28. a.i.	Identify the characteristics of analog to digital converter (MCP 3008).	5	4	3	3
ii.	Construct a method using photoresistor and MCP3008 ADC to find light intensity in terms of voltage. (Hint: Code not required).	5	4	3	3
	(OR)				
b.i.	Develop a code to detect 'tilt direction' detection.	6	3	3	3
ii.	Illustrate the working of accelerometer.	4	3	3	3
29. a.i.	Direct a ultrasonic range finder and bring out the working behind it.	5	4	4	3
ii.	Illustrate the characteristics of ultrasonic range finder (SR-04).	5	3	4	3
	(OR)				
b.i.	Show the steps to display on a four digit LED matrix with I2C interface.	5	3	4	3
ii.	Use colour eight by eight ( ) function in the code to display different colours in 8×8 LED matrix.	5	3	4	3
30. a.i.	Sketch the MQTT publish/subscribe architecture and explain the key points.	5	3	5	3
ii.	Assume Pi camera is connected to Raspberery Pi through CSI camera port. Write a code to take a photo.	5	4	5	3
	(OR)				
b.	Use Raspberry Pi board and Node.js to make a LED to blink. Write a program and draw a relevant diagram.	10	3	5	4

* * * * *

Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2022

Sixth Semester

18ECO109J – EMBEDDED SYSTEM DESIGN USING RASPBERRY PI

(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

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** should be answered in answer booklet.

Time: 2½ Hours Max. Marks: 75

	Marks	BL	CO	PO

PART – A (25 × 1 = 25 Marks)

Answer **ALL** Questions

1. What will be the output of following python expression if $x = 56.233$? print $("\%d"\%x)$ — 1 2 1 5

   (A) 56.238 (B) 56.23

   (C) 56.2 (D) 56

2. What will be of output of the following python code snippet if x=5? — 1 2 1 5

   $x**3$

   (A) 17 (B) 2

   (C) 5 (D) 125

3. Which of the following function convert a string to a real number in python? — 1 2 1 5

   (A) $\text{int}(k)$ (B) $char(y)$

   (C) $float(x)$ (D) $reel(x)$

4. To control a high power load say LED panel, one has to use — 1 1 1 1

   (A) BJT (B) MOSFET

   (C) Diode (D) Tetrode

5. What will be the output of the following python code snippet if $x = 1$? — 1 2 1 5

   $x << 2$

   (A) 4 (B) 2

   (C) 1 (D) 7

6. The following code snippet belongs to $< h_1 > GPIO\ control < /h_1 >$ — 1 1 2 2

   (A) http (B) Python

   (C) HTML (D) SML

7. Find out the non-permissible parameter in GPIO.add-event-detect( ) is — 1 1 2 1

   (A) Pin number (B) GPIO.falling

   (C) Call back (D) Import

8.	For proper functioning, the coils in the stepper motor should be energized (A) Persistently (B) Randomly (C) In a sequence (D) Based on availability of power	1	1	2	1
9.	Quadrature encoder behaves like a pair of (A) Amplifiers (B) Oscillators (C) Switches (D) Regulators	1	1	2	2
10.	A bipolar stepper motor can be controlled by (A) Sparkify board (B) Applying pressure (C) I^2C communication (D) Raspirobot board	1	1	2	3
11.	The MQ-4 can detect natural gas concentrations anywhere from (A) 200 ppm-10000 ppm (B) 2 ppm-10 ppm (C) 500 ppb-1000ppb (D) 200ppb-400ppb	1	1	3	5
12.	The number of channels in MCP3008 analog to digital converter is (A) 2 (B) 22 (C) 8 (D) 40	1	1	3	5
13.	Which of the following represents IR wavelength? (A) 10 nm to 150 nm (B) 700 nm to 2500 nm (C) 4000 $A°$ to 7000 $A°$ (D) Greater than 25 mm	1	1	3	3
14.	Following code snippet is associated with print("$lat = \%f \backslash t\ \ lon = \%f \backslash t\ time = \%s$" $\%(lat, lon, report['time']))$ (A) Temperature sensor (B) Ultrasonic range finder (C) Display module (D) GPS device	1	2	3	5
15.	In the temperature sensor TMP36_____is proportional to temperature (A) Power (B) Current (C) Voltage (D) Resistance	1	1	3	3
16.	Large scale database analytics service bigquery is available in (A) Linux azure (B) Windows apache (C) Google cloud platform (D) IBM code developer	1	1	4	3
17.	Find the non-available column and row combination for a alphanumeric LCD (A) 8×1 (B) 16×2 (C) 20×2 (D) 23×11	1	1	4	4
18.	Popular LCD module controller developed by hitachi is (A) 8085 (B) HD44780 (C) Hita87 (D) 80486	1	1	4	4
19.	The device TMP36 is a (A) Temperature sensor (B) Heat sink (C) Ultrasonic range finder (D) LED controller	1	1	4	3
20.	The spreadsheet used in raspberry (A) Excel (B) Gnumeric (C) Opencalc (D) Tensor flow	1	1	4	4
21.	The language that can turn a HTML web page into a fully functioning desktop equivalent application (A) C++ (B) MQ++ (C) Ada fruit (D) Javascript	1	2	5	5
22.	Eclipse paho is a (A) Java server library (B) Java script client library (C) Javabyte peer (D) Raspberry Pi library	1	1	5	5
23.	Following is a front-end frame work for faster and earier web development (A) Visual Basic (B) Dbase (C) HTTP (D) Bootstrap	1	1	5	5
24.	Which is not true for MQTT is (A) It is Bi-directional communication protocol (B) It is a reliable message delivery protocol (C) It is a security enabled protocol (D) Supports high data rate with maximum bandwidth	1	2	1	2
25.	Cherry Pi is a (A) Python based web frame work (B) Java script web frame work (C) C++ library (D) MQTT dashboard module	1	1	5	5

PART – B (5 × 10 = 50 Marks)

Answer **ALL** Questions

		Marks	BL	CO	PO
26. a.i.	Choose the right function in python. So as to carry out number to string and to replace one string with other.	5	3	1	5
ii.	Create a list with five items in python. Use the code to access the list and add new entry in different ways.	5	4	1	5
	(OR)				
b.i.	Solve the celcius to Fahrenheit conversion with python's function feature.	5	4	1	5
ii.	Create a telephone directory using python's dictionary facility. Write the code to iterate over the dictionary.	5	4	1	5
27. a.	Illustrate the method to control the servo motor.	10	3	2	1
	(OR)				
b.i.	Demonstrate the operation of H-bridge.	5	3	2	3
ii.	Plan to produce a simple robot rover. Give the hardware and python programming tips to build the robot. (Hint: Code not required).	5	3	2	3