B. Tech. Sem - VIII (Mechanical Engg.) (2014 COURSE) (CBCS) : SUMMER - 2019

SUBJECT: ELECTIVE-III INDUSTRIAL AUTOMATION AND ROBOTICS

Day: Thursday
Date: 30/05/2019

S-2019-2919

Time: 02.30 PM TO 05.30 PM
Max. Marks: 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat diagram **WHEREVER** necessary.
4) Use of non-programmable calculator is **ALLOWED.**
5) Assume suitable data, if necessary.

Q.1 Elaborate the concept of automation and robotics. What is the need of automation? **(10)**

OR

Q.1 Explain the role of following building blocks in automation system **(10)**

i) Sensors
ii) Analyzers
iii) Actuators
iv) Drives

Q.2 What is mean by transfer lines in manufacturing systems? Explain with neat figure types of transport systems. **(10)**

OR

Q.2 State the design and fabrication considerations in the automation systems. **(10)**

Q.3 Classify the robots based on co-ordinate systems. **(10)**

OR

Q.3 Explain the terms for any robot system: Spatial Resolution, Compliance, Load carrying capacity. **(10)**

Q.4 How colour sensor works? Draw a neat circuit diagram and explain in brief. **(10)**

OR

Q.4 Explain working of absolute encoder used for position sensing in robotics. **(10)**

Q.5 Derive the expression for homogeneous transformation for rotation and translation motion of 2-DOF robot manipulator. **(10)**

OR

Q.5 For the vector $V = 25i + 10j + 20k$, perform a translation by a distance of 10 units in X direction, 7 units in Y direction and 2 units in Z direction. **(10)**

Q.6 State textual robot programming types. What are the advantages and disadvantages over leadthrough programming method. **(10)**

OR

Q.6 Explain following applications of robot in detail **(10)**

i) Telechiric Robots
ii) Survillance Systems

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