SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS), PUTTUR

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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Microprocessors and Microcontrollers (23EC0414)
Course & Branch: B.Tech –ECE, CSE, CCC
Year & Semester: III - B.Tech. & I-Semester **Regulation:** R23

UNIT I
8086 ARCHITECTURE
PART-A (2 MARKS)

1	a)	Define microprocessor.	[L1][CO1][2M]
	b)	If a DS register holds the address of 1000H and data reference contains an address of 0031H, find the physical address?	[L3][CO1][2M]
	c)	What is the function of ALE signal in 8086?	[L1][CO1][2M]
	d)	Define an interrupt vector and interrupt vector table.	[L1][CO1][2M]
	e)	Describe the function of Stack Pointer in 8086.	[L1][CO1][2M]

PART-B (10 MARKS)

2	a)	List the main features of 8086 microprocessor.	[L1][CO1][5M]
	b)	Describe about the 8086-microprocessor family.	[L1][CO1][5M]
3		Draw the functional pin diagram of 8086 microprocessor and explain the function of each and every pin.	[L1][CO1][10M]
4	a)	Explain in detail about the signals used in minimum mode of operation.	[L2][CO1][5M]
	b)	Explain in detail about the signals used in maximum mode of operation.	[L1][CO2][5M]
5	a)	Draw the internal architecture of 8086 microprocessor.	[L1][CO1][5M]
	b)	Discuss about the Execution unit of 8086 microprocessor.	[L2][CO1][5M]
6	a)	List and explain the general-purpose registers of 8086 microprocessor.	[L1][CO1][5M]
	b)	Draw the flag register of the 8086 microprocessor and explain about each flag in detail.	[L1][CO1][5M]
7	a)	Discuss about the Bus Interface Unit of 8086 microprocessor.	[L2][CO1][5M]
	b)	Discuss about the importance of memory segmentation in 8086 microprocessors.	[L2][CO1][5M]
8	a)	Explain about the following: i) Pointer and Index Registers ii) Segment Registers iii) Instruction byte Queue	[L1][CO1][5M]
	b)	Define an Interrupt. Explain the series of actions that an 8086 microprocessor does in response to an when an interrupt.	[L1][CO1][5M]
9		Define the following terms. i) Segment Base ii) Instruction Pointer iii) Pipelining iv) Instruction decoder v) Accumulator	[L1][CO1][10M]
10	a)	Explain about maximum mode read cycle with suitable timing diagrams.	[L2][CO1][5M]
	b)	Explain about minimum mode write cycle with suitable timing diagrams.	[L2][CO1][5M]
11	a)	Explain about maximum mode write cycle with suitable timing diagrams.	[L2][CO1][5M]
	b)	Explain about minimum mode read cycle with suitable timing diagrams.	[L2][CO1][5M]

UNIT II

8086 PROGRAMMING

PART-A (2 MARKS)

1	a)	List the program developing steps in 8086?	[L1][CO3][2M]
	b)	Give the instruction format used by 8086 microprocessor.	[L2][CO3][2M]
	c)	Write a simple 8-bit addition program using general purpose register.	[L3][CO3][2M]
	d)	What is the difference between SAR and SHR instructions?	[L1][CO3][2M]
	e)	What are the assembly language program development tools?	[L1][CO3][2M]

PART-B (10 MARKS)

