

GUEE201
Common for UG Programs
I Semester Examination, February 2023
Basics of Robot Design
Choice Based Credit System (CBCS)

Duration: 3 Hrs.**Maximum Marks: 60****Minimum Pass Marks: 24**

- Note:* (1) All questions carry equal marks, out of which part 'A' and 'B' carry 3 marks and part 'C' carries 6 marks.
(2) From each question, part 'A' and 'B' are compulsory and part 'C' has internal choice.
(3) Draw neat diagram, wherever necessary.
(4) Assume suitable data wherever necessary.

- Q.1.(A)** Define Robotics. Also, list out six areas where robots can be utilized. **03**
(B) Discuss three laws of Robotics. **03**
(C) Describe different component of Robot in detail. **06**

OR

Describe various types of Robots.

- Q.2.(A)** Describe the need of Sensors in Robotics. Elaborate your view with the help of an example. **03**
(B) Classify sensors on the basic of working principle. **03**
(C) With the help of neat diagram, explain working of Sonar Sensor. **06**

OR

With the help of neat diagram, explain working of Sharp IR distance Sensor.

- Q.3.(A)** Define Actuator. Describe the need of Actuators in Robotics. **03**
(B) Draw neat diagram of a Hydraulic Actuator. **03**
(C) Explain the functioning of L293D (H-Bridge controller) with the help of neat diagram. **06**

OR

With the help of neat diagram explain functioning of DC and Servo motor.

- Q.4.(A)** Describe the features of Arduino board. **03**
(B) Describe the basic structure of an Arduino program. **03**
(C) Explain the following functions- **06**
(i) pinMode (ii) digitalWrite (iii) digitalWrite
(iv) analogRead (v) analogWrite (vi) delay

Contd.....

OR

Write the short note on following data types supported by Arduino with the help of an example

- | | | |
|-----------|------------|-------------------|
| (i) int | (ii) char | (iii) float |
| (iv) long | (v) double | (vi) unsigned int |

- Q.5.(A)** Draw the block diagram for interfacing LED, Switch and IR Sensor with Arduino board. **03**
- (B)** Write down the Arduino code for LED control using an IR sensor (Whenever an obstacle passes through IR sensor, it generates a high signal), also draw block diagram for this interface. **03**
- (C)** With the help of neat interfacing diagram, explain line following robot. **06**

OR

Write down the Arduino code for distance measurement through SONAR sensor.

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