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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.

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(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.