

B.E. (Mechanical Engineering) Model Curriculum Semester-VII
PCC-ME-401 - Automation in Manufacturing

P. Pages : 2

Time : Three Hours



GUG/W/24/14262

Max. Marks : 80

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- Notes :
1. All questions carry marks as indicated.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.
 5. Attempt Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, Q. 7 or Q. 8, Q. 9 or Q. 10.

1. a) Describe various methods of work transport in detail. Explain why buffer storage is used in flow line automation. 8
- b) What are the various methods of assembly line balancing? Explain any one method with suitable example. 8

OR

2. a) Define Automation in Manufacturing? Explain its types with advantages and suitable example. 8
- b) A circular indexing machine performs 10 indexing operation at 10 separate stations. The total cycle time including transfer time between station is 15 seconds. Station breakdown time with a probability of 0.006 which can be considered equal for all stations. When these work stoppages occur it can take an average of 3 min to correct the fault. Compute
1. Proportion of downtime.
 2. Efficiency.
 3. An hourly production rate of this circular indexing machine.
3. a) Describe different method of NC part programming. What is APT? Explain various statements used in APT with suitable examples. 8
- b) Explain in detail 8
- i) CNC ii) DNC

OR

4. a) Define Numerical Control. What are its components? Explain various types of NC system. 8
- b) Explain the following 8
- i) NC Tape formats ii) NC words
5. a) Describe robot configurations. 8
- b) Discuss the importance of Robot control system. Explain the categories of robot controllers. 8

OR

6. a) What do you mean by Process Plan? Explain Generative CAPP system in detail. 8
- b) What are benefits of FMS? Explain any four components of FMS. 8
7. a) What is Material handling? Classify material handling equipment mentioning advantage and disadvantages of each. 8
- b) Explain types of AGVs. Explain Guide tape navigation in detail. 8

OR

8. a) Describe various types of AS/RS. What are its applications? 8
- b) Explain Carousel storage system with neat sketch. 8
9. a) Elaborate following for Group Technology. 8
- i) Benefits of GT
- ii) Composite part concept.
- b) What is meant by Group Technology? What are the problems in implementing GT? How to identify part families. 8

OR

10. a) Explain mechanical and electromechanical system in detail. 8
- b) What is necessity of Low-cost automation? Explain hydraulic and pneumatic system. 8
