Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2024

Fifth &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

PART – A (20 × 1 = 20 Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
1. What will be the output of below Python code? str1="Information" print (stra[2:8]) (A) format (B) formatio (C) orma (D) ormat	1	2	1	5
2. What will be the output of the following Python code snippet? print (2**4+(5+5)**(1+1)) (A) Error (B) 28 (C) 118 (D) 116	1	2	1	5
3. Which of the following is false regarding loops in python? (A) Loops are used to perform certain tasks repeatedly (B) While loop is used when multiple statements are to executed repeatedly until the given condition becomes false (C) While loop is used when multiple statement are to executed repeatedly unitl the given condition becomes true (D) For loop can be used to iterate through the elements of lists	1	2	1	1
4. To control a high power load say LED panel, one has to use _____ (A) MOSFET (B) BJT (C) Diode (D) Tetrode	1	1	1	1
5. The statement time-sleep (0.4) will make the processor to wait for (A) 40 minutes (B) 0.4 minute (C) 400 miliseconds (D) 0.4 nanosecond	1	2	2	4
6. Find the right sequence that will help to rotate stepper motor? (A) '1010', '0110', '0101', '1001' (B) '1100', '0011', '1000', '1110' (C) '0001', '1110', '1111', '0000' (D) '1110', '0010', '1101', '1000'	1	1	2	4

7.	Position of the servomotor is set by _____ of a pulse. (A) Phase (B) Power (C) Length (D) Frequency	1	1	2	4
8.	Following piece of code is used in GPIO. Add_event _detect(18, GPIO. Falling, callback=my_callback) (A) Polling method (B) LED programming (C) DC motor control (D) Interrupt method	1	2	2	4
9.	Pyroelectric sensors can detect (A) Ultraviolet radiation (B) Infrared radiation (C) Infrasound radiation (D) Sonic radiation	1	1	3	3
10.	In ADC MCP 3008 chip, the pin which is used to initiate communication with the device by connecting it to the low logic level? (A) AGND (B) CLK (C) SHDN (D) DGND	1	1	3	3
11.	MQ-4 gas sensor can be used to detect (A) Green house gases (B) Helium (C) Argon (D) Non-flammable gases	1	1	3	3
12.	The accuracy error of TMP 36 and DS1820 are _____and _____respectively. (A) 0.4%, 2% (B) 1%, 3% (C) 2%, 0.5% (D) 0.01%, 0.005%	1	1	3	3
13.	The two signals used in ultrasonic range finder SR-04 are (A) RX, TX (B) TRIG, ECHO (C) SCLK, SDAT (D) DQ, DEN	1	1	4	4
14.	When you plug a USB-Flash drive into a raspberry pi, it automatically installs it under (A) /root (B) /home (C) /bin (D) /media	1	2	4	4
15.	An embedded system requires to display temperature reading in 2 digits then the cost effective display could be (A) A 4 * 7 segment LED display (B) 8* 8 LED matrix (C) A 2 * 7 segment LED display (D) An LCD interface	1	2	4	4
16.	Large scale database analytics services big query is available in (A) Google cloud platform (B) Linux azure (C) Windows apache (D) IBM code developer	1	1	4	11
17.	The conf dictionary to pass configuration data to the _____ (A) Bootstrap (B) Pycamera module (C) MQTT (D) Cherrypy	1	2	5	3

18. To include the HTTP server in the node module, what function do we use? 1 2 5 3

(A) get( ) (B) require( )
(C) expose( ) (D) createserver( )

19. Which of the following is the correct output for the following javascript code? 1 2 5 3

```
var x=5, y=1
var obj = {x:10}
with (obj)
{
alert (y)
}
```

(A) 1 (B) Error
(C) 10 (D) 5

20. MQTT is _____protocol. 1 2 5 3

(A) Internet of things (B) Machine to machine
(C) Machine to machine and IOT (D) Machine things

PART – B (5 × 4 = 20 Marks)

Answer **ANY FIVE** Questions

Marks BL CO PO

21. Write a python program to find second largest number in a list. 4 3 1 5

22. Write a python script to generate and print a dictionary that contains a number (between 1 and n) in the form (X, X*X). 4 3 1 5

23. Plan to produce a simple robot rover. Give the hardware and python programming tips to build the robot. 4 2 2 4

24. What is the behavior of GPIO input with pull-up and pull-down resistors? 4 1 2 4

25. Explain any two cloud services used for IOT department. 4 1 4 11

26. Identify any four attributed of Adafruit GPS module. 4 1 3 3

27. A DHT11 sensor is connected to GPIO pin 19 of Raspberry Pi. Write a python code to display temperature and humidity. 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 read integer from user and store them in a list. The program should continue reading until the user enters zero. Then it should display all the numbers in ascending order. 6 3 1 5

ii.	Write a python program to find the cumulative sum of elements in a list.	6	3	1	5
	(OR)				
b.	With a neat diagram, explain the method to interface Raspberry Pi with LED and write a python program to control the brightness of the LED using PWM.	12	3	1	1
29. a.	With a neat diagram, explain the method to interface Raspberry Pi with DC motor. Give the python code to control the direction of the DC motor.	12	3	2	4
	(OR)				
b.	Interface Raspberry Pi with a rotary quadrature encoder. Write a python code to detect the rotation using rotary encoder.	12	3	2	4
30. a.	A light sensor is interfaced with Raspberry Pi using capacitor method. Draw the circuit diagram and write a python code to display the intensity of the instant light.	12	3	3	3
	(OR)				
b.	Interface Raspberry Pi with ADC (MCP 3008). Write a python code to measure the voltage using resistive sensor.	12	3	3	3
31. a.i.	Sketch the one-wire method to connect temperature sensor DS18B20 with Raspberry Pi.	4	1	4	4
ii.	Write a python code to extract temperature value from DSI8B20 sensor. Assume the sensor and raspberry Pi are connected by one-wire method.	8	3	4	4
	(OR)				
b.	Interface HD44780-compatible LCD module with Rasberry Pi. Write a python code to display any text message on an alphanumeric LCD display.	12	3	4	4
32. a.	With the necessary python code, explain MQTT protocol-installation and setting account, taken creation, reading sensor data and pushing to thingsboard.	12	3	5	3
	(OR)				
b.	Use Raspberry Pi based and Node.js to make a LED to blink. Write a program and draw a relevant diagram.	12	3	5	3

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