2	a)	Draw the flowchart symbols used to represent 8086 programming.	[L1][CO3][5M]
	b)	What is an instruction? List various types of instructions in 8086.	[L1][CO3][5M]
3		What are data copy instructions? Explain any five data copy instructions with examples.	[L1][CO3][10M]
4		Discuss about the following instructions with examples. (i) ADD (ii) SBB (iii) DEC (iv) MUL (v) NEG	[L2][CO3][10M]
5	a)	Discuss about the following instructions with examples. (i) AND (ii) OR (iii) XOR	[L2][CO3][5M]
	b)	What is the difference between unconditional and conditional branch instructions? Explain with examples.	[L1][CO3][5M]
6	a)	Discuss about string manipulation instructions.	[L2][CO3][5M]
	b)	Explain any five flag manipulation instructions.	[L2][CO3][5M]
7	a)	Discuss about Processor control instructions of 8086.	[L2][CO3][5M]
	b)	List Various conditional branch instructions with its descriptions.	[L1][CO3][5M]
8		Define addressing modes? Explain various addressing modes of 8086 in detail.	[L1][CO3][10M]
9	a)	Describe about assembler directives.	[L1][CO3][5M]
	b)	Discuss about the following assembler directives. (i) DB (ii) DW (iii) DQ (iv) DT (v) ASSUME	[L2][CO3][5M]
10	a)	Write an assembly language program to add and subtract two 16-bit numbers.	[L3][CO3][5M]
	b)	Write an assembly language program to multiply two signed numbers using general purpose registers and explain by default where the result stores.	[L3][CO3][5M]
11	a)	Write an assembly language program to find factorial of a given number.	[L3][CO3][5M]
	b)	Write an assembly language program to find sum of the numbers 10H, 22H, 3BH, 46H, and 7FH.	[L3][CO3][5M]

UNIT-III
8086 INTERFACING

PART-A (2 MARKS)

1	**a)**	Define a RAM and ROM.	**[L1][CO4][2M]**
	b)	What is switch debouncing?	**[L1][CO4][2M]**
	c)	Mention any two features of Intel 8251.	**[L1][CO4][2M]**
	d)	Expand DMA and state its purpose.	**[L1][CO4][2M]**
	e)	List the applications of a stepper motor.	**[L1][CO4][2M]**

PART-B (10 MARKS)

2		Illustrate the interfacing of RAM and ROM with 8086 microprocessors with a neat diagram and address decoding.	**[L3][CO4][10M]**
3	**a)**	List the features of Intel 8255 PPI.	**[L1][CO4][4M]**
	b)	Discuss the architecture and operating modes of Intel 8255 Programmable Peripheral Interface.	**[L2][CO4][6M]**
4	**a)**	Explain about the interfacing of switches with 8086 microprocessors.	**[L2][CO4][5M]**
	b)	Differentiate between common cathode and common anode seven-segment displays.	**[L4][CO4][5M]**
5		Explain the working principle of a seven-segment display. Show how to interface it with 8086 through 8255.	**[L2][CO4][10M]**
6		Explain the applications of Software and Hardware interrupts in 8086 microprocessor.	**[L2][CO4][10M]**
7		With suitable diagram, explain the interfacing of Intel 8251 USART with 8086 microprocessors. Explain how synchronous and asynchronous modes are implemented.	**[L2][CO4][10M]**
8	**a)**	Explain the working of Intel 8237a DMA controller and its interfacing with 8086 microprocessors.	**[L2][CO4][6M]**
	b)	State four features of Intel 8237a DMA controller	**[L1][CO4][4M]**
9		Write an 8086-assembly language program to control the rotation of a stepper motor using 8255. Show the interfacing diagram and sequence of excitation.	**[L1][CO4][10M]**
10	**a)**	Discuss the interfacing techniques for Analog-to-Digital Converters with 8086 microprocessors.	**[L2][CO4][5M]**
	b)	With suitable diagram explain the interfacing of Digital-to-Analog converter with 8086 microprocessors.	**[L2][CO4][5M]**
11		Why is Intel 8259 Programmable Interrupt Controller needed in 8086 systems? Explain its operation and priority modes	**[L4][CO4][10M]**

UNIT – IV

MICROCONTROLLER

PART-A (2 MARKS)

1	**a)**	List the features of 8051 microcontroller.	**[L1][CO2][2M]**
	b)	List out the special function registers in 80851 microcontrollers.	**[L1][CO2][2M]**
	c)	Discuss about Data Pointer.	**[L2][CO2][2M]**
	d)	Explain about the function of a program counter.	**[L2][CO2][2M]**
	e)	Define Addressing Mode. List the different types of addressing modes.	**[L1][CO3][2M]**

