Seventh Semester B.E. Degree Examination, June/July 2024
Industrial Robotics

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Define automation. Describe different types of automation.   **(10 Marks)**
   b. Briefly explain the history of robotics over the period of years.   **(10 Marks)**

OR

2 a. Define Robotics. Explain different configuration of robots with neat diagrams.   **(10 Marks)**
   b. Describe the advantage, limitations and applications of robots in industries.   **(10 Marks)**

Module-2

3 a. Explain robot anatomy, and explain different types of joints used in robots.   **(10 Marks)**
   b. Describe different robot workcell layouts.   **(10 Marks)**

OR

4 a. Explain different considerations of selection of grippers for any application.   **(10 Marks)**
   b. Define the following :
       i)   Spatial resolution
       ii) Accuracy
       iii) Repeatability
       iv) Work volume
       v)   Degree of freedom (DOF).   **(10 Marks)**

Module-3

5 a. Explain different types of controllers used in robots.   **(10 Marks)**
   b. With a neat figure explain the working principle of encoders.   **(10 Marks)**

OR

6 a. What are actuators? Compare pneumatic, hydraulic and electric actuators used in robots.
                                                                                          (10 Marks)
   b. Derive an equation of transfer function of spring mass and damper system with the
       mathematical model.   **(10 Marks)**

Module-4

7 a. Describe the functions of machine vision system with a block diagram.   **(10 Marks)**
   b. What are transducers and sensors? Explain the functions of sensors in robotics.   **(10 Marks)**

OR

8 a. Classify different types of proximity sensors. Explain the working principle of proximity sensor. **(10 Marks)**

    b. With a neat figure explain force sensors used in robots. **(10 Marks)**

Module-5

9 a. What are the different methods of robot programming? Explain. **(10 Marks)**

    b. Describe the capabilities and limitations of lead through programming. **(10 Marks)**

OR

10 a. What is motion interpolation? Explain any two types of motion interpolation. **(10 Marks)**

    b. Describe branching, and wait, signal and delay commands used in robot programming. **(10 Marks)**

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