

**SERIES: A**



**QP CODE: 24900087**

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**Reg No:.....**

**Name:**.....

## MAHATMA GANDHI UNIVERSITY, KOTTAYAM

**FIRST SEMESTER MGU-UGP (HONOURS)****REGULAR EXAMINATION NOVEMBER 2024**

## First Semester

**Multi-Disciplinary Course – MG1MDCECC100, MG1MDCECT104**

## CREATIVE ROBOTICS

(2024 ADMISSION ONWARDS)

Duration: 1 Hours

Maximum Marks: 35

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Interest (I),  
Appreciation (Ap), and Skill (S)**

*Students should attempt atleast one question from each course outcome to enhance their overall outcome attainability.*

[Learning Domain][CO No(s)]

## Part A

### Multiple Choice Questions

Answer any 35 questions.

Each question carries 1 mark

- |   |   |  |     |
|---|---|--|-----|
| 1 | Identify which component is the "brain" of the Arduino board. | [U]  | [1] |
|   | a) Power supply   | b) Voltage regulator                                 |     |
|   | c) Microcontroller  | d) USB port  |     |
| 2 | Relate the purpose of the "Vin" pin on the Arduino board.     | [U]  | [1] |
|   | a) To supply 3.3V to external components                      | b) To provide an external power source for the board |     |
|   | c) To interface with I2C devices                              | d) To reset the microcontroller                      |     |
| 3 | Which port is used to upload code to the Arduino board?       | [K]  | [1] |
|   | a) Ethernet port  | b) USB port  |     |
|   | c) Serial port  | d) HDMI port   |     |

## SERIES: A

- 4 Identify the function of the RX pin on Arduino Uno. [U] [1]
- a) To send digital data                      b) To receive serial data  
c) To read analog signals                  d) To reset the microcontroller
- 5 Relate the Arduino IDE to its primary purpose. [U] [1]
- a) To create websites                      b) To compile, upload, and manage Arduino sketches  
c) To monitor temperature sensors      d) To control external devices
- 6 Identify the correct syntax to set pin 13 as an output in Arduino. [U] [1]
- a) pinMode(13, INPUT);                      b) pinMode(13, OUTPUT);  
c) pinMode(13, INPUT\_PULLUP);              d) pinMode(13, ANALOG);
- 7 Identify the correct syntax to set pin 3 as an output in Arduino. [U] [1]
- a) pinMode(3, INPUT);                      b) pinMode(3, OUTPUT);  
c) pinMode(3, INPUT\_PULLUP);              d) pinMode(3, ANALOG);
- 8 Which tool is used to write and upload code to Arduino boards? [K] [1]
- a) Python IDE                                  b) Arduino IDE  
c) Code::Blocks                                d) Visual Studio
- 9 If you connect an LED to pin 2 and use digitalWrite(2, LOW);, what would you expect to see if the LED was previously on? [U] [2]
- a) The LED will blink                      b) The LED will turn off  
c) The LED will turn on                      d) Nothing will happen
- 10 What will the following code do? pinMode(9, OUTPUT); digitalWrite(9, LOW); [U] [2]
- a) Pin 9 outputs 5V                              b) Pin 9 outputs 0V  
c) Pin 9 will output 3.3V                      d) Pin 9 will read input voltage
- 11 PWM in Arduino is used to simulate which type of signal? [U] [2]
- a) LED ON and OFF                              b) Pure analog signal  
c) Pure digital signal                              d) Analog signal using digital output
- 12 What is the range of values that can be written using the analogWrite() function? [K] [2]
- a) 0 to 1000                                      b) 1 to 100  
c) 0 to 10    d) 0 to 255
- 13 How would you calculate the output voltage of a voltage divider with resistances  $R_1 = 10\text{k}\Omega$  and  $R_2 = 10\text{k}\Omega$ , and input voltage = 12V? [U] [2]
- a) 4V    b) 6V  
c) 8V    d) 3V

**SERIES: A**

- 14 What voltage corresponds to a reading of 512 from analogRead() on a 5V Arduino? [U] [2]

  - a) 1.25V
  - b) 2.5V
  - c) 5V
  - d) 3.3V

15 How would increasing the baud rate from 9600 to 115200 affect the speed and reliability of data transmission in a noise-prone environment? [U] [2]

  - a) Speed increases but reliability decreases in noisy environments.
  - b) Both speed and reliability improve.
  - c) The speed decreases, but the transmission becomes more stable.
  - d) There is no impact on either speed or reliability.

