b. i.	Write a Python program to turn an LED ON and OFF with a push switch to that it toggles between ON and OFF, each time switch is pressed.	6	3	2	4
ii.	Write a Python code to interface a keypad with a Raspberry Pi.	6	3	2	4
30. a.	Develop a method to measure resistance using resistors and capacitor. Draw the suitable diagram and give the Python Code.	12	3	3	3
	(OR)				
b.	Write a Python Code to measure temperature using TMP36 and ADC (MCP3008) with Raspberry Pi. Draw its schematic diagram and explain.	12	3	3	3
31. a.	Construct a Raspberry Pi based embedded system to measure distance using an ultrasonic range finder. Write a Python code also.	12	3	4	4
	(OR)				
b.	Interface HD44780 – compatible LCD module with Raspberry Pi. Write a Python Code to display any text messages on an Alphanumeric LCD display.	12	3	4	4
32. a.	A DHT11 sensor is connected to GPIO pin 19 of a Raspberry Pi. Write a Python code to publish the sensor value using MQTT protocol. Also explain the steps involved in it.	12	3	5	3
	(OR)				
b.	Interface a LED with Raspberry Pi and write a node.js code to blink the LED with 250ms delay for 5S.	12	3	5	3

* * * * *

Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2023

Fifth and Sixth Semester

18ECO109J – EMBEDDED SYSTEM DESIGN USING RASPBERRY PI

(For the candidates admitted from the academic year 2018-2019 to 2021-2022)

Note:

(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours Max. Marks: 100

		Marks	BL	CO	PO
	PART – A (20 × 1 = 20 Marks) Answer **ALL** Questions				
1.	What will be the output of the following python expression print(int(5+2%3)) (A) 2 (B) 3 (C) 5 (D) 7	1	2	1	5
2.	The output of int("1110",2) statement will be _____ (A) 1110,1111 (B) 7 (C) 10 (D) 14	1	3	1	5
3.	Which of the following is correct with respect to the following python code? $d = \{"a":3,"b":7\}$ (A) A dictionary 'd' is created (B) a and b are the values of dictionary 'd' (C) 3 and 7 are the keys of dictionary 'd' (D) One dictionary is appended to other	1	3	1	5
4.	What will be the output of below python code? strl= "Information" print(str[2:8]) (A) Ormat (B) Format (C) Formation (D) Orma	1	3	1	5
5.	_____IC chip is used to control the direction of DC motor. (A) 8085 (B) 6800 (C) L293D (D) 14M	1	1	2	4
6.	Which of the following is not a component of a stepper motor? (A) Windings (B) Rotor (C) Commutator (D) Stator	1	1	2	4
7.	Find a option that is false related to gear motor (A) Combination of motor and gearbox (B) Reduce the RPM (C) Increase torque (D) Balances gyro effect	1	2	2	4

8. Find the correct sequence that is created when rotaly encoder knob is turned anti-clockwise — 1 1 2 4
   (A) '10', '11', '00', '11' (B) '00', '01', '10', '11'
   (C) '10', '11', '01', '00' (D) '11', '00', '10', '01'

9. Which one of the following is not a feature of Adafruit GPS module? — 1 2 3 3
   (A) DGPS/WAAS/EGNOS supported (B) FCC E911 compliance and AGPS support
   (C) Upto 234 PRN channels (D) Multipath detection and compensation

10. Which of the following represents IR wavelength? — 1 1 3 3
   (A) 100 nm to 700 nm (B) 700 nm to 2500 nm
   (C) 2500 nm to 5000 nm (D) Greater than 2500 nm

11. The supply voltage requirement for PIR module of Adafruit is — 1 1 3 3
   (A) 5V (B) 3.3 V
   (C) 12 V (D) 1.6 V

12. In ADC MCP3008 chip, the pin which is used to initiate communication with the device by connecting it to low logic level? — 1 1 3 3
   (A) DGND (B) SHDN
   (C) AGND (D) CLK

13. The command grid.setpixel (2,2,4) is _____ — 1 2 4 1
   (A) Set pixel at (2,2) 4th color (B) Set pixel at (2,2) red color
   (C) Set pixel at (2,2) green color (D) The command through error

14. When you plug a USB-flash drive into a raspberry Pi, it automatically installs it under _____ — 1 2 4 11
   (A) /root (B) /media
   (C) /home (D) /bin

15. An embedded system requires to display temperature reading in 2 digits, then the cost-effective display could be _____ — 1 2 4 4
   (A) A 8*8 LED matrix (B) An LCD interface
   (C) A 2*7 segment LED display (D) A 4*7 segment LED display

16. In CSV file format values are separated using _____ — 1 1 4 11
   (A) :delimiter (B) Space delimiter
   (C) /delimiter (D) >delimiter

17. The conf dictionary to pass configuration data to the _____ — 1 2 5 3
   (A) Bootstrap (B) Pycamera module
   (C) Cherrypy (D) MQTT

18. An MQTT client which is publishing sensor data need to _____ — 1 2 5 3
   (A) Create a topic (B) Subscribe to a topic
   (C) No need to create or subscribe the topic (D) It is mandatory to create and subscribe a topic

19. A JSON format of representing temperature and humidity is _____ — 1 2 5 3
   (A) Temp=[35]; humidity =[40] (B) [temp, humidity]=[35,40]
   (C) [temp, humidity]={35,40} (D) Sensor_data={'temperatrue':0, 'humidity'=0}

20. Which of the following is correct about JavaScript? — 1 2 5 3
   (A) JavaScript is an object-based language (B) JavaScript is assembly language
   (C) JavaScript is an object-oriented language (D) JavaScript is a high-level language

PART – B (5 × 4 = 20 Marks)

Answer **ANY FIVE** Questions

		Marks	BL	CO	PO
21.	With suitable examples, explain any two condition statements in Python.	4	2	1	5
22.	Write a Python program to find minimum element from a list of elements along with it index in the list.	4	3	1	5
23.	Write the characteristic of a Servomotor.	4	1	2	4
24.	Plan to produce a simple robot rover. Give the hardware and Python programming tips to build the robot.	4	2	2	4
25.	Illustrate the features of spark fun gas sensor. (MQ-4).	4	2	3	3
26.	Show the steps to display on a four – digit LED matrix with I^2C interface.	4	2	4	4
27.	Explain the following: i. Node.js - Built in HTTP module ii. Node.js as a file server	4	3	5	3

PART – C (5 × 12 = 60 Marks)

Answer **ALL** Questions

		Marks	BL	CO	PO
28. a. i.	Write a Python program to generate a list of elements of Fibonacci series.	6	3	1	5
ii.	Write a Python program that repeatedly asks the user to enter product names and prices. Store all of them in a dictionary whose keys in dictionary whose keys are product names and values are prices. And also write a code to search an item from the dictionary. And explain the logic.	6	3	1	5
	(OR)				
b.	With a neat diagram, explain the method to interface the Raspberry Pi with Buzzer and write a Python Program to generate buzzing sound in different pitch and duration.	12	3	1	5
29. a.	With a neat diagram, explain the method to interface the Raspberry Pi with the Unipolar stepper motor. Give the Python code to control the direction of the stepper motor.	12	3	1	5
	(OR)				