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Question Paper Code: 59509

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Elective

Electronics and Instrumentation Engineering

15UEI909 - ROBOTICS AND AUTOMATION

(Regulation 2015)

Duration: 1.15 hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

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. For a robot unit to be considered a functional industrial robot, typically, how many degrees of freedom would the robot have? CO2 -R
(a) three (b) six (c) four (d) eight
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. In a rule-based system, procedural domain knowledge is in the form of CO3- R
(a) production rules (b) rule interpreters (c) meta-rules (d) control rules

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. Many words have more than one meaning; we have to select the meaning which makes the most sense in context. This can be resolved by CO4- R
 (a) Fuzzy Logic (b) Word Sense Disambiguation
 (c) Shallow Semantic Analysis (d) All of the mentioned
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. A KES knowledge base contains information in the form of CO5- R
 (a) associations (b) actions
 (c) free text (d) all of the mentioned
10. Special programs that assist programmers are called CO5- R
 (a) heuristic processors (b) symbolic programmers
 (c) intelligent programming tools (d) program recognizers

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain a robot structure with a sketch. What are the various types of joints used in robots? CO1- App (8)
12. With a neat block diagram, describe the different stages of machine vision system. CO2 -App (8)
13. Explain the different types of speed control methods using electronic components and circuits to control the robot motions? CO3 -Ana (8)
14. Static characteristics of work which promote application of robots. Discuss robot application for assembly and inspection. CO4- U (8)
15. Discuss the different inputs to an inverse kinematics algorithm. Explain the solution of a simple inverse kinematic algorithm. CO5- U (8)

