Question Paper Code:49508

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

Elective

Electronics and Instrumentation Engineering

14UEI908- ROBOTICS AND AUTOMATION

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Find the Odd one. A robot: CO1- R

    (a) Do not harm being   (b) Obey human being

    (c) Command human being   (d) Protects by itself

2. Maximum number of variable required to define the motion of body in   CO1- R
    space.
    (a) 4   (b)6   (c)2   (d) 1

3. The hydraulic jack in which force is transmitted from a handle by   CO2- R
    means of
    (a) water   (b) heavy oil   (c) kcl   (d) hcl

4. Frame grabber is used to   CO2- R

    (a) Archive the image   (b) Segment the image

    (c) Process the image   (d) Capture and store digital image

5. Drives are also known as   CO3- R

    (a) actuators   (b) controller   (c) sensors   (d) manipulator

6. In Design consideration of gripper, Gripper Force is depends on   CO3- R

    (a) Accuracy   (b) Tolerance

    (c) Weight of holding object   (d) Pneumatic

7. _____ is the mathematical optimization technique which   CO4- R
    belongs to family of local search.

    (a) Hill climbing   (b) Research and rescue

    (c) Surveillance   (d) Agriculture

8. Choose an irrelevant Robot language element   CO4- R

    (a) Variables, Constant   (b) Motion command

    (c) End effectors command   (d) Drive

9. Identify the material processing operation   CO5- R

    (a) Pick and place   (b)Material loading   (c) Spot welding   (d) Die casting

10. Which of the following operations continuous path system is used   CO5- R

    (a) Pick and Place   (b) Loading and Unloading

    (c) Welding   (d) All the above

<center>PART – B (5 x 2= 10Marks)</center>

11. Write Asimov's law of robotics?   CO1-R

12. List the type of hydraulic actuators   CO2-R

13. Compare electronic and pneumatic manipulator.   CO3- R

14. Explain homogeneous transformation.   CO4- R

15. Explain designing for robot assembly.   CO5- R

<center>PART – C (5 x 16= 80Marks)</center>

16. (a) Categorize the robot by configuration and control with neat sketch.   CO1- App   (16)

<center>Or</center>

    (b) Draw the block diagram of robotic system and explain the functions performed by every block of it.   CO1- App   (16)

17. (a) Differentiate and non'tactile sensors. Sketch and explain the Working of an acoustic sensor.   CO2- App   (16)

<center>Or</center>

    (b) What is machine vision? Explain the techniques of image processing?   CO2- U   (16)

18. (a) Discuss the functions of Grippers with help of sketch. Explain the working of magnetic grippers used in robots.   CO3- Ana   (16)

<center>Or</center>

(b) Classify and explain the robot end-effectors from the view point of control. Discuss the design considerations in the robot end-of-the-arm tooling.   CO3- Ana   (16)

19. (a) (i) Discuss the different inputs to an inverse kinematics algorithm and its solution.   CO4- U   (8)

    (ii) Write the homogenous transformation matrix for translation in 3D.   CO4- U   (8)

Or

(b) Discuss the various generations of robot programming languages With basic structure..   CO4- Ana   (16)

20. (a) With suitable diagram, explain industrial application of robot in non-manufacturing field   CO5- U   (16)

Or

(b) Discuss and detail about the robot computer interface and robot cell design.   CO5- U   (16)

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