1129
B. E. (Mechanical Engineering)
Fifth Semester
MEC-503: Robotics

Time allowed: 3 Hours   Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I.   Attempt the following:-

a) What is LSPB-l and LSPB-2?

b) What is SCARA?

c) What is working principle of torque sensor?

d) What are manipulator parameters?

e) What is inverse kinematics of Robot?   (5x2)

UNIT – I

II.   a) Explain four configuration of robot arm with the help of neat sketches.

b) Write industrial applications of Robot.   (2x5)

III.   a) Describe robot end effectors. Explain operation of mechanical grippers.

b) What do you understand by robot workspace? Draw the workspace for cylindrical and spherical robot arms.   (2x5)

IV.   a) Explain Ultrasonic proximity sensor working principal and its application.

b) How range sensor works? Explain its application in defence.   (2x5)

UNIT – II

V.   The path traced by a joint of a robot .manipulator is described by the fifth degree 10 polynomial. The joint has to star from an initial angle of 10° to 20°. The starting acceleration and the ending deceleration 2 deg. /sec². The velocities being zero, find the equation of motion for joint. The range is covered in 2 seconds.   (10)

VI.   a) Explain robotic vision with block diagram.

b) Explain analogue to digital conversion techniques step by step.   (2x5)

VII.   Write program and also draw flowchart to palletize the object in VAL commands.
                                                                                   (10)

x-x-x