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3rd Sem. /Automation & Robotics
Sub.: Robotics

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple type Questions. All Questions are compulsory. (6x1=6)

Q.1 What is the ISO defininition of a robot? (CO1)

a) A machine that can perform any task

b) A programmable machine capable of carrying out a series of actions autonomously.

c) A device for controlling industrial equipment.

d) A mechanical system with no control over movement

Q.2 Which of the following is a robotic subsystem? (CO1)

a) Motion b) Recognition

c) Control d) All of the above

Q.3 The degrees of freedom for SCARA robots are: (CO2)

a) 4 b) 5

c) 6 d) 7

Q.4 What type of actuator is used for precise speed control? (CO3)

SECTION-D

Note: Long answer questions. Attempt any two questions out of three Questions. (2x8=16)

Q.23 Discuss in detail the classification of robots and their industrial applications. (CO1)

Q.24 Explain the different types of robotic sensors, with examples of their applications in real world systems. (CO4)

Q.25 Describe the process of programming a robot using Arduino and give an example of a simple pick and place operation. (CO5)

a) Hydraulic actuator b) Pneumatic actuator

c) Electric actuator d) Thermal actuator

Q.5 Which sensor is used for measuring position in a robot? (CO4)

a) Proximity sensor b) Encoder

c) Tachometer d) Ultrasonic sensor

Q.6 Identify the programming environments is used with Arduino? (CO5)

a) Tinker CAD b) MATLAB

c) Simulink d) AutoCAD

SECTION-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Define the function of a teach pendant in robotics.(CO5)

Q.8 Name one industrial application of robots. (CO1)

Q.9 Explain what a robot end effector is. (CO2)

Q.10 List two types of robotic sensors. (CO4)

Q.11 What is the purpose of an encoder in a robotic system? (CO1)

Q.12 Name one type of electric actuator. (CO3)

SECTION-C

Note: Short answer type Questions. Attempt any eight questions out of ten Questions. (8x4=32)

Q.13 What are the various types of robot configurations, and how do they differ in terms of work volumes? (CO2)

Q.14 Discuss the difference between revolute and prismatic joints in robotic arms. (CO2)

Q.15 How does a vacuum gripper work and where is it used? (CO2)

Q.16 What are the benefits and drawbacks of using hydraulic actuators? (CO3)

Q.17 Explain the working of a proximity sensor in a robot. (CO4)

Q.18 Describe the steps involved in operating a robot using teach pendant programming. (CO5)

Q.19 What is the significance of selecting the correct degrees of freedom in a robot? (CO2)

Q.20 Explain the difference between Cartesian mode and Joint mode in robot operation. (CO5)

Q.21 What role do micro controllers like Arduino play in robotic programming? (CO5)

Q.22 What are the components of a vision system in robotics and how do they interact with the environment? (CO4)