

Roll No.

Total Pages : 03

J-21-0155

B. Tech. EXAMINATION, 2021

Semester VII (CBCS)

INDUSTRIAL AUTOMATION AND ROBOTICS

ME-701

Time : 2 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. 9 is compulsory. Use of non-programmable calculator is allowed.

Section A

1. What are the basic elements of an Industrial Automation System ? 15

2. Explain the elements of Robot Anatomy. 15

Section B

3. Explain the Work-Envelope geometry. 15
4. Differentiate between Repeatability and Accuracy of a robotic manipulator. 15

Section C

5. Which coordinate system is required to define the kinematics of robot ? Explain. 15
6. Write the arm equation of four axis robot. 15

Section D

7. Explain the application scenario of each of the following manipulator configurations : 15
- (a) SCARA Manipulator
- (b) Articulated Manipulator.
8. Explain, how to observe performance analysis. 15

(Compulsory Question)

9. (a) What do you mean by programmable automation ?

- (b) What is pneumatic motor ?
- (c) Draw standard symbol of Unloading valve.
- (d) Differentiate between Pneumatic and Fluidics.
- (e) What is pilot operation ?
- (f) Name two methods by which path is controlled by robot controller.
- (g) What is a work space in robot ?
- (h) Define Accuracy.
- (i) List applications of robot.
- (j) Draw the diagram, of a Robot wrist and show the basic motion associated with it. $1.5 \times 10 = 15$