CBCS SCHEME

USN | | | | | | | | | |

17ME563

Fifth Semester B.E. Degree Examination, July/August 2022
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. What is Automation? Explain basic elements of 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. With a schematic diagram, explain the components of a DDC system. **(06 Marks)**

b. Define Sensor. Explain common measuring sensor used in Automation system. **(08 Marks)**

c. Discuss the input / output devices for discrete data. **(06 Marks)**

Module-2

3 a. What is Automated Production Line? Explain three configurations used in APL with figures. **(10 Marks)**

b. With schematic diagram, explain the Operation of walking beam transfer system. **(10 Marks)**

OR

4 a. Explain briefly the hardware elements of the parts delivery system at an assembly workstation with schematic diagram. **(10 Marks)**

b. Define Automation Identification and Data capture. Explain briefly bar code and RFID. **(10 Marks)**

Module-3

5 a. Define Robot. Enumerate the robot physical configurations. Explain jointed arm and polar robot configuration, with a neat sketch. **(10 Marks)**

b. Define the following : i) Work volume ii) Resolution iii) Accuracy iv) Repeatability v) End effector. **(10 Marks)**

OR

6 a. Write short note on :
i) Sensors in robotics ii) Robot Anatomy. **(10 Marks)**

b. Enumerate the ASMOV's three laws of Robotics. **(06 Marks)**

c. Discuss briefly on Robotics applications. **(04 Marks)**

Module-4

7 a. Explain positions orientation 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. Write notes on :
i) Link description ii) Link connection description. **(10 Marks)**
b. Explain Actuator space, Joint space and Cartesian space using the example of PUMA - 560. **(10 Marks)**

Module-5

9 a. Define Robot Programming Language and explain 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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