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Question Paper Code : X10692

B.E./B.Tech. DEGREE EXAMINATIONS – NOV / DEC 2020 AND APRIL /MAY 2021

Seventh/ Eighth Semester

Mechanical Engineering

ME8099 - ROBOTICS

(Common to: Production Engineering / Automobile Engineering / Manufacturing Engineering/Mechanical Engineering (SW))
(Regulations 2017)

Time: 3 Hours

Answer ALL Questions

Max. Marks: 100

PART- A (10 x 2 = 20 Marks)

1. Define robot.
2. Name the important specifications of an industrial robot.
3. What is end effector? Classify.
4. What is a mechanical gripper?
5. Differentiate between the sensor & transducer.
6. What is LVDT?
7. List the different robot parameters.
8. Write down the basic types of robot programming.
9. What is AGV?
10. What are the functions of work cell controller?

PART- B (5 x 13 = 65 Marks)

11. a) Describe the specifications of an industrial robot and with its configuration. (13)

OR

- b) Classify the robots according to the coordinates of motion with a sketch and example, explain the features of each type. (13)

12. a) Discuss about the salient features of different drive systems used in robots. (13)

OR

b) Discuss the performance characteristics of actuators. Compare electrical, pneumatic and hydraulic actuators for their characteristics. (13)

13. a) Explain machine vision system with a sketch. Give practical examples of its applications. (13)

OR

b) Explain the segmentation methods used in vision system with suitable example. (13)

14. a) Describe briefly the kinematics and dynamics of a robot. (13)

OR

b) Derive forward & inverse kinematics equations of manipulator for a particular position. (13)

15. a) Discuss in detail various methods available for the analysis of robot economics. (13)

OR

b) Write short note on Equivalent Uniform Annual cost and rate of return methods. (13)

PART- C (1 x 15 = 15 Marks)

16. a) Describe any one algorithm for image edge detection and image segmentation with advantages. (15)

OR

b) Using VAL language, discuss the basic commands and explain the structure of the program for a typical pick and place operation. (15)
