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Question Paper Code	12610
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024**

Sixth Semester

**Artificial Intelligence and Data Science**

**20AIPC601 – ROBOTICS PROCESS AUTOMATION**

Regulation – 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

	Marks	K- Level	CO
1. List out the types of Robots.	2	K1	CO1
2. Mention few Components of RPA.	2	K1	CO1
3. Choose the best practices for naming variables.	2	K2	CO2
4. Give the importance of grippers, tool changers, and other tooling components in assembly automation systems.	2	K2	CO2
5. Outline the types of Recording Methods in RPA.	2	K1	CO3
6. List the benefits of Keyboard based Automation in RPA.	2	K1	CO3
7. Analyse the application of velocity and accelerator sensor in Robotics.	2	K2	CO4
8. Examine how range finders are used to measure distances and detect objects within a specified range in robotic navigation.	2	K2	CO4
9. Investigate the role of robots in medical applications.	2	K2	CO6
10. Mention the industrial applications of robots in various sectors.	2	K2	CO6

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) With the help of a neat sketch explain the basic components of a robot connected as a system. 13 K2 CO1

**OR**

b) Discuss the evolution and significance of robots in the realm of automation, highlighting their role in modern industries and the advancements they bring to various sectors. 13 K2 CO1

12. a) How would you utilize the user interface of an RPA tool to design and execute an automated workflow for a specific business process? 13 K2 CO2

**OR**

b) Explain different variables available in RPA variables panel. 13 K2 CO2

13. a) Explain the process of screen scraping in RPA, detailing the steps involved in extracting data from various applications and interfaces. 13 K2 CO3

**OR**

- b) Discuss the importance of data manipulation techniques in RPA, focusing on their role in cleaning, transforming, and organizing data for automation tasks. 13 K2 CO3

14. a) Investigate the principles of operation and applications of ultrasonic sensors in robotics also discuss the advantages and limitations of ultrasonic sensors. 13 K2 CO4

**OR**

- b) Compare and contrast different actuating systems used in robotics, including pneumatic, hydraulic, and electric actuators. 13 K2 CO4

15. a) Investigate the emerging medical robots and its potential applications in various hospitals. 13 K2 CO6

**OR**

- b) Analyze the integration of robotics and automation technologies in the context of Industry 4.0. 13 K2 CO6

**PART - C (1× 15 = 15 Marks)**

16. a) Describe in detail about Trajectory Planning for robot manipulators in industry 4.0. 15 K2 CO5

**OR**

- b) Explain the mathematics behind inverse kinematics of two degrees of freedom robot arm. 15 K2 CO5