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B. TECH.

THEORY EXAMINATION (SEM–VIII) 2016-17

AUTOMATION & ROBOTICS

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

1 **Explain the following:** **(10×2=20)**

a) What are the kinematics chains?

b) List some of the important reasons for using robots instead of human to perform a task.

c) What is program synthesis?

d) State the types of joints commonly used in industrial robots.

e) What is adaptive control?

f) State advantages of rectangular co-ordinates.

g) How to select robotic drive? Discuss.

h) Discuss the applications of robotic system in assembly line.

i) Comment on geometric classification.

j) What do you understand by robot vision?

SECTION-B

2 **Attempt any five of the following:** **(10×5=50)**

a) Describe about parallel actuated and closed loop manipulators.

b) What are the various levels of robot programming?

c) What do you understand by robot coordinate system representation?

d) Differentiate between external and internal sensors with suitable examples in support.

e) Discuss various types of power sources used in robots. Also detail their relative merits and demerits.

f) List relevant factors that must be considered for robotic applications in gripping operation.

g) Discuss the process of digitization in detail.

h) Discuss the general characteristics of industrial work situations that tend to promote the substitution of robots for human labour.

SECTION-C

Attempt any two of the following: **(15×2=30)**

3 Discuss the difference between feed-back control and adaptive control. Differentiate between ACO and ACC types of adaptive control.

4 Sketch and describe the working of a Wrist mechanism with 2 degrees of freedom.

5 Give a list of factors that should be considered while evaluating a robot for welding capabilities. Give suitable explanations in support of your answer.