

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

P. Pages : 2

Time : Three Hours



GUG/W/22/14262

Max. Marks : 80

- Notes :
1. All questions carry equal marks.
 2. Illustrate your answers wherever necessary with the help of neat sketches.
 3. Answer 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
 4. Due credit will be given to neatness.

1. a) What is automation in manufacturing? Explain fix, Programmable and flexible automation. **8**
- b) What is Assembly line? Give its detailed classification. Explain part delivery system used in Automated Assembly System. **8**

OR

2. a) A eight station automatic assembly system has an ideal cycle time of 10 seconds. Downtime is caused by defective parts jamming at an individual station. The average downtime per Occurrence is 3 min. The fraction defect rate is 1% and the probability that the defective part will jam at a given station is 0.6 for all stations. The cost to operate the assembly machine is Rs. 3000/- hour. The cost of components being assembled is Rs. 20 per unit assembly. Ignore other costs. **8**
- 1) Determine the yield of assembly machine.
 - 2) Determine the average production rate of good assemblies.
 - 3) What proportion of assemblies will have at least one defective component
 - 4) Determine the unit cost of assembled product.
- b) Describe various methods of work transport in detail. Explain why buffer storage is used in flow line automation. **8**
3. a) Explain the following **8**
- i) NC words
 - ii) NC Tape formats
- b) Explain in detail **8**
- i) CNC
 - ii) DNC

OR

4. a) State the merits of Numerical Control. Explain with neat sketch NC coordinate system. **8**
- b) Define Numerical Control. What are its components? Explain various types of NC system. **8**
5. a) Define Industrial Robot. Explain various types of joints used in robot. **8**
- b) What is CAPP? Explain retrieval CAPP system in detail. **8**

OR

6. a) Describe any four robot configurations. 8
- b) What is FMS? What are its benefits? Explain any three components of FMS. 8
7. a) What is AS/RS? Describe various types of AS/RS. What are its applications? 8
- b) Explain Carousel storage system with neat sketch. 8

OR

8. a) What is material handling? Classify material handling equipment mentioning advantage and disadvantages of each. 8
- b) What is AGV? Explain types of AGV. Explain Wired navigation. 8
9. a) Explain mechanical and electromechanical system in detail. 8
- b) What do you mean by Low cost automation? Explain hydraulic and pneumatic system. 8

OR

10. a) What is Group Technology? What are the problems in implementing GT? How to identify part families. 8
- b) What do you understand by low cost Automation? Explain hydraulic and pneumatic system. 8
