

7E7017

Roll No. _

Total No of Pages: **3****7E7017****B. Tech. VII Sem. (Main / Back) Exam., Nov. – Dec. - 2018****Mechanical Engineering****7ME6.2A Robotics****Common with ME, PI****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 26****Instructions to Candidates:**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL2. NIL**UNIT- I**

Q.1 (a) What do you mean by robotics. Explain in detail laws of robotics. [8]

(b) What is progressive advancement in robotics? Explain. [8]

OR

Q.1 (a) What do you understand by human arm characteristics of robot. [8]

(b) With the help of neat sketch, explain the manipulation and control of robots. [8]

UNIT- II

Q.2 (a) Describe the robot configuration with neat sketches. [8]

(b) What do you mean by transforms? Explain the inverting homogeneous transform. [8]

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OR

- Q.2 (a) Give the description of objects in space. [8]
(b) Explain the transformation of vectors. [8]

UNIT- III

- Q.3 (a) Explain Denavit – Hartenberg convention with neat sketches. [8]
(b) Derive inverse kinematic equations of manipulator for a particular position. [8]

OR

- Q.3 (a) Explain the cooperation and interaction between human and humanoid robots. [8]
(b) What do you mean by manipulator transformation Matrix? [8]

UNIT- IV

- Q.4 (a) Explain the role of sensors in robotics. Give classification of sensors. [8]
(b) Explain application of any one sensor in robot with neat sketch in detail. [8]

OR

- Q.4 (a) Explain the applications of vision – controlled Robotics system. [8]
(b) Explain the principle of the term "Image Processing". [8]

UNIT- V

- Q.5 (a) Write short notes on:
(i) Robot safety. ersahilkagyan.com [5]
(ii) Non – industrial application of robots. [5]
(iii) Inspection application of robots. [6]

OR

Q.5 (a) Explain material handling applications of robots in industry in detail.

[8]

(b) How is programming in robot done? Explain.

[8]
