Rapid Prototyping Systems?
11. In what form of material can Rapid Prototyping Systems be classified as solid-based? Name three such systems.
12. What is the method used in powder-based Rapid Prototyping Systems?
13. Briefly explain various fundamental automated processes.
14. Briefly explain other technologies that are related to AM.
15. Which step in the entire process chain is, in your opinion, the shortest? Most tedious? Most automated? Support your choice.
16. What are the finishing processes that are used for RP models and explain why they are necessary?
17. What are the typical RP applications in design?
18. What are the typical RP applications in engineering and analysis?
19. Explain how RP systems can be applied to traditional industries like the jewelry industries.
20. What are the typical RP applications in medicals and bioengineering?
21. What are the typical RP applications in aerospace engineering?
22. What are the typical RP applications in automotive industries?
23. What do you mean by concurrent engineering? Explain briefly.
24. Write a short note on capstan and turret lathe.
25. What do you understand by the term flexible manufacturing system?
26. Explain the needs for flexible manufacturing system?
27. Write down the advantages of FMS.
28. List down the various components of FMS.
29. Write a short note on concurrent engineering.

LONG QUESTIONS (8 MARKS)

1. Describe the advantages of Rapid Prototyping in terms of its beneficiaries such as the product designers, tool designer, manufacturing engineer, marketers and consumers?
2. Differentiate between CNC and AM.
3. Broadly classify rapid prototyping systems.
4. Describe the steps involved in a general RP process chain.
5. Distinguish cleaning, post curing and finishing which are the various tasks of post processing. Name two RP processes that do not require post curing and one that does not require cleaning.
6. Explain the components of FMS: Processing Station, Material handling & storage and Computer Control System.
7. Describe the process flow of Cubic's Laminated Object Manufacturing.
8. Describe the process flow of Stratasys' Fused Deposition Modeling.
9. Describe the process flow of the 3D System Stereolithography Apparatus.