PVP 14

Code: AE6T6FE-A, CS6T5FE-B, EC6T6FE-F, EE6T6FE-F

III B.Tech-II Semester–Regular/Supplementary Examinations–March 2019

ROBOTICS

(Common for AE, CSE, ECE & EEE)

Duration: 3 hours Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1. a) Differentiate between autonomous and manual robots.
   b) What is robot and robotics?
   c) Differentiate joint coordinates and world coordinates.
   d) What are basic components of robot?
   e) What do you mean by homogeneous transformation?
   f) What do you mean by forward kinematics and inverse kinematics of a robot?
   g) What are the four DH parameters?
   h) Give a brief classification of actuators used in robots.
   i) What is the use of potentiometers?
   j) List out different robot programming languages.
   k) What features are required for robot in spot welding?

PART – B

Answer any *THREE* questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) What is the importance of Automation in industry? Explain. 8 M

   b) Describe the classification of robots by coordinate system. 8 M

3. a) Discuss in detail the architecture of robot system. 8 M

   b) How many degrees of freedom does a wrist have? What is the purpose of these degrees of freedom? 3 M

   c) Describe the requirement and challenges of end effectors. 5 M

4. a) Explain co-ordinate frame assignment of DH representation. 6 M

   b) Solve n example problem of forward kinematics for a planer two link RR manipulator with H matrices. 10 M

5. a) Define actuator? Describe the working of Hydraulic actuating system with a neat diagram. 8 M

b) Explain principle and construction of inductive type proximity sensors. 8 M

6. a) Describe briefly Robot programming languages. 7 M

b) Explain with neat diagram how Robot can be gainfully employed in the inspection methods of component made in large number. 7 M

c) Explain use of Robots in the field of painting. 2 M