ii.	Categorize the different families of PIC microcontroller with respect to its features.	5	2	3	1
	(OR)				
b.i.	Classify the different variants of ARM processor.	5	2	3	1
ii.	Contrast the three staged and five stage pipelined architecture.	5	2	3	1
29. a.	Explain in detail about RS232 communication protocol.	10	2	4	1
	(OR)				
b.	Appraise the operations, features and types of USB communication protocol.	10	2	4	1
30. a.	Interpret the possibility of shared data problem and re-entrancy in real time operating system.	10	2	5	1
	(OR)				
b.	Explain the following in contrast to RTOS				
	(i) Mailboxes and pipes	5	2	5	1
	(ii) Message queues	5	2	5	1

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Reg. No.														

B.Tech. DEGREE EXAMINATION, NOVEMBER 2022
Sixth and Seventh Semester

18EEC308J – 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

		Marks	BL	CO	PO
	PART – A (25 × 1 = 25 Marks) Answer **ALL** Questions				
1.	Intel 8031, 8051 and 8751 has how many number of timers? (A) 2 (B) 3 (C) 4 (D) 1	1	1	1	1
2.	Which of the following are used for byte test and conditional jump? (A) JB (B) SJMP (C) DJNZ (D) JNB	1	1	1	1
3.	How many bytes of bit addressable memory is present in 8051 based microcontroller? (A) 8 bytes (B) 32 bytes (C) 16 bytes (D) 128 bytes	1	1	1	1
4.	_____variable is visible within the function of embedded programming. (A) Global variable (B) Undefined variable (C) Defined variable (D) Automatic variable	1	1	1	1
5.	Let A = 0×64, B =0×10 find C =A|B (A) C=0×43 (B) C=0×22 (C) C=0×74 (D) C=0×12	1	1	1	2
6.	How many times does the setup( ) function run on every startup of the Arduino system? (A) 4 (B) 5 (C) 2 (D) 1	1	1	2	2
7.	What is the use of the ESP 8266 WiFi module? (A) Network provider (B) Switches circuits (C) Evaluates air pressure (D) Monitors motion	1	1	2	1
8.	What type of signal does the analogwrite( ) function gives at the output? (A) Pulse code modulated signal (B) Frequency modulated signal (C) Pulse width modulated signal (D) Pulse amplitude modulated signal	1	1	2	1

9. What is the use of the Ethernet library? 1 1 2 1
   (A) To connect the Arduino to Ethernet (B) To connect the Arduino to Li-Fi
   (C) To connect the Arduino to Bluetooth (D) To connect the Arduino to Wi-Fi

10. What language is a typical Arduino code based on _____programming? 1 1 2 1
   (A) Assembly (B) Python
   (C) Java (D) C|C++

11. Identify the correct instruction of PIC which AND literal value into W from the following 1 1 3 1
   (A) andlw (B) andwf
   (C) andff (D) andwl

12. The RPO bit in PIC microcontroller is in _____register. 1 1 3 1
   (A) Flag (B) Status
   (C) FSR (D) INDF

13. In PIC microcontroller, the 'W' register serves the purpose similar to _____of 8051 microcontroller. 1 1 3 1
   (A) Program counter (B) Instruction register
   (C) Accumulator (D) ISR

14. The ARM instruction set features _____ 1 1 3 1
   (A) 5-address register instruction (B) Load-store architecture
   (C) Load and store single register (D) Shift and ALU operations

15. Thumb instructions are used to access the _____ 1 1 3 1
   (A) Current program status register (B) Stack pointer
   (C) Program counter (D) Address bus

16. Which of the following have asynchronous data transmission? 1 1 4 1
   (A) SPI (B) RS 232
   (C) Parallel port (D) I2C

17. How much time period is necessary for the slave to receive the interrupt and transfer the data? 1 1 4 1
   (A) 4 clock time period (B) 8 clock time period
   (C) 16 clock time period (D) 24 clock time period

18. When the USB is connected to a system, its root hub is connected to the _____ 1 1 4 1
   (A) PCI bus (B) SCSI bus
   (C) Processor bus (D) IDE

19. The devices connected to USB is assigned a _____address. 1 1 4 1
   (A) 9 bit (B) 16 bit
   (C) 4 bit (D) 7 bit

20. The request-respond is a _____model and it is _____ 1 1 4 1
   (A) Communication, stateless (B) Communication, state full
   (C) Protocol, state less (D) Protocol, state full

21. In real time operating system _____ 1 1 5 1
   (A) All process have the same priority (B) A task must be serviced by its deadline period
   (C) Process scheduling can be done only once (D) Kernel is not required

22. Priority inversion is solved by use of _____ 1 1 5 1
   (A) Priority inheritance protocol (B) Two phase lock protocol
   (C) Time protocol (D) Time latency

23. What is the disadvantage of real addressing mode? 1 1 5 1
   (A) There is a lot of cost involved (B) Time consumption overhead
   (C) Absence of memory protection between process (D) Restricted access to memory locations by processes

24. The technique in which the CPU generates physical addresses directly is known as _____ 1 1 5 1
   (A) Relocation register method (B) Real addressing
   (C) Virtual addressing (D) Physical addressing

25. Earliest deadline first algorithm assigns priorities according to _____ 1 1 5 1
   (A) Periods (B) Deadlines
   (C) Burst times (D) Task

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

26. a. Sketch the 8051 architecture and explain the register sets used in it. 10 2 1 1

(OR)

b.i. Prioritize the different data types with respect to address range. 5 2 1 1

ii. Differentiate bit level operators and shift operators. 5 2 1 1

27. a. Illustrate the ATmega microcontroller functional block diagram with various features. 10 2 2 1

(OR)

b. Point out the role of following functions used in Arduino programming.
   (i) Math functions 4 2 2 1
   (ii) Advanced I/O functions 6 2 2 1

28. a.i. Distinguish between RISC and CISC architecture. 5 2 3 1