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Roll No. : .....

**337831(37)**

**B. E. (Eighth Semester) Examination, April-May 2021**

**(New Scheme)**

**(Mechanical Engg. Branch)**

**ROBOTICS**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Part (a) is compulsory from each unit.***

***Attempt any one part from (b) and (c) in  
question no. 2 to 5.***

**Unit-I**

1. (a) What do you mean by Robot? 2

**Attempt any two :**

(b) Explain wrist and effector term used in robotics.

Also draw diagram. 7

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- (c) Explain progressive advancements in robotics. 7
- (d) Explain future prospects in robotics. 7

**Unit-II**

- 2. (a) Define Coordinate frame. 2
- (b) Derive manipulator transformation matrix used in robotics. 14
- (c) Explain D-H Nations. 14

**Unit-III**

- 3. (a) Define manipulator workspace. 2
- (b) Explain with sketch reachable and dexterous workspace of the 3-DOF planar manipulator. 14
- (c) Explain Jacobian matrix step by steps. 14

**Unit-IV**

- 4. (a) Define meanings of sensor for robot. 2
- (b) Explain vision controlled robotics system with application. 14

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- (c) Explain image acquisition and image processing system with diagram. 14

**Unit-V**

- 5. (a) Define trajectory planning of robotics. 2
- (b) Explain non-industrial applications of robot with examples. 14
- (c) How you justify the robot? Explain with case study examples. 14