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First Semester M.Tech. Degree Examination, Dec.2018/Jan.2019 Automation in Manufacturing System

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Missing data may be assumed suitably.*

Module-1

- 1 a. Explain with sketch, the various functions of a manufacturing support system. (10 Marks)
b. Explain three types of automation relative to production quantity and production variety. (10 Marks)

OR

- 2 a. What are ten strategies for automation and process improvement? Explain. (10 Marks)
b. Sketch and explain model of manufacturing operations that must be carried out in a factory to convert raw materials into finished products. (10 Marks)

Module-2

- 3 a. Explain the following mathematical models of production performance:
(i) Production Rate
(ii) Production capacity
(iii) Utilization and Availability
(iv) Manufacturing Lead-Time (MLT) (10 Marks)
b. A production machine operates 80 hr/week (2 shifts, 5 days) at full capacity. Its production rate is 20 unit/hr. During a certain week, the machine produced 1000 parts and was idle the remaining time.
(i) Determine the production capacity of the machine.
(ii) What was the utilization of the machine, during the week under consideration? (10 Marks)

OR

- 4 a. With the help of a block diagram, explain the basic elements of an automated system. (10 Marks)
b. Sketch and explain different levels of automation. (10 Marks)

Module-3

- 5 a. With the help of a block diagram, explain the general procedure for using Retrieval CAPP systems. (10 Marks)
b. Write short notes on hydraulic and pneumatic actuators and also give the comparison of Hydraulic and Pneumatic systems. (10 Marks)

OR

- 6 a. With a neat sketch explain the configuration of an adaptive control system. (10 Marks)
b. Write short notes on Discrete control system. (10 Marks)

Module-4

- 7 a. Explain any Five basic components required in a hydraulic system. (10 Marks)
b. With the help of a hydraulic circuit, explain the operation of a control of a double acting hydraulic cylinder. (10 Marks)

OR

- 8 a. What are the considerations to be followed while designing a pneumatic circuit? (10 Marks)
b. Explain with a block diagram, the working of an electro-hydraulic servo system. (10 Marks)

Module-5

- 9 a. Define Programmable Logic Controller (PLC). Explain with a block diagram, the various components of a PLC. (10 Marks)
b. Write a short note on PLC input and output modules. (10 Marks)

OR

- 10 a. What is production planning and production control? Name the three of the four activities within the scope of production planning (10 Marks)
b. What is shop floor control, explain three phases in a shop floor control system with block diagram. (10 Marks)
