# VALLIAMMAI ENGINEERING COLLEGE
## DEPARTMENT OF MECHANICAL ENGINEERING

**Sub. Code/Name: CM7204- Competitive Manufacturing Systems**

**Year/Sem: I_PG (CAD/CAM)/I**

## QUESTION BANK

## UNIT-I MANUFACTURING IN A COMPETITIVE ENVIRONMENT

### Part-A (2 Marks)

1. Define mechanization with examples.
2. Define automation.
3. Why automation is generally regarded as evolutionary rather than revolutionary?
4. What is hard automation? Why are they so called?
5. What is soft automation? Why are they so called?
6. Explain principle of numerical control of machines.
7. What factors led to the need for and development of numerical control?
8. Explain open-loop and closed-loop control circuits
9. What are the advantages of computer-aided NC programming?
10. Explain the principle and purposed of adaptive controls.
11. What is adaptive control?
12. What are the two kinds of robot joints?
13. What are the advantages of flexible fixturing?
14. How are robots programmed to follow a certain path?
15. What are the advantages of CNC controls over DNC?
16. What are the advantages of CNC controls over NC control?
17. What are the advantages of DNC control over NC control?
18. Explain any two features of industrial robots.
19. What are the factors should be consider selection of material handling systems?
20. Name typical application of AGV.

### Part-B (16 Marks)

1. Describe the differences between mechanization and automation. Give several specific examples.
2. Are there activities in manufacturing operations that cannot be automated? explain.

3. Explain the difference between direct numerical control and computer numerical control. What are their relative advantages?

4. Describe the principle and purpose of adaptive controls. Give some example of present application in manufacturing and others that you think can be implemented.

5. List and discuss the factors that should be considered in choosing suitable material-handling systems for a particular manufacturing facility.

6. Describe the features of an industrial robot. Why are these features necessary?

7. Discuss the principle of various types of sensors, and give two applications for each type?

8. Describe the concept of design of assembly. Why has it become an important factor in manufacturing?

9. Is it possible to have partial automation in assembly? Explain.

10. What factors have led to the development of automated guided vehicles? Do they have any disadvantages? Explain your answers.

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## QUESTION BANK

## UNIT-II GROUP TECHNOLOGY & FLEXIBLE MANUFACTURING SYSTEMS

### Part-A (2 Marks)

1. What is group technology?
2. What do you understand concept of part family?
3. What are the various types of coding systems widely used?
4. Explain mono-code.
5. Explain poly-code.
6. Explain mixed-code.
7. What is a MICLASS system?
8. What is a DCLASS system?
9. What is production flow analysis?
10. What is meant by cellular manufacturing?
11. What do you understand by cell design?
12. Explain any two criteria used for cell design.
13. What are exceptional elements and bottleneck machines?
14. What is a flexible manufacturing system?
15. List various components of FMS
16. What are AGVs? How do they operate?
17. Explain any two functions of the material handling systems in a FMS
18. Distinguish between FMC and FMS.
19. Distinguish between dedicated FMS and random-order FMS
20. Write any two application and advantages of a FMS.

### Part-B (16 Marks)

1. Briefly discuss the various benefits of implementing a GT in a firm. Also bring out the advantages and limitations of using GT.
2. Explain the concept of part family with a suitable illustration.
3. Discuss with examples the following: mono-code, poly-code and mixed code.

4. Explain the Optitz classification system generally used in group technology.

5. Write an engineering brief about (i) DCLASS, and (ii) CODE classification systems.

6. What is production flow analysis? List the steps involved in carrying out PFA.

7. What is meant by cellular manufacturing? Explain in detail, single-linkage clustering algorithm used for cell formation.

8. With suitable sketches, explain the various FMS layout configuration prevalent today.

9. Bring out the various functions that are performed by FMS computer control systems.

10. List and explain the functions of the material handling systems.

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## QUESTION BANK
## UNIT-III COMPUTER SOFTWARE, SIMULATION AND DATA BASE OF FMS
### Part-A (2 Marks)

1. What are the factors involves product design?
2. What are the factors influence the FMS design?
3. What are the trade-off issues?
4. How will you classify FMS?
5. What is sequential flow FMS?
6. What is a single-station system?
7. What is meant by random flow system?
8. List software's used in FMS.
9. What is meant by extrinsic functions?
10. What is meant by intrinsic functions?
11. What are the factors consider in extrinsic functions?
12. What are the factors should be consider in intrinsic functions?
13. What is meant by knowledge-based systems?
14. What is meant by tool management systems?
15. Explain role of software in tool management systems.
16. What are the factors should be consider in tool management systems?
17. How will you specified software specification in FMS?
18. What are absolute specifications?
19. What are the advantages of system simulation?
20. List atleast four manufacturing data.

