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6th Sem / Mecatronics, Mech (CAD /CAM Design & Robotics)

Subject:- Robotics

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 What is the main advantage of using robots in manufacturing sector? (CO1)

a) Reducing the number of employees required
b) Increasing operational speed and efficiency
c) Enhancing communication between departments
d) Reducing material costs

Q.2 Which of the following robotic systems has a Cartesian structure? (CO2)

a) Cylindrical robot b) Articulated robot
c) Cartesian robot d) Spherical robot

Q.3 What is the degree of freedom (DOF) of an articulated robot? (CO2)

a) 2 DOF b) 3 DOF
c) 6 DOF d) 10 DOF

Q.4 Which type of sensor is used to measure force in robotic applications? (CO3)

a) Proximity sensor b) LVDT
c) Force sensor d) Optical sensor

Q.5 In robotics, what does LVDT stand for? (CO3)

a) Linear voltage Differential Transformer
b) Linear Variable Distance Transformer
c) Level Voltage Data Transmitter
d) Low voltage Device Transmitter

Q.28 Describe the process of programming a robot using the manual teaching method. (CO5)

Q.29 What are the different types of programming languages used in robotics? (CO5)

Q.30 Discuss how robots are used in machine loading and unloading in industries. (CO6)

Q.31 Describe the role of proximity sensors in robotic systems and their applications. (CO3)

Q.32 Explain the concept of resolved motion control in robot programming. (CO4)

Q.33 What are the key industrial applications of robots? (CO6)

Q.34 Explain the use of motion encoders in robotic systems. (CO3)

Q.35 Discuss the significance of simulation software for robot programming and testing. (CO5)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Explain the classification of robotic systems based on physical configurations, such as Cartesian, cylindrical, and articulated robots. (CO2)

Q.37 Discuss various control system used in robotics, including adaptive and computed torque control, with examples. (CO4)

Q.38 Describe in detail the applications of robots in industries, with examples of material transfer, packaging, and inspection. (CO6)

Q.6 Identify a non-servo control system used in robotics. (CO4)

a) Closed-loop control b) Adaptive control
c) Open -loop control d) Feedback control

Q.7 What is the function of adaptive control in robotics? (CO4)

a) To control speed and torque
b) To adjust system parameters in real time based on performance
c) To monitor temperature and pressure
d) To program robots manually

Q.8 Which programming language is commonly used in robot programming? (CO5)

a) Python b) HTML
c) RAIL d) SQL

Q.9 What is the function of manual teaching in robot programming? (CO5)

a) To pre-define movements using a computer
b) To physically guide the robot through desired actions
c) To write programming code for robot tasks
d) To adjust robotic setting remotely

Q.10 Name one industrial application of robots in material handling. (CO6)

a) Painting b) Welding
c) Packaging d) Inspection

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define a robot. (CO1)

Q.12 What is meant by robot motion classification? (CO2)

Q.13 Give one key function of a motion encoder in robotics. (CO3)

Q.14 Mention one advantage of using proximity sensors in robots. (CO3)

Q.15 What is the role of an end effector in a robotic system? (CO2)

Q.16 Explain the difference between cylindrical and spherical robots. (CO2)

Q.17 Discuss significance of computed torque technique in control systems? (CO4)

Q.18 Describe one method of lead-through programming in robots. (CO5)

Q.19 Name one industrial robot used for welding applications. (CO6)

Q.20 Give one purpose of simulation software in robotics. (CO5)

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Define robotics and explain its advantages and limitations in manufacturing industries. (CO1)

Q.22 Discuss the classification of robotic systems based on control loops. (CO2)

Q.23 Describe the role of different types of end effectors in industrial robots. (CO2)

Q.24 Explain how force sensors are used in robotic applications and their importance. (CO3)

Q.25 Compare servo and non-servo control systems used in robots. (CO4)

Q.26 Discuss the basic structure of robotic system, including its degrees of freedom. (CO2)

Q.27 Explain the importance of adaptive control and its application in robots. (CO4)