PART-B (10 MARKS)

2		Draw the internal architecture of 8051 microcontroller and explain the function of each block present in it.	**[L1][CO2][10M]**
3	**a)**	Describe the internal RAM structure in the 8051 microcontrollers.	**[L1][CO2][5M]**
	b)	Review the PSW Register in 8051 microcontrollers.	**[L2][CO2][5M]**
4		Draw and explain the pin diagram of 8051 microcontroller.	**[L1][CO2][10M]**
5	**a)**	Discuss about various functions of 8051 ports.	**[L2][CO2][5M]**
	b)	Analyze the functionality of I/O pins ports and circuits in 8051 microcontrollers.	**[L4][CO2][5M]**
6	**a)**	Discuss any 3 logical operation instructions of 8051 microcontroller.	**[L2][CO3][5M]**
	b)	Give result for the following instructions with A=32, R1=77 A) ANL A,R1 B) CPL A C) XRL A,R1	**[L2][CO3][5M]**
7	**a)**	Discuss RR , RLC, and SWAP instructions with example.	**[L2][CO3][5M]**
	b)	Explain ADD, SUBB, DIV instructions of 8051 microcontroller with example.	**[L2][CO3][5M]**
8	**a)**	Differentiate between Jump and Call instructions.	**[L4][CO3][5M]**
	b)	Explain the following instructions A) PUSH B) POP C) XCHD	**[L2][CO3][5M]**
9		Describe the different types of addressing modes supported by 8051 with suitable examples.	**[L2][CO3][10M]**
10	**a)**	Write an ALP to place the number 34H in register R5, R6, and R7 using immediate and register addressing modes.	**[L3][CO3][5M]**
	b)	Write an ALP to put the number 8DH in RAM locations 3050H and 3054H.	**[L3][CO3][5M]**
11	**a)**	Develop an assembly program of 8051 microcontroller for addition of two 8-bit numbers in internal memory location 30H and 40H and store the result in a memory location 50H.	**[L3][CO3][5M]**
	b)	Give three different ways to clear the contents of the ‘A’ register.	**[L2][CO2][5M]**

UNIT V

INTERFACING MICROCONTROLLER

PART-A (2 MARKS)

1	**a)**	Define TMOD register in 8051.	**[L1][CO2][2M]**
	b)	What is the difference between Timer and Counter in 8051?	**[L1][CO2][2M]**
	c)	What is an Interrupt Service Routine (ISR)?	**[L1][CO2][2M]**
	d)	Define key debouncing.	**[L1][CO4][2M]**
	e)	Define a step angle in stepper motor.	**[L1][CO4][2M]**

PART-B (10 MARKS)

2		Explain the different modes of 8051 timers with neat diagrams. Write an assembly language program to generate a 1ms delay using Timer 1.	**[L2][CO3][10M]**
3		Describe the working of the 8051 serial communication system. How is the baud rate generated using Timer 1? Write an example program for transmitting "HELLO".	**[L2][CO3][10M]**
4		Discuss the types of interrupts in the 8051 microcontrollers. Explain the interrupt vector table and the role of IE and IP registers with an example program.	**[L2][CO2][10M]**
5		Explain the interfacing of a 16×2 LCD with the 8051 microcontroller. Write the steps and initialization commands required to display `"WELCOME"`.	**[L2][CO6][10M]**
6		How is a 4×4 matrix keyboard interfaced with the 8051? Explain the row–column scanning technique with an example program to detect a key press.	**[L2][CO6][10M]**
7		Explain the interfacing of an ADC0809 with the 8051 microcontrollers. Draw the block diagram and write a program to read analog voltage values.	**[L2][CO6][10M]**
8		Describe how DAC0808 is interfaced with 8051. Explain the procedure to generate a triangular waveform using DAC. Also, mention how a temperature sensor (LM35) can be interfaced.	**[L2][CO6][10M]**
9	**a)**	Explain in detail how 8051 interfaces with external program and data memory.	**[L2][CO4][5M]**
	b)	State the function of ALE and PSEN pins in external memory interfacing.	**[L1][CO6][5M]**
10		Explain the interfacing of a stepper motor with 8051 using ULN2003 driver IC. Write the sequence of operations required to rotate the motor clockwise and anticlockwise.	**[L2][CO6][10M]**
11	**a)**	Compare PIC Microcontroller and ARM Processors.	**[L5][CO5][5M]**
	b)	Discuss the advantages and disadvantages of Microprocessors compared to Microcontrollers.	**[L2][CO5][5M]**

