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3rd Sem / Automation & Robotics

Subject : Robotics

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 Which motor is typically used in precise positioning in robotics? (CO2)

a) AC motor b) DC motor

c) Stepper motor d) Universal motor

Q.2 The component responsible for robot motion is (CO1)

a) End-effector b) Sensor

c) Actuator d) Controller

Q.3 Which robot configuration has a cylinder work envelope? (CO2)

a) SCARA b) Cartesian

c) Polar d) Cylindrical

Q.22 Write a short program for Arduino to blink 3 LEDs in sequence. (CO5)

SECTION-D

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

Q.23 Compare and contrast various actuator types used in robotics with their applications. (CO3)

Q.24 Explain the complete process of robot programming using Arduino and TinkerCAD. (CO5)

Q.25 Discuss the interfacing and use of ultrasonic sensors in Arduino with a sample code. (CO4)

Q.4 LVDT is used to measure (CO4)

a) Speed b) Temperature

c) Displacement d) Pressure

Q.5 SCARA robot configuration is best suited for (CO1)

a) Painting

b) Arc welding

c) Pick and place operations

d) Drilling

Q.6 PWM in motor control stands for (CO4)

a) Pulse Width Measurement

b) Power Watt Management

c) Pulse Width Modulation

d) Parallel Wave Modulation

SECTION-B

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

Q.7 What is a teach pendant used for? (CO5)

Q.8 List two types of robot configurations. (CO2)

Q.9 Mention any two applications of industrial robots. (CO1)

Q.10 What is work volume in robotics? (CO2)

Q.11 State any one application of proximity sensors. (CO4)

Q.12 What is the purpose of a homing? (CO5)

SECTION-C

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

Q.13 Explain Cartesian and SCARA robot configurations. (CO1)

Q.14 Describe adhesive and mechanical grippers with examples. (CO2)

Q.15 Discuss the advantages of electric actuators. (CO3)

Q.16 Explain how a tachometer is used in robotics. (CO4)

Q.17 Differentiate between internal and external sensors with examples. (CO4)

Q.18 List and describe any four applications of robots in industry. (CO1)

Q.19 Describe joint mode and Cartesian mode in teach pendants. (CO5)

Q.20 Discuss the elements of a vision system. (CO4)

Q.21 Explain selection criteria for actuators in robotic systems. (CO3)