Total number of printed pages–2

53 (IT 813) RBCV

2018

ROBOTICS AND COMPUTER VISION

Paper : IT 813

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. What are the various image representation techniques ? What are the various image capturing devices ? Discuss with examples. 20

2. *(a)* What are the various color models ? How conversion from one model to another model is done ? Explain with example. 10

   (b) Define and explain image sliding and image stretching. 10

Contd.

3. *(a)* With usual notations and symbolic sketch, derive a composite transformation matrix for rotation about any arbitrary axis. 10

(b) Using D-H method and by a neat sketch obtain the displacement matrices for a typical anthropomorphic arm configuration considering all the link/joint variables and parameters. Also obtain the position and orientation of the EE/Wrist with respect to the base coordinate frame. 10

4. *(a)* Define trajectory planning and discuss how it is done in case of a PTP robot considering modified constant velocities motion. 10

(b) Explain the Lagrange-Euler formation for a robotic system. 10

5. What is feature extraction ? Explain in details about various edge detection techniques. 20

6. Write short notes on : 2×10=20

(a) Direct and Inverse Kinematics

(b) Convolution and Filtering.
