28. a.	Explain the process of implementing a serial communication/data transfer by a master-slave configuration on a I2C protocol.	10	4	2	3
	(OR)				
b.	Write a program in mbed, to display "Hello" by utilizing LCD objects and functions.	10	4	3	3
29. a.i.	Explain the electronic memory types used in the ARM processor architecture.	5	3	4	1
ii.	List any 5 studio library functions that will operate on local file system of mbed.h.	5	3	4	1
	(OR)				
b.	State the format/frame structure of Ethernet and explain the steps involved to implement a simple mbed-ethernet communication interface.	10	4	4	1
30. a.	What is MIDI in digital audio processing? How to send USB MIDI data from an mbed controller?	10	5	5	3
	(OR)				
b.	List the essentials required to work with wave audio files using wave information header.	10	5	5	3

* * * * *

Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY2022
Sixth Semester

18ECE204J – ARM BASED EMBEDDED SYSTEM DESIGN
(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

PART – A (25 × 1 = 25 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
1.	The number of processor modes in ARM is (A) 2 (B) 3 (C) 5 (D) 7	1	1	1	1
2.	The unit which can improve the reliability of an embedded system by protecting critical data unit within the user application is (A) Cache (B) Memory protection unit (C) DMA (D) Interrupt controller	1	1	1	1
3.	If-else structure in a program is a type of (A) Branch instruction (B) Memory instruction (C) Control instruction (D) Data instruction	1	2	1	1
4.	The 8 bit instruction in an ARM processor is called as (A) Java byte code (B) Jazelle (C) Thumb (D) Pecode	1	2	1	1
5.	Any instruction that is applied to register $R0$, can be equally applied to any of the other registers from $R0-R13$. This property is called as (A) Equality (B) Pipeline (C) Orthogonality (D) Condensed	1	2	1	1
6.	In ADC, the signals SC and EOC refers to (A) Start conversion, end of conversion (B) Start conversion, end of code (C) Select conversion, end of conversion (D) Select conversion, end of code	1	2	2	3
7.	Wait-ms is a command used for (A) Wait for the number of milliseconds specified as float (B) Wait for the number of milliseconds specified as int (C) Wait for the number of microseconds specified as int (D) Wait for the number of microseconds specified as float	1	2	2	3

8. If a signal has 100% duty cycle, it means that the signal is — 1 2 2 3
   (A) Unstable
   (B) Stable and with increasing frequency
   (C) Continuously ON
   (D) Continuously OFF

9. # include mbed.h — 1 3 2 3
   PWMout PWM1(P21)
   int main ( ){
   PWM1 =0.5;
   }
   In this program, PWM1=0.5 means
   (A) Period=0.5ms
   (B) Duty cycle =0.5 ms
   (C) Period = 0.5 sec
   (D) Duty cycle is 50%

10. The worst case quantization error in an ADC is half of _____ — 1 2 2 3
    (A) Reference voltage
    (B) Resolution
    (C) No of binary digits
    (D) Accuracy

11. SCL and SDA stands for — 1 2 3 3
    (A) Serial clock, start data
    (B) Serial clock, serial data
    (C) Start clock, start data
    (D) Select clock, select data

12. _____flag is used to check the controller status in LCD interfacing. — 1 2 3 3
    (A) Available
    (B) Status
    (C) Busy
    (D) Check

13. Locate (x, y) in an LCD interfacing program is used to — 1 2 3 3
    (A) Get x, y and set display cursor position
    (B) Reset display position
    (C) Make x,y reallign with Z axis
    (D) Converts x,y to scaled axis

14. The memory which retains its data even when the power is removed is called as _____ — 1 3 3 3
    (A) Non volatile memory
    (B) Volatile memory
    (C) Memory cell
    (D) Resistive memory

15. Which of the following is the fastest means of access for CPU? — 1 3 4 1
    (A) Registers
    (B) Cache
    (C) Main memory
    (D) Motherboard

16. The number of coordinating nodes in a Zigbee device — 1 2 3 3
    (A) 1
    (B) 2
    (C) 3
    (D) 4

17. SRAM is a type of _____memory — 1 2 2 3
    (A) Dynamic
    (B) Volatile
    (C) Scaled
    (D) High level capacitive

18. FSEEK is used to — 1 2 5 4
    (A) Request a file from client
    (B) Request a file from server
    (C) Request a file transfer
    (D) Moves the file pointer to specified location

19. Which one of the following defines a pointer which points to data of type int? — 1 3 6 3
    (A) int *ptr
    (B) int ptr
    (C) char*ptr
    (D) char ptr

20. The C standard input and output library is defined as — 1 2 4 1
    (A) mbed.h
    (B) console.h
    (C) stdio.h
    (D) studio.h

21. MIDI stands for — 1 2 5 4
    (A) Mini Integrated Digital Interface
    (B) Musical Instrument Digital Interface
    (C) Musical Integer Digital Interconnect
    (D) Mini Integrated Digital Input

22. char write_string[64] is a — 1 2 4 1
    (A) int file
    (B) character file
    (C) character array upto 8
    (D) character array upto 64

23. If the file pointer has a null value, which means it — 1 3 6 3
    (A) Creates a getc
    (B) Creates a stream
    (C) Forces a close
    (D) FOPEN was not successfully implemented

24. USBMIDI midi is a syntax to — 1 3 5 3
    (A) Initialize MIDI interface
    (B) Restart USB
    (C) Use MIDI to communicate
    (D) Connect MIDI to video

25. Zoohz.wav is — 1 2 5 4
    (A) Video intermediate file
    (B) An audio file of 200 Hz sine wave
    (C) An audio file of 200 Hz square wave
    (D) Video file of 200 Hz

PART – B (5 × 10 = 50 Marks) — Marks BL CO PO
Answer **ALL** Questions

26. a. Explain the ARM core data flow model with the deployment of ARM registers in the user mode. — 10 3 1 1

(OR)

b. Explain ARM instruction set with pre and post processing execution for any two data processing and conditional instructions. — 10 4 1 1

27. a. Write a program in mbed which could flash mbed LED1 ON and OFF. Demonstrate the code with digital IN, OUT and wait statements/functions. — 10 4 2 3

(OR)

b. Write a program in mbed to generate a sawtooth and a sine waveform on a DAC interface. Specify your comment to improve resolution for a sawtooth wave generated. — 10 4 3 3