16 Which of the following is the correct way to print text data on the serial monitor in Arduino? [U] [2]

  - a) Serial.print("Hello");
  - b) Serial.display("Hello");
  - c) Serial.show("Hello");
  - d) Serial.write("Hello");

17 Which statement correctly initializes a for loop in Arduino to run 10 times? [U] [1]

  - a) for (int i = 0; i <= 11; i++)
  - b) for (int i = 1; i <= 9; i++)
  - c) for (int i = 0; i < 10; i++)
  - d) for (int i = 1; i < 9; i++)

18 "In the following code, what is the value of i when the loop terminates?  
for (int i = 0; i < 4; i++) {  
  // Do something  
}" [U] [1]

  - a) 3
  - b) 4
  - c) 5
  - d) 2

19 Which of the following is the correct syntax for a while loop in Arduino? [U] [1]

  - a) while i < 5 { // Do something }
  - b) while (i < 5) { // Do something }
  - c) while (int i < 5) { // Do something }
  - d) while (i > 5); { // Do something }

20 Which of the following correctly increments the loop variable i inside a while loop? [U] [1]

  - a) i + 1;
  - b) i = i + 1;
  - c) i++;
  - d) Both B and C

21 What will happen if you connect an LED directly between a digital pin and ground without a resistor? [U] [1]

  - a) The LED will work fine
  - b) The LED will not light up
  - c) The LED may burn out
  - d) The Arduino board will stop working

## SERIES: A

- 22 How do you gradually increase the brightness of an LED using Arduino? [U] [1]
- a) Use `analogWrite()` to adjust the duty cycle      b) Use `digitalWrite()` to set pin states repeatedly  
c) Change the resistor value dynamically      d) Use `pinMode()` to adjust brightness
- 23 When does the code inside the `setup()` function run? [U] [1]
- a) Every time the program loops      b) Only once when the Arduino board starts up or resets  
c) Continuously until stopped      d) Before every loop iteration
- 24 How do you initialize multiple pins as outputs in a single line in Arduino? [U] [1]
- a) `pinMode(8, 9, OUTPUT);`      b) `pinMode(8, OUTPUT);`  
c) `initialize(8, 9, OUTPUT);`      d) `multiPinMode(OUTPUT, 8, 9);`
- 25 In Arduino, what default unit is the `delay()` function measured in? [K] [1]
- a) Milliseconds      b) Seconds  
c) Minutes      d) Microseconds
- 26 Which of the following is a correct syntax in Arduino programming? [K] [1]
- a) `delay(1000);`      b) `Delay(1000);`  
c) `delay:1000;`      d) `delay;1000;`
- 27 What is the role of '`int i = 0`' in a FOR loop? [K] [1]
- a) Declares and initializes a variable      b) Specifies the loop condition  
c) Increments a variable      d) Declares a constant
- 28 Which of the following is true about a FOR loop in Arduino? [U] [1]
- a) Executes a set number of times      b) Can run infinitely  
c) Cannot be used with `delay()`      d) Runs only once
- 29 What type of waves does an ultrasonic sensor emit? [K] [2]
- a) Radio waves      b) Ultrasonic waves  
c) Electromagnetic waves      d) Sound waves
- 30 How is the distance calculated using the time taken by the sound wave? [K] [2]
- a)  $\text{Distance} = \text{Speed} * \text{Time}$       b)  $\text{Distance} = \text{Time} / \text{Speed}$   
c)  $\text{Distance} = \text{Speed} / \text{Time}$       d)  $\text{Distance} = \text{Time} * \text{Speed} * 2$
- 31 Which of the following can cause inaccurate readings in ultrasonic sensors? [K] [2]
- a) Soft surfaces      b) Hard surfaces  
c) Distance      d) Smooth surfaces

