

# Robotics in medicine

CON 7607-12

YTIET/LIB/ENG/G/ BM / SEM - VIII / RM / 29 may 2012

GN-8393

(Revised Course)

(3 Hours)



Total Marks: 100

N.B.(1) Question No.1 Is Compulsory

(2) Attempt any four questions out of remaining Six.

(3) Assume Suitable data whenever required.

Que.1 (a) Compare Area descriptor and Line descriptor. (5)

(b) What is tool Configuration Vector explain with example. (5)

(c) What is meant by Grasp Planning Problem explain with Example.(5)

(d) Compare the different drive technology used in Robotics (5)

Que2. (a) Explain the work space analysis of a four axis SCARA robot.(10)

(b) Explain pick and place trajectory in details. (10)

Que3.(a) What are template matching techniques of gray level image and their application to Robot vision. (10)

b) Explain the PNP motion trajectory in details (10)

Que4 (a) Compare the merits and demerits of various Illumination techniques used in robotics (10)

(b) Find the arm matrix for four axis SCARA Robot (ADEPT.ONE)(10)

Que5 (a) Explain the shrink and swell operator (06)

(b) Develop IK analysis of Rhino XR-3 Robotics arm (14)

Que6 (a) Explain D-H Algorithm. (10)

(b) Explain the four fundamental operation to transfer (k-1) frame to k frame .

Hence obtain  $T_{k-1}^k$  transformation matrix. (10)

Que7. Write a short note on: (20)

- a) Region Growing
- b) Task Planning Problem
- c) Bounded deviation Algorithm
- d) Perspective transformation