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Question Paper Code: 31585

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Elective

Electronics and Instrumentation Engineering

01UEI908 - ROBOTICS AND AUTOMATION

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is meant by degrees of freedom?
2. What is meant by gearing ratio?
3. List the types of hydraulic actuator.
4. Define Robot manipulators.
5. Define the manipulator dynamics.
6. Give the basic types of robot programming languages.
7. Compare forward and reverse kinematics.
8. What is segmentation in robot kinematics?
9. List the application of the robot in non-manufacturing field.
10. What are the factors to be considered for selection of robot?

PART - B (5 x 16 = 80 Marks)

11. (a) Explain the working of any two robot actuators with neat sketches. (16)

Or

- (b) (i) State the Asimov's laws of robotics. (6)
(ii) Discuss about the different industrial robot controls and dynamic performance. (10)
12. (a) (i) Contrast the pneumatic and electric drives with range, merits and demerits. (6)
(ii) Explain the magnetic and tactile sensors in Robotics. (10)

Or

- (b) Explain the image processing analysis made by robot vision techniques. (16)
13. (a) Explain in detail about the kinetic energy of a robot manipulator. (16)

Or

- (b) Explain in detail about various actuating mechanisms of mechanical actuator with neat sketch. (16)
14. (a) Discuss in detail about the general considerations adopted in robot material handling. (16)

Or

- (b) Explain the Hill climbing techniques in path planning of the robot. (16)
15. (a) Design a Robot work cell to sort, assemble and solder the components in PCB manufacturing. (16)

Or

- (b) Illustrate the operations of robots in manufacturing industrial applications. (16)
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