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QUESTION BANK (OBJECTIVE)

Subject with Code: (23EC0414)

Course & Branch: B.Tech & CSE, ECE

Year & Sem: III-B.Tech.& I-Sem. **Regulation:** R23

UNIT –III

1.	What is the function of RAM in 8086 interfacing?				
	a) Permanent storage	b) Temporary data storage during execution	c) Control device	d)Communication interface	[b]
2.	ROM is used for ____.				
	a) Temporary data storage	b) Arithmetic operations	c) Permanent storage of programs	d) Data transfer	[c]
3.	Intel 8255 is a ____.				
	a) DMA Controller	b) Programmable Peripheral Interface	c) USART	d) Interrupt Controller	[b]
4.	How many ports does 8255 PPI have?				
	a) 1	b) 2	c) 3	d) 4	[c]
5.	A switch interfaced with the 8086 provides ____.				
	a) Analog signal	b) Digital input to microprocessor	c) Interrupt signal only	d) Data storage	[b]
6.	LEDs are used in microprocessor interfacing for ____.				
	a) Data input	b) Data output display	c) Memory expansion	d) Serial communication	[b]
7.	A seven-segment display shows data in .				
	a) Binary	b) Decimal	c) Hexadecimal	d) All of the above	[b]
8.	Software interrupt in 8086 microprocessor is triggered by ____.				
	a) External device	b) CPU instruction	c) Peripheral device	d) DMA controller	[b]
9.	Intel 8251 is used for .				
	a) Parallel communication	b) Serial communication	c) Memory interfacing	d) Interrupt handling	[b]
10.	The primary purpose of Intel 8237A is to ____.				[b]

	a) Perform arithmetic operations	b) Enable direct memory access	c) Generate clock pulses	d) Manage I/O ports	
11.	Stepper motors are used for _.				
	a) Continuous rotation	b) Precise position control	c) Data transfer	d) Serial communication	[b]
12.	A/D Converter converts ____.				
	a) Digital signal to Analog signal	b) Analog signal to Digital signal	c) Memory data to I/O data	d) Interrupt to data	[b]
13.	D/A Converter converts ____.				
	a) Digital signal to Analog signal	b) Analog signal to Digital signal	c) Memory data to I/O data	d) Data to interrupt	[a]
14.	Intel 8259 is a ____.				
	a) USART	b) DMA Controller	c) Programmable Interrupt Controller	d) Timer	[c]
15.	In Intel 8259, IRQ stands for ____.				
	a) Interrupt Requesty7	b) Internal Queue	c) Input Register	d) Interrupt Relay	[a]
16.	HOLD and HLDA signals are used in ____.				[b]
	a) Interrupt handling	b) DMA transfer	c) USART communication	d) Memory interfacing	
17.	In 8255 PPI, Port C is used for ____.				
	a) Analog input	b) 8-bit data port only	c) Control and status signals	d) Clock generator	[c]
18.	8251 USART supports ____.				
	a) Parallel transmission only	b) Synchronous and Asynchronous modes	c) DMA only	d) Interrupt-driven mode only	[b]
19.	Which of the following is true for DMA operation?				
	a) CPU handles all data transfers	b) Memory handles data transfers	c) DMA controller transfers data directly	d) I/O devices cannot use DMA	[c]
20.	Stepper motors move in ____.				
	a) Continuous motion	b) Analog steps	c) Fixed digital steps	d) Random motion	[c]
21.	A/D Converter resolution refers to ____.				
	a) Speed of conversion	b) Input voltage range	c) Number of bits in digital output	d) Sampling rate	[c]
22.	Seven-segment display is controlled by ____.				[a]

