

B.Tech Sem – VIII (2007 Course) (Production Engg.) :
WINTER - 2017
SUBJECT : ELECTIVE – II : INDUSTRIAL ROBOTICS

Day : **Wednesday**
Date : **22/11/2017**

Time **02.30 PM TO 05.30 PM**
Max. Marks : **80**

W-2017-2697

N.B.

- 1) **Q.1 and Q.5 are COMPULSORY.** Out of the remaining attempt any **TWO** questions from each Section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.

SECTION – I

- Q.1**
- a) Explain with neat sketch elements of a robot cell configurations. **(05)**
 - b) What is kinematics? Explain forward and inverse kinematics. **(05)**
 - c) Explain any two types of grippers used in robotics for pick and place activity. **(04)**
- Q.2**
- a) How do you specify a Robot? Distinguish between accuracy and repeatability with neat sketch. **(07)**
 - b) Explain with neat sketch polar and cylindrical configuration of robot with its advantages, limitations and application. **(06)**
- Q.3**
- a) Discuss suitable design of robots drive system to move objects like. **(07)**
i) Ring (R) ii) Flanges (FL) iii) Flat sheet (FS) (R) v) Shaft (S).
Consider the weight hierarchy of objects as $W_{\text{BOX}} > W_{\text{FS}} > W_{\text{FL}} > W_{\text{S}} > W_{\text{R}}$.
 - b) Explain any two methods used in designing the kinematic behaviour of the robot.
- Q.4**
- a) How do you interpret the following terms with vision system of robot? **(07)**
i) Segmentation ii) Feature Extraction iii) Recognition iv) Interpretation and scene understanding.
 - b) What is sensor? Explain the types of sensor used by the robot working in flexible manufacturing system. **(06)**

SECTION – II

- Q.5**
- a) What is robot programming? Explain any one method of robot programming with its limitations. **(05)**
 - b) With suitable sketch explain the interfacing of robot with a computer. Explain social and economical impact of robotics. **(05)**
 - c) Explain effective use of AI for robot efficiency. **(04)**
- Q.6**
- a) Explain with suitable example the generations of robotics. Today robots are in which generation, justify. **(07)**
 - b) Explain with example Trajectory control using VAL robot programming. **(06)**
- Q.7**
- a) Elaborate similarities and difference in robotics assembly, inspection, material handling operations with respect to elements involve in the robotics. **(07)**
 - b) Explain with suitable diagram the interface and control of robot with hardware system. **(06)**
- Q.8**
- a) Explain with neat sketch how is information transferred for control of the telerobots. **(08)**
 - b) Discuss the features of legged robots. Give the applications of such robots with suitable example. **(05)**

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