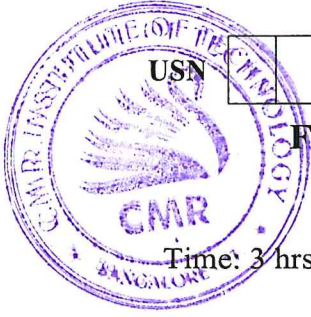


CBCS SCHEME



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 (10 Marks)
 - 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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