	a) 8255 PPI	b) 8251 USART	c) 8259 PIC	d) 8237 DMA	
23.	Control word in 8255 defines ____.				[b]
	a) Data bus width	b) Mode of operation	c) Clock speed	d) Interrupt priority	
24.	In Intel 8259, the highest priority interrupt is ____.				[b]
	a) IRQ7	b) IRQ0	c) IRQ15	d) IRQ1	
25.	8086 microprocessor can address ____.				[c]
	a) 64 KB	b) 128 KB	c) 1 MB	d) 512 KB	
26.	HOLD signal indicates ____.				[b]
	a) CPU requesting bus	b) DMA controller requesting system bus	c) Peripheral interrupt	d) Memory write operation	
27.	USART stands for ____.				[b]
	a) Universal Serial Arithmetic Transmitter	b) Universal Synchronous/Asynchronous Receiver Transmitter	c) Uniform Serial Asynchronous Receiver Transmitter	d) Universal Storage Access Register	
28.	In A/D conversion, sampling is done to ____.				[b]
	a) Increase analog resolution	b) Convert analog signal to discrete digital values periodically	c) Store analog signal	d) Filter signal noise	
29.	8259 PIC is used to ____.				[b]
	a) Manage serial communication	b) Prioritize multiple interrupt requests	c) Generate clock signals	d) Interface memory	
30.	Why is interfacing needed in microprocessor systems?				[b]
	a) To speed up processing	b) To connect microprocessor to external devices	c) To increase memory size	d) To perform arithmetic operations	
31.	How many bytes are transferred in one 8237 DMA cycle?				[a]
	a) 1	b) 2	c) 4	d) 8	
32.	8251 USART transmits data at a predefined clock rate in ____.				[b]
	a)Asynchronous mode	b) Synchronous mode	c) Parallel mode	d) Control mode	
33.	Stepper motors are controlled by ____.				[b]
	a) Analog signals	b) Digital pulse signals	c) Interrupt signals	d) Address lines	
34.	8255 PPI Mode 0 is ____.				[c]
	a) Bi-directional mode	b) Strobed I/O mode	c) Simple I/O mode	d) Interrupt mode	

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35.	Control word in Intel 8259 is used to ____.				[a]
	a) Program interrupt vector and modes	b) Transfer data	c) Set DMA channel	d) Manage USART baud rate	
36.	A/D and D/A converters interface ____.				[c]
	a) Only digital devices	b) Only analog devices	c) Analog and digital devices	d) Memory and CPU only	
37.	When an interrupt occurs in 8086, the microprocessor ____.				[a]
	a) Executes ISR	b) Resets	c) Waits indefinitely	d) Ignores it	
38.	Pin used by Intel 8259 to send interrupt to 8086 is ____.				[b]
	a) IRQ0	b) INTR	c) INT	d) RESET	
39.	Address bus width of 8086 is ____.				[c]
	a) 8-bit	b) 16-bit	c) 20-bit	d) 32-bit	
40.	Intel 8259 PIC is important because ____.				[b]
	a) Increases memory size	b) Handles multiple interrupts and prioritizes them	c) Controls arithmetic operations	d) Converts analog to digital data	

