Reg. No.															

B.Tech. DEGREE EXAMINATION, NOVEMBER 2023
Sixth Semester

18ECE204J – ARM - BASED EMBEDDED SYSTEM DESIGN
(For the candidates admitted from the academic year 2020-2021 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. ARM is a type of _____ processor. (A) CISC (B) RISC (C) 64 bit (D) HPC	1	1	1	1
2. The number of processor modes in ARM execution is _____ (A) 2 (B) 3 (C) 5 (D) 7	1	2	1	1
3. The 8 bit instruction of ARM processor is called as _____ (A) Thumb instruction (B) ARM instruction (C) Jazele instruction (D) Java byte code	1	1	1	1
4. What will be the output of the instruction MOV $r7,r5,LSL\pm2$ when the input is $r5=5$ and $r7=8$ is? (A) R7=20 (B) R7=23 (C) R7=24 (D) R7=25	1	2	1	1
5. The instruction ADC R_d, R_n, N will produce which of the following execution (A) $R_d = R_n + N + carry$ (B) $R_d = R_n + N$ (C) $R_d = N + carry$ (D) $R_n = R_d + N + carry$	1	2	1	1
6. Wait_ms is a command used for (A) Waits for the number of milliseconds specified as int (B) Waits for microseconds specified as int (C) Waits for seconds specified as int (D) Waits for milliseconds specified as float	1	1	2	1
7. Pin numbers _____are configured as digital input and/or outputs in mbed microcontroller. (A) 1 to 26 (B) 5 to 30 (C) 21 to 40 (D) 15 to 23	1	1	2	1

8. In ADC the signal SC stands for _____ 1 2 2 3

(A) Start conversion (B) Start connection
(C) Stop conversion (D) Service connection

9. Duty cycle of PWM is given as _____ 1 2 2 3

(A) DC = pulse on time /(pulse off +pulse period) (B) DC=pulse ON time * 100/pulse off time
(C) DC=pulse period * 100/pulse off time (D) DC= pulse ON time* 100/pulse period

10. Fill the missing line to display a sawtooth waveform 1 2 3 3

```
# include <mbed.h>
Analog out Aout(P18);
float i;
int main ( ) {
while (1)
for (i=0;i<1,i){
wait (0.001);
}}}
```

(A) $A_{out} = 1$ (B) $A_{out} = 0$
(C) $A_{out} = i$ (D) $A_{out} = 0.001$

11. SDA stands for _____ 1 1 3 1

(A) Serial data (B) Start data
(C) Send data (D) Stop data

12. Address ( ) function in I_2C interface is used for _____ 1 2 3 1

(A) Read from an I_2C master (B) Sets the I_2C slave address
(C) Resets the I_2C slave back into known ready receiving state (D) Checks to see if this I_2C slave has been addressed

13. Printf is used to _____ 1 1 3 3

(A) Write a string in ASCII format (B) Write a string in hexadecimal format
(C) Write a formatted string (D) Write a float number

14. The memory which retains its data even when power is removed is called _____ 1 1 4 3

(A) Volatile memory (B) Memory cell
(C) Resistive memory (D) Non volatile memory

15. What is the location of the internal registers of CPU? 1 2 4 3

(A) Internal (B) On chip
(C) External (D) Motherboard

16. DRAM needs to be accessed every few milliseconds to refresh the charges, otherwise the information is _____ 1 2 4 3

(A) Duplicated (B) Forward to next block of memory
(C) Archived (D) Lost

17.	_____ is specifically intended to allow the MBED to utilize an external flash mass storage device (MSD) on the USB bus. (A) USB host MSD (B) USB host (C) Host API (D) Usb API	1	3	4	3
18.	MIDI note value 60 represents middle C (also reffered to as C4) which has a fundamental frequency of _____ (A) 261.63 Hz (B) 266.63 Hz (C) 251.63 Hz (D) 241.663 Hz	1	3	5	4
19.	S20kHz – tick-attach-US(&& 20 kHz-task, 50) means_____ (A) To attach 50 µs timer count (B) To attach a subroutine to 50 µs clock (C) To attach task to 50 µs timer code (D) To attach task to 50 µs tick	1	3	5	4
20.	# define BUFFERSIZE 0×ff define a memory size of _____ (A) 128 (B) 64 (C) 256 (D) 512	1	2	5	4

PART – B (5 × 4 = 20 Marks)

Answer **ANY FIVE** Questions

		Marks	BL	CO	PO
21.	Compare RISC and use instruction and processor.	4	2	1	1
22.	Draw and explain CPSR format of ARM cortex processor.	4	2	1	1
23.	Write a program in MBED to read input through ADC and transfer PC terminal.	4	3	2	2
24.	Write short notes on seven segment displays and the hexadecimal code for digit display.	4	3	2	3
25.	Draw the format of function mode control register of LCD of LPC1768 processor.	4	3	3	3
26.	Distinguish between formatted and unformatted statements in using data files with MBED?	4	3	4	1
27.	Draw the structure of analog reconstruction files and write short notes on its use.	4	3	5	4

PART – C (5 × 12 = 60 Marks)

Answer **ALL** Questions

		Marks	BL	CO	PO
28. a.	Draw and explain the ARM LPC1768 architecture in detail?	12	1	1	1
	(OR)				
b.	With necessary codes explain the various operation available in C language.	12	1	1	1

29. a.	With neat sketch explain the working of successive approximation Analog to Digital converter.	12	2	2	3
	(OR)				
b.	How can you generate PWM wave of different duty cycle? Explain the process in detail.	12	2	2	3
30. a.	Distinguish between richer and timeout mode in MBED timer controller with C code implement this and explain in detail	12	4	3	4
	(OR)				
b.	Draw a 16 × 16 bitmap image and divide pixels into 4 × 4 blocks and write a hex code to display checker board pattern of the same. Explain the concept behind the graphic formation	12	4	3	4
31. a.	How can you access data files in MBED controller? Explain the concepts and code related to it?	12	4	3	4
	(OR)				
b.	Explain data communication using higher in MBED microcontroller in detail	12	4	3	4
32. a.	What is MIDI in digital audio processing? How to send USB MIDI data from an MBED controller?	12	2	4	3
	(OR)				
b.	List the essentials required to work with wave audio files using wave information header.	12	2	4	3

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