Printed Pages—3   **EOE084**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2953 Roll No. ☐☐☐☐☐☐☐☐☐

B. Tech.

(SEM. VIII) THEORY EXAMINATION 2011-12
AUTOMATION AND ROBOTICS

Time : 3 Hours   *Total Marks : 100*

Note :– (i) Attempt **all** questions.

(ii) Be precise in your answer.

1. Attempt any **two** parts of the following :   **(10×2=20)**

    (a) Differentiate between ROBOT and ROBOTICS.

    (b) Distinguish between open loop and close loop control system used for Robotic control.

    (c) Explain the following technical features of an industrial robot :

    (i) Work volume

    (ii) Precision of movement

    (iii) Type of drive system

    (iv) Speed of movement.

2. Answer any **four** parts of the following :   **(5×4=20)**

    (a) Draw a neat schematic diagram of robotic configurations :

    (i) Polar co-ordinate configuration

    (ii) Jointed arm configuration.

(b) Discuss the benefits that result from the application of robot technology.

(c) How do robots differ from other capital equipments used in industries for production of articles ?

(d) What do you mean by robot arm kinematics ? Differentiate between Direct kinematics and Inverse kinematics.

(e) List and explain in brief the control functions of a 'teach box'.

3. Attempt any **two** parts of the following :   **(10×2=20)**

(a) With the help of suitable sketches, show the PTP, linear and contouring control of a robot.

(b) Classify different sensors and actuators used in robotics.

(c) What are the basic design requirements of robot for the following tasks :

(i) Spray painting

(ii) Workpiece handling.

4. Attempt any **two** parts of the following :   **(10×2=20)**

(a) What do you mean by robotics control system ? Write advantages, disadvantages and limitations of robotic controls.

(b) Differentiate among the following methods of robot programming :

(i) Lead through teaching

(ii) Walk through teaching

(iii) Off-line programming.

(c) Give a systematic procedure for planning and implementing a robotized project.

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5. Attempt any **two** parts of the following : **(10×2=20)**

    (a) Define and explain the following terms used w.r.t. a robot : Accuracy, Work Volume, Resolution, Repeatability and Speed of Movement.

    (b) How will you determine the position and orientation of end effectors ? Explain.

    (c) What do you mean by adaptive control system of Robots ? Write advantages, disadvantages and limitations of Adaptive controls.

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