UNIT- IV

1.	The 8051 microcontroller is of ____-bit.				[b]
	a) 4-bit	b) 8-bit	c) 16-bit	d) 32-bit	
2.	How many parallel I/O ports are available in 8051?				[c]
	a) 2	b) 3	c) 4	d) 5	
3.	The size of on-chip RAM in standard 8051 is:				[b]
	a)64 bytes	b)128 bytes	c)256 bytes	d)512 bytes	
4.	Which timers are available in the 8051?				[c]
	a)one 16-bit timer	b)Two 8-bit timers	c)Two 16-bit timers	d)One 32-bit timer	
5.	The 8051 microcontroller has how many exernal interrupt sources?				[a]
	a)2	b)3	c)4	d)5	
6.	The accumulator register in 8051 is:				[b]
	a)B-register	b)ACC	c)PSW	d)SP	
7.	The PSW register stores:				[b]
	a)Program Counter	b)ALU flags and status	c)Stack pointer	d)Data pointer	

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8.	Stack Pointer (SP) default value after reset is:				[c]
	a)00H	b)07H	c)08H	d)FFH	
9.	The SFR at address 90H is:				[b]
	a)P0	b)P1	c)P2	d)P3	
10.	Which SFR is used to enable interrupts?				[a]
	a)IE	b)IP	c)TCON	d)TMOD	
11.	Port 0 is an open-drain port.To -output logic 1,it requires:				[b]
	a)Internal pull-up	b)External pull-up	c)Nothing	d)Pull-down resistor	
12.	Port 2 is primarily used for:				[b]
	a) Low-order address	b) High-order address/data in external memory	c) Serial communication	d) Interrupt control	
13.	Port 3 pin P3.0 is used as:				[b]
	a) T0	b)RXD	c)INT0	d)ALE	
14.	How many pins are there in 8051 microcontroller?				[c]
	a) 28	b)32	c)40	d)64	
15.	Which port requires external pull-ups to operate as output?				[d]
	a) P1	b)P2	c)P3	d)P0	
16.	Instruction `MOV A, #30H` is:				[a]
	a) Data transfer – immediate	b) Arithmetic	c)Branch	d)Logical	
17.	`ADD A, R0` is an example of:				[b]
	a)Logical	b) Arithmetic	c) Branching	d)Control	
18.	Which instruction clears the accumulator?				[a]
	a)CLR A	b) CPL A	c) ANL A	d) ORL A	
19.	Which instruction is used to call a subroutine?				[b]
	a)LJMP	b) ACALL	c) SJMP	d) RET	
20.	`SETB P1.0` is an example of:				[a]
	a)Bit manipulation	b) Arithmetic	c) Data transfer	d) Branching	
21.	`MOV A, #45H` uses which addressing mode?				[b]
	a) Direct	b) Immediate	c) Register	d) Indirect	
22.	`MOV A, R1` uses which addressing mode?				[c]
	a)Immediate	b) Direct	c) Register	d) Indirect	
23.	`MOV A, @R0` is an example of:				[d]
	a)Immediate	b) Direct	c) Register	d) Register Indirect	
24.	`MOVC A, @A+DPTR` is used for:				[b]
	a) Data memory access	b) Program memory access	c) Register operations	d) I/O port access	
25.	`SETB C` operates on:				[a]

