Printed Pages-2 **NME-044**

B.Tech.

(SEM. VII) REGULAR THEORY EXAMINATION 2016-17

AUTOMATION & ROBOTICS

Time : 3 Hours *Total Marks : 100*

Note: Attempt all questions as directed.

Section-A

1. Attempt **all** parts. Define the following. (10x2=20)
   a) Transfer line
   b) Coordinate measuring machine
   c) Machine vision system
   d) Robots
   e) Assembly operation
   f) Adaptive control
   g) Computed torque control
   h) Kinematic chains
   i) Robot vision
   j) Homogeneous transformation

Section-B

2. Attempt any **five** parts : **(5×10=50)**

a) How automation affect quality? Support your answer with suitable example.
b) Differentiate between hard automation and flexible automation.
c) What do you understand by assembly line? Compare multi-station assembly machine and single stage assembly machine
d) Define different types of sensors. How do photoelectric sensors work?
e) What is the difference between the system with AGVs, Robots or Conveyers from transfer line?
f) Write down the different configurations for robots having six degree of freedom.
g) What are the differences between an instructional robot and industrial robot?
h) Explain with suitable reasons whether part symmetry helps or hinders automation.

Section-C

Attempt **any two** questions. (2x15=30)

3. Attempt the following

a) What are the different ways of controlling point to point motion independently?
b) All robots have some essential basic components, what are those components?

4. Attempt the following

a) What is Artificial Intelligence (AI)? How is it useful in advancement in robotics?
b) Describe the principal motivation for using industrial robots in machine loading and unloading.

5. Attempt the following

a) Explain the working principle of automated storage and retrieval system.
b) What are the basic premises for the selection of material handling system suitable for different layout?