### Part-B (16 Marks)

1. Briefly explain various systems issues in FMS.
2. Explain FMS system concepts. How will you classified basic FMS.
3. Explain following terms: (i) Sequential flow (ii) Single-station and (iii) Random flow.
4. Briefly explain various types of software in FMS.

5. Briefly explain extrinsic and intrinsic functions. What are factor should be consider implement in FMS?

6. Explain various software design requirements.

7. How are software and hardware selected for the applicants of manufacturing automation?

8. State the reasons why companies need databases.

9. State the factors that are critical to database design and explain why.

10. What are the applications of simulation in CAD/CAM?

## QUESTION BANK

### UNIT-IV LEAN MANUFACTURING

#### Part-A (2 Marks)

1. State the four principles of lean production.

2. Define Total Productive Maintenance.

3. What is the meaning of Standardization? What is the term opposite to standardization?

4. What do you mean by waste in Lean Production?

5. What is the difference between Takt Time and Cycle Time?

6. Differentiate between Preventive maintenance & Breakdown maintenance?

7. What is the basic difference between Value Engineering & Value Analysis?

8. What are the steps involved in PDCA cycle?

9. How does Agile Manufacturing differ from FMS?

10. What is the purpose of Andon in Lean Production Management?

11. Define Quality Function Deployment (QFD)?

12. Define Kaizen.

13. Define JIT.

14. What do you understand Poka-Yoke?

15. What is meant by Muda (Waste)?

16. Explain principles of JIT.

17. Explain 5S System.

18. What do you understand man power reduction.

19. What is the quality circle activity?

20. What is systematic planning methodology?

#### Part-B (16 Marks)

1. What are the several basic steps that would lead to start Total Productive Maintenance? Explain them.

2. State the conditions that need to be fulfilled in order to implement JIT concept effectively.

3. Explain Poka Yoke systems with two examples.

4. Discuss Hoshin planning with a case study.

5. Write an engineering brief about 5S systems.

6. Explain MUDA and KAIZEN with examples.

7. Write an engineering brief about lean culture.

8. Briefly explain Jidoka concept.

9. State the conditions that need to improve worker involvement in production.

10. Write an engineering brief about quality circle activity.

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## QUESTION BANK

### UNIT-V JUST IN TIME

### Part-A (2 Marks)

1. What are the benefits of flexible work force?

2. Why "kanban" system is called a "pull" or demand system of inventory control?

3. Define small lot sizes.

4. What do you understand flexible work force?

5. What is preventive maintenance?

6. Define kanban system.

7. What are the factors influence impanation of JIT?

8. What do you mean by lean manufacturing?

9. What do you understand close supplier ties?

10. How will be flexible work force help improve production?

11. What are the characteristics of JIT?

12. What is pull method?

13. What are the advantages of JIT?

14. What do you understand line flow strategy?

15. What are the advantages of preventive maintenance?

16. How small lot sizes reduce setup time?

17. What do you meant by on-time delivery?

18. What do you meant by zero-defects?

19. What do you meant by reliable equipment?

20. What do you understand strategic implications of JIT?

Part-B (16 Marks)

1. Discuss the effect of setup reduction on Economic Order Quantity (EOQ) and Inventory Cost. Also state the various approaches for setup time reduction.

2. Compare lean production and mass production.

3. Discuss the characteristics of Just-In-Time (JIT).

4. Explain how a simple kanban system works.

5. Briefly discuss the PM.

6. What are the strategic implications on kanban systems?

7. Discuss various implementation issues on kanban and JIT systems.

8. Discuss the effect on pull systems with various examples.

9. Write an engineering brief about continuous flow manufacturing.

10. Explain with various applications on flexible work force in JIT.