## **SERIES: A**

- 32 What happens if `pinMode(echoPin, OUTPUT)` is used for the Echo pin? [K] [2]  
a) It will correctly set the Echo pin      b) It will cause a syntax error  
c) It will generate incorrect readings      d) Nothing will happen
- 33 Which pin on an MQ2 sensor outputs analog data? [U] [2]  
a) D0      b) A0  
c) GND      d) VCC
- 34 What precaution should be taken when using an IR flame sensor? [U] [2]  
a) Avoid using it with digital systems      b) Protect it from heat exposure  
c) Do not use it near visible light      d) Expose it to sunlight for accurate readings
- 35 What does LDR stand for? [U] [2]  
a) Light Delay Resistor      b) Light Developing Resistor  
c) Light Driving Resistor      d) Light Dependent Resistor
- 36 What is the function of a relay in an Arduino-LDR circuit? [U] [2]  
a) To measure resistance      b) To control high voltage devices  
c) To decrease voltage      d) To lower resistance
- 37 What type of motor is used in precise control of angle? [U] [2]  
a) DC Motor      b) AC Motor  
c) Servo Motor      d) Stepper Motor
- 38 How many degrees of rotation can most standard servo motors achieve? [U] [2]  
a) 0°-90°      b) 0°-180°  
c) 0°-270°      d) 0°-360°
- 39 What does the L298N motor driver control? [U] [2]  
a) Voltage      b) Current  
c) Speed      d) Power
- 40 What is the correct method to stop a DC motor using an L293D driver? [U] [2]  
a) `digitalWrite(pin, LOW);`      b) `analogWrite(pin, LOW);`  
c) `analogWrite(pin, OFF);`      d) `motorControl(pin, STOP);`

(35 × 1 = 35)

**END OF THE QUESTION PAPER**

**\*\*\***

**SERIES: B**



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**Part A**

Multiple Choice Questions

Answer any 35 questions.

Each question carries 1 mark

- 1      What type of motor is used in precise control of angle?      [U]   [2]  

a) AC Motor

b) Servo Motor

c) Stepper Motor

d) DC Motor
- 2      Which of the following is a correct syntax in Arduino programming?      [K]   [1]  

a) delay(1000);

b) delay:1000;

c) delay;1000;

d) Delay(1000);
- 3      If you connect an LED to pin 2 and use digitalWrite(2, LOW);, what would you expect to see if the LED was previously on?      [U]   [2]  

a) The LED will blink

b) Nothing will happen

c) The LED will turn on

d) The LED will turn off

## SERIES: B

- 4 Relate the Arduino IDE to its primary purpose. [U] [1]  
a) To control external devices b) To create websites  
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- 5 Identify the correct syntax to set pin 13 as an output in Arduino. [U] [1]  
a) `pinMode(13, ANALOG);` b) `pinMode(13, OUTPUT);`  
c) `pinMode(13, INPUT_PULLUP);` d) `pinMode(13, INPUT);`
- 6 PWM in Arduino is used to simulate which type of signal? [U] [2]  
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c) `while i < 5 { // Do something }` d) `while (i > 5); { // Do something }`
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a) `analogWrite(pin, OFF);` b) `digitalWrite(pin, LOW);`  
c) `motorControl(pin, STOP);` d) `analogWrite(pin, LOW);`
- 9 What is the range of values that can be written using the `analogWrite()` function? [K] [2]  
a) 0 to 255 b) 0 to 1000  
c) 1 to 100 d) 0 to 10
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a) Do not use it near visible light b) Protect it from heat exposure  
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	a) Both B and C	b) <code>i = i + 1;</code>	
	c) <code>i + 1;</code>	d) <code>i++;</code>	
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	c) <code>pinMode(8, OUTPUT);</code> <code>pinMode(9, OUTPUT);</code>	d) <code>initialize(8, 9, OUTPUT);</code>	
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	a) Code::Blocks	b) Python IDE	
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	a) HDMI port	b) Serial port	
	c) Ethernet port	d) USB port	
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	a) There is no impact on either speed or reliability.	b) Both speed and reliability improve.	
	c) The speed decreases, but the	d) Speed increases but reliability	



## SERIES: B

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for (int i = 0; i < 4; i++) {  
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}" [U] [1]
- a) 4 b) 2  
c) 3 d) 5
- 30 How would you calculate the output voltage of a voltage divider with resistances R1 = 10kΩ and R2 = 10kΩ, and input voltage = 12V? [U] [2]
- a) 3V b) 6V  
c) 4V d) 8V
- 31 Identify which component is the "brain" of the Arduino board. [U] [1]
- a) Power supply b) Voltage regulator

## SERIES: B

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c) Microcontroller d) USB port  
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c) pinMode(3, OUTPUT); d) pinMode(3, ANALOG);
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**END OF THE QUESTION PAPER**

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