E

1. (a) Explain forward transformation and reverse transformation of robot manipulator with 3 degrees of freedom.   CO1- U   (20)

Or

    (b) Explain the main Robot anatomy with neat sketch.   CO1- U   (20)

2. (a) (i) What are the different actuators used in the robots? Describe them briefly.   CO2- U   (10)

         (ii) Explain the working of a stepper motor.   CO2- U   (10)

Or

    (b) With a neat sketch explain the working of any two robot actuator.   CO2-U   (20)

3. (a) Explain the various techniques in Image Processing and Analysis.   CO3-U   (20)

Or

    (b) (i) Describe the methods of template matching.   CO3-U   (10)

         (ii) Describe a sensing device to generate the contour pictures of a workshop.   CO3-U   (10)

4. (a) With examples, explain the industrial applications of robots.   CO4- U   (20)

Or

    (b) Explain the robot work cell arrangements with simple sketch.   CO4- U   (20)

5. (a) List the commands used in VAL II programming and describe its functions.   CO5- U   (20)

<center>Or</center>

   (b) Write extensively on AI Problem reduction and solution.   CO5- U   (20)

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