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**B.E. (Part Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2013**

Electronics and Communication Engineering

Sixth Semester

**PTEC 9040 - ROBOTICS**

(Regulation 2009)

34

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

**PART-A (10 x 2 = 20 Marks)**

- 1) Define industrial robot
- 2) What is the need for industrial robot?
- 3) How do you determine work volume of a robot?
- 4) What are the desirable features of a sensor?
- 5) What is meant by a robot programme?
- 6) List out basic interlock commands available
- 7) Define work cell
- 8) List out different task carried out by robot work cell
- 9) What are the applications for advanced robot?
- 10) List out any four technical developments occurred in the development of robot?

Part B

(5x16=80 marks)

- 11 i) What is the scope of industrial robot in medical application? Briefly discuss any one application of robot in hospital (8 marks)
- ii) What is the future technology available for the development of robot? Explain any one future application (8 marks)
- 12 a) i) Explain the importance of Robotics in Automation (8 marks)
- ii) Explain about the Robot Anatomy and configuration (8 marks)

(or)

- b) What are the basic components in the industrial robot? Briefly explain the end effector devices (16 marks)
- 13 a) i) What are the characteristics of task level language? Explain (8 marks)
- ii) How do you specify and describe the task in high level language? Explain with a suitable example (8 marks)

(or)

- b) Write statements for defining a coordinate frame grasp which can be obtained by rotating the coordinate frame block through an angle of  $65^\circ$  about the Y axis and then translating it 4 and 6 inches in the X and Y axes, respectively using any robot oriented language (16 marks)
- 14 a) i) What are the different control methods available in controlling the robot? Briefly explain any two control methods (8 marks)  
ii) What is the function of operator interface? Explain (8 marks)
- (or)
- b) List out the safety rules applied in robot and explain how do you apply the safety during design stage (16 marks)
- 15 a) i) What are the technical challenges for remotely operated Underwater robotics? Explain briefly about the challenges (8 marks)  
ii) How new enabling technologies are useful in underwater robotics? Explain (8 marks)
- (or)
- b) What are the specific features required for space robot? How do you built advanced space robot (16 marks)