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Question Paper Code : 57272

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Sixth Semester

Electronics and Communication Engineering

EC 6003 – ROBOTICS AND AUTOMATION

(Regulations 2013)

8/6/16

AN

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What is meant by work envelope ?
2. What is the need of dynamic stabilization of robot ?
3. Define micro machines in robotics.
4. What is a frame grabber ?
5. List the various classification of gripper mechanism.
6. Compare electronic and pneumatic manipulator control.
7. What is meant by forward and inverse kinematics ?
8. Give a short note on hill climbing techniques.
9. List the applications of manufacturing and non-manufacturing application areas of robotics.
10. How interfacing is provided in the design of robot assembly ?

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Explain the four common Robot configurations with neat sketch. (8)
(ii) Explain robot parts and their function with neat sketch. (8)

OR

- (b) (i) Write short notes on Joint Notation Scheme. (8)
(ii) Discuss about the need for robots. (8)

12. (a) (i) Sketch and explain the working of a fiber optic sensors. (8)
(ii) Sketch and explain the operation of stepper motor. (8)

OR

- (b) (i) Explain in detail about different methods of path determination. (8)
(ii) Sketch and explain motor gearing ratio and variable speed arrangements. (8)

13. (a) Discuss the functions of gripper with the help of a sketch. Explain the working of any two types of gripper with neat sketch used for robots. (16)

OR

- (b) Explain in details various electronic control circuit methods employed in Manipulator Design. (16)

14. (a) Briefly discuss about different methods in robot programming and their capabilities and limitations. (16)

OR

- (b) Discuss the different inputs to an inverse kinematics algorithm. Explain the solution of a simple inverse kinematic algorithm. (16)

15. (a) Discuss the application of robot in spray painting and touch free heart surgeries. (16)

OR

- (b) What is meant by robot cell ? Explain the different robotic cell layouts ? (16)