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Question Paper Code: 59509

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Elective

Electronics and Instrumentation Engineering

15UEI909 - ROBOTICS AND AUTOMATION

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. What is the name for information sent from robot sensors to robot controllers? CO1- R
(a) temperature (b) pressure (c) feedback (d) signal
2. Spherical coordinates can uniquely define the position of a point in up to _____ CO1- R
(a) One dimension (b) Two dimensions (c) Three dimensions (d) Four dimensions
3. Variable speed drive is a piece of equipment that regulates the CO2 -R
(a) speed (b) rotational force (c) torque (d) all the above
4. Frame grabber is used to CO2- R
(a) archive the image (b) segment the image
(c) process the image (d) capture and store the image
5. Drives are also known as CO3- R
(a) actuators (b) controller (c) sensors (d) manipulator
6. End effectors can be classified into two categories which are _____ CO3 -R
(a) Elbows and wrists (b) Grippers and end of arm tooling
(c) Grippers and wrists (d) End of arm tooling and elbows
7. _____ is the first step in designing of Industrial robot CO4- R
(a) Kinematics (b) Path planning (c) Programming (d) Analyzing

8. Identify which of the following statements is *not* true in the case of inverse kinematics problem, it is much more complex because _____ CO4- R
- (a) The equation to be solved are in general nonlinear in joint variables
 (b) Multiple solutions may exist
 (c) There might be no admissible solutions
 (d) Unique solution may exist
9. Selective Compliance Assembly Robot Arm (SCARA) robot is very suitable in _____ kind of operations. CO5- R
- (a) Single Operations (b) Assembly Operations
 (c) Translatory Operations (d) Rotary Operations
10. The robotic welding have demonstrated to make it a technology the helps Many manufactures increase . CO5- R
- (a) Precision (b) Repeatability (c) output (d) all the above

PART – B (5 x 2= 10Marks)

11. Write are the Benefits of industrial automation? CO1- R
12. Compare hydraulic and pneumatic drives.. CO2- R
13. Write control techniques of robots.. CO3- R
14. List the advantages of off-line robot programming.. CO4- R
15. List any four non-manufacturing application areas of robotics. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Explain a robot structure with a sketch. What are the various types of joints used in robots? CO1- App (16)
- Or
- (b) Differentiate between the various generations of robots. CO1 -App (16)
17. (a) Differentiate and non'tactile sensors. Sketch and explain the Working of an acoustic sensor. CO2 -App (16)
- Or
- (b) How do u sense the positional accuracy of robot? Discuss and explain the suitable type of sensor used to measure the position. CO2- Ana (16)

18. (a) Discuss the functions of Grippers with help of sketch. Explain the working of magnetic grippers used in robots. CO3 -Ana (16)
- Or
- (b) Discuss the functions of manipulators. Sketch and explain a pneumatic manipulator control circuits used for robots. CO3 -Ana (16)
19. (a) Compose the algorithm of Hill-climbing Technique with flow chart and give the applications of the same. CO4- U (16)
- Or
- (b) Discuss in detail the inverse kinematic solution of a robot. CO4 -U (16)
20. (a) With suitable diagram, explain industrial application of robot in manufacturing field. CO5- U (16)
- Or
- (b) Describe briefly the operations involved in robotic spot welding. CO5- U (16)