	a) Bit addressing mode	b) Immediate	c) Direct	d) Register	
26.	Which directive specifies the starting address of a program?				[b]
	a) END	b) ORG	c) EQU	d) DB	
27.	Instruction to increment accumulator by 1:				[a]
	a) INC A	b) ADD A, #1	c) SUBB A, #1	d) DEC A	
28.	To move the contents of R0 to accumulator:				[b]
	a) MOV A, #R0	b) MOV A, R0	c) MOV R0, A	d) ADD A, R0	
29.	To end an assembly program, we use:				[b]
	a) ORG	b) END	c) JMP	d) RET	
30.	What is the purpose of `ANL A, #0FH`?				[b]
	a) Clears lower nibble	b) Clears higher nibble	c) Sets carry	d) Increment accumulator	
31.	Timer 0 in 8051 is a:				[b]
	a) 8-bit timer	b)16-bit timer	c)32-bit timer	d)4-bit timer	
32.	TMOD register configures:				[b]
	a)Interrupt priorities	b) Timer mode	c) Port direction	d) Serial communication	
33.	TCON register is used to:				[b]
	a)Enable/disable interrupts	b) Control timers and external interrupts	c) Set accumulator	d) Program memory access	
34.	How many levels of interrupt priority can 8051 support?				[b]
	a)1	b)2	c)3	d)4	
35.	Which instruction is used to return from interrupt?				[b]
	a) RET	b) RETI	c) LJMP	d) NOP	
36.	The serial control register is:				[a]
	a) SCON	b) IE	c) TCON	d) TMOD	
37.	Which port pin can be used for serial transmit (TXD)?				[b]
	a) P3.0	b) P3.1	c) P1.0	d) P2.0	
38.	Maximum external memory that can be interfaced with 8051 is:				[a]
	a) 64 KB program + 64 KB data	b)32 KB program + 32 KB data	c)128 KB program + 64 KB data	d)256 KB program + 64 KB data	
39.	Instruction `DJNZ R0, LABEL` is used for:				[b]
	a)Data transfer	b) Loop decrement and branch	c) Arithmetic	d) Logical	
40.	Default state of Port 1 pins after reset is:				[b]
	a) Logic 0	b) Logic 1	c) High impedance	d) Floating	

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UNIT- V

1.	8051 Timers are used for ____.				[b]
	a)Data storage	b) Delay generation and event counting	c) Power supply	d) Serial communication	
2.	Which mode of 8051 Timer is used for generating delays?				[b]
	a) Mode 0	b)Mode 1	c)Mode 2	d)Mode 3	
3.	In serial port programming of 8051, the SBUF register is used for ____.				[c]
	a) Storing Timer values	b) Baud rate control	c) Transmitting and receiving data	d) Interrupt control	
4.	The maximum baud rate supported by 8051 in standard mode is ____.				[a]
	a)9600 bps	b)115200 bps	c)2400 bps	d)4800 bps	
5.	Which interrupt in 8051 is triggered by external hardware?				[c]
	a) Timer interrupt	b) Serial interrupt	c) External interrupt	d) Software interrupt	
6.	In LCD interfacing, the RS pin controls ___.				[c]
	a) Power supply	b) Read/Write selection	c) Command/Data selection	d) Display brightness	
7.	A standard keypad matrix is arranged in ____.				[b]
	a)2x2	b)4x4	c)3x3	d)5x5	
8.	ADC stands for ____.				[b]
	a) Analog Data Converter	b) Analog to Digital Converter	c) Automatic Digital Control	d) Analog Digital Channel	
9.	Which of the following is a common resolution for ADC?				[d]
	a)4-bit	b)8-bit	c)12-bit	d) All of the above	
10.	DAC converts ____.				[b]
	a) Analog signal to digital signal	b) Digital signal to analog signal	c) Data to instructions	d) Interrupts to data	
11.	Temperature sensor commonly used with microcontrollers is ____.				[c]
	a) LDR	b) Thermistor	c) LM35	d) Relay	
12.	External memory interfacing is used to ____.				[a]
	a) Expand RAM and ROM capacity	b) Increase CPU speed	c) Reduce power consumption	d) Enhance display resolution	
13.	In external memory interfacing, ALE pin of 8051 is used for ____.				[a]
	a) Address latch enable	b) Clock signal	c) Data storage	d) Interrupt control	
14.	Memory-mapped I/O uses ____.				[b]

