17ME563

Fifth Semester B.E. Degree Examination, Aug./Sept.2020
Automation and Robotics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1 a. Define Automation. What do you mean by Error detection and Error recovery in an automated system? **(10 Marks)**
   b. Write an explanatory note on:
      i) Digital to analog converters
      ii) Hardware components for automation. **(10 Marks)**

OR

2 a. Explain with a neat sketch Feed forward control. **(06 Marks)**
   b. What is ADC? Explain three phases in ADC. **(06 Marks)**
   c. Discuss the input/output devices for discrete data. **(08 Marks)**

Module-2

3 a. What is Automated Production Line? Explain three configurations used in APL with figures. **(10 Marks)**
   b. What is Storage buffers? Mention any four reasons why storage buffers are used in APL. **(10 Marks)**

OR

4 a. Discuss the problem areas in analysis and design of automated production lines. **(08 Marks)**
   b. Write short note on the following:
      i) Automatic Identification Methods
      ii) Barcode Technology. **(12 Marks)**

Module-3

5 a. With neat sketches explain the cylindrical and Jointed-Arm robot configurations. **(10 Marks)**
   b. Giving suitable examples, explain Industrial applications of Robot. **(10 Marks)**

OR

6 a. Write an explanatory note on various generations of robots. **(08 Marks)**
   b. Write short note on:
      i) End effectors
      ii) Sensors in robotics
      iii) Robot Accuracy and Repeatability. **(12 Marks)**

Module-4

7 a. Explain positions orientations and frames with respect to special descriptions. **(08 Marks)**
   b. With the help of a suitable example, explain the operators:
      i)   Translations
      ii) Rotations
      iii) Transformations. **(12 Marks)**

OR

8 a. Clearly explain with neat sketches the manipulator kinematics. **(12 Marks)**
   b. Write an explanatory note on actuator space and joint space. **(08 Marks)**

Module-5

9 a. Explain clearly the levels of Robot programming. **(10 Marks)**
   b. Discuss requirements of robot programming language. **(10 Marks)**

OR

10 Write short note on the following:
    a. Off-line programming system
    b. Problems in robot programming languages
    c. Issues in OLP systems
    d. Sub tasks in OLP systems. **(20 Marks)**

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