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First Semester M.Tech. Degree Examination, Dec.2019/Jan.2020 Automation in Manufacturing System

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain information – processing cycle of a manufacturing support system. (10 Marks)
b. What are the ten strategies for Automation? Explain them briefly. (10 Marks)

OR

- 2 a. Name different types of Automated manufacturing system. Explain them with example. (10 Marks)
b. Explain the basic Activities of manufacturing operations. (10 Marks)

Module-2

- 3 a. Define the following Terms:
i) Production capacity
ii) Utilization and availability
iii) Manufacturing lead time
iv) Work in process. (10 Marks)
- b. There are 24 Machine in the manufacturing plant and the parts produced in batch must be processed through an average of eight machines. 24 New batches are launched each week. Average operation time is 6 min. Average batch size of 30 parts, average setup time is 6 hrs and average Non operation time per batch is 12hr/machine. The plant operater an average of 80 production hours per week and Assume $A = 95\%$.
Determine :
Manufacturing lead time for an average part
i) Production Rate
ii) Plant capacity
iii) Plant utilization
iv) WIP. (10 Marks)

OR

- 4 a. What are the basic elements of Automated system? Explain them briefly. (10 Marks)
b. With neat sketch, explain the level of Automation. (10 Marks)

Module-3

- 5 a. Explain few commonly used Sensors and Automators. (10 Marks)
b. Explain the capabilities of computer process control system. (10 Marks)

OR

- 6 a. With schematic diagram components of PLC. (10 Marks)
b. With necessary flow chart, explain Retrieval CAPP system (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8 = 50$, will be treated as malpractice.

Module-4

- 7 a. What are the Basic components received in a hydraulic system. (06 Marks)
b. What are the considerations to be followed while designing a pneumatic circuit. (04 Marks)
c. With neat block diagram, explain Electro – Hydraulic Servo System. (10 Marks)

OR

- 8 a. With the help of circuit diagram, explain control of a single – Acting Hydraulic Cylinder. (10 Marks)
b. Write a short notes on :
i) Limit switches
ii) Solenoids
iii) Pressure switches. (10 Marks)

Module-5

- 9 Briefly explain the following concepts of PLC
a. PLC logic functions
b. Timers and counters
c. PLC Input – Output modules
d. Micro PLC. (20 Marks)

OR

- 10 a. Write a short notes on : (10 Marks)
i) Inventory control
ii) Shop floor control
b. Explain capacity planning (05 Marks)
c. What are the benefits of MRP users? (05 Marks)