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	a) Separate address space for I/O	b) Same address space as memory	c) No addressing	d) DMA controller	
15.	I/O-mapped I/O is also called ____.				
	a) Memory-mapped I/O	b) Isolated I/O	c) Direct Memory Access	d) Peripheral Memory	[b]
16.	Stepper motors advance in ____.				[b]
	a) Continuous rotation	b) Fixed angle steps	c) Analog signals	d) Random steps	
17.	Microcontroller generates waveforms using ____.				
	a) ADC only	b) DAC and timer	c) Memory-mapped I/O	d) Interrupts only	[b]
18.	Which waveform is easiest to generate in software?				
	a) Sine wave	b) Square wave	c) Triangle wave	d) Sawtooth wave	[b]
19.	Microprocessor differs from microcontroller because ____.				
	a)Microprocessor has on-chip RAM	b) Microcontroller integrates RAM, ROM, and I/O ports	c) Microprocessor is used in embedded systems	d)Microcontroller has higher power consumption	[b]
20.	PIC stands for ____.				
	a) Peripheral Interface Controller	b) Programmable Interface Controller	c) Peripheral Integrated Chip	d) Programmable Intelligent Chip	[a]
21.	Which of the following is NOT an ARM processor feature?				
	a) RISC architecture	b) Low power consumption	c) High instruction cycles	d) Wide peripheral support	[c]
22.	8051 Timer 0 operates in which modes?				[a]
	a) Mode 0, 1, 2, 3	b) Only Mode 0	c) Mode 1 and 2	d) Mode 1 only	
23.	Serial communication in 8051 is controlled by ____.				[b]
	a) Timer 0	b) SCON register	c) TCON register	d) PSW register	
24.	An interrupt in 8051 ____.				
	a) Stops program execution	b) Executes a predefined routine	c) Is software-generated only	d) Does not alter execution flow	[b]
25.	In LCD interfacing, the E (Enable) pin ____.				
	a) Turns the display on and off	b) Provides timing to latch data	c) Controls data/command selection	d) Resets the microcontroller	[b]
26.	Keypad matrix scanning is done by ____.				[b]

	a) Interrupts	b) Polling rows and columns	c) DMA transfer	d) Timer interrupts	
27.	Which ADC type is commonly used with 8051 ?				
	a) Flash ADC	b) Successive Approximation ADC	c) Sigma-Delta ADC	d) Integrating ADC	[b]
28.	LM35 sensor provides ____.				
	a) Digital temperature data	b) Analog voltage proportional to temperature	c) Digital humidity data	d) Analog current proportional to pressure	[b]
29.	External memory interface in 8051 is accessed via ____.				
	a) Internal RAM only	b) PSEN and ALE pins	c) Stack pointer	d) Serial port	[b]
30.	In waveform generation, square wave is generated using ____.				
	a) ADC	b) DAC and timers	c) Interrupt controller	d) Memory-mapped I/O	[b]
31.	Microcontroller has ____.				
	a) No built-in peripherals	b) Built-in RAM, ROM, and I/O ports	c) External-only peripherals	d) Only CPU and no memory	[b]
32.	PIC microcontrollers are popular due to ____.				
	a) High power consumption	b) Low cost and ease of use	c) Complex architecture	d) Large size	[b]
33.	ARM processors are based on ____.				
	a) CISC architecture	b) RISC architecture	c) Von Neumann architecture	d) Harvard architecture	[b]
34.	Timer interrupts are used for ____.				
	a) Memory expansion	b) Generating precise time delays	c) Serial communication	d) Stepper motor control	[b]
35.	8051 external interrupts are labeled as ____.				
	a) INT0 and INT1	b) T0 and T1	c) EA and EX0	d) RST and ALE	[a]
36.	In DAC, input is ____.				
	a) Analog voltage	b) Digital binary data	c) Sensor signal	d) Interrupt vector	[b]
37.	Waveform generation can be achieved using ____.				
	a) ADC only	b) Timers and DAC	c) EEPROM	d)LCD controller	[b]
38.	Microprocessor differs from microcontroller in ____.				[a]

	a) Having no RAM and ROM integrated	b) Operating at lower frequency	c) Built-in ADC	d) Controlling devices only	
39.	Serial Port Programming uses the ____.				
	a) Timer registers	b) SCON and SBUF registers	c) ADC registers	d) Interrupt vector table	[b]
40.	LCD interfacing generally requires ____.				
	a) 8 data lines only	b) Control and data lines (at least 6 pins)	c) No external control lines	d) Analog inputs	[b]