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 **Reg. No. :**

**Question Paper Code: 49075**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Elective

Mechanical Engineering

14UME924-ROBOTICS

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. \_\_\_\_\_\_ is an automatically controlled, reprogrammable, multipurpose manipulator

 programmable in three or more axes.

 (a)SCARA Robot (b)Manipulator (c) Yaw (d)Industrial Robot

2. The device with hardware & software support for giving commands to the drives called

 (a)Controller (b)Sensor (c)Base (d)Actuator

3. The \_\_\_\_\_\_\_ must not create any sort of distort and scratch in the fragile work parts

 (a)Path control (b)Hydraulic drives (c) Tools (d)Gripper

4. The body , arm and wrist assembly is sometimes called

 (a)End effector (b)Manipulator (c)Anatomy (d)Sensors

5. \_\_\_\_\_\_\_\_\_\_ is concerned with the construction of the body, arm & wrist of machine.

 (a)Cylindrical Configuration (b)Pitch (c)Robot anatomy (d)Gripper

6. The work envelop is described by the surface of the

 (a)Work volume (b)Work Done (c) Work space (d)Sensor

7. The amount of time required for the work cycle is

 (a)Robot cycle time analysis (b)Robot time (c)Cell timing (d)Machine cycle time

8. The robot which is located at the approximate center of the cell is called

 (a)Machine cell (b)Robot centered work cell

 (c)Celll ayout (d)DataInterpretation

9. The system used to move parts in the cell

 (a)Intermittent transfer (b) synchronous transfer

 (c)Continuous transfer (d)In-Line transfer

10. The device with hardware & software support for giving commands to the drives called

 (a)Controller (b)AGV (c)Base (d)Tool

PART - B (5 x 2 = 10 Marks)

11. What is meant by Work space?

12. List out some examples of Robot End Effector.

13. Name some feedback devices used in robotics.

14. Define work cell.

15. What are the commercially available industrial robot?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain with a neat Sketch about the four basic robot configurations classified

 according to the coordinate system. (16)

Or

 (b) (i) Elaborate the various parts of a robot and its anatomy with neat sketch. (10)

 (ii) Function th[e types of joints used in robots.](http://5starnotes.com/) (6)

17. (a) (i) Discuss the various types of Gripper mechanisms. (8)

 (ii) Write note on Gripper selection and design. (8)

Or

 (b) Explain the various drive system used with an industrial robot and compare their

 features, merits and demerits. (16)

18. (a) Illustrate and explain the working principle of Proximity sensors with neat

 sketch. (16)

 Or

 (b) Explain the [various techniques in Image Processing and Analysis.](http://5starnotes.com/) (16)

19. (a)Experiment with an example which differentiates forward and inverse kinematics.(16)

Or

 (b) Construct the forward and reverse transformation of 2-Degree of freedom and 3-

 degree of freedom arm. (16)

20. (a) Define and explain AGV & RGV types of robots in detail. (16)

Or

 (b) Enumerate [the Safety sensors and safety monitoring of Robots in detail.](http://5starnotes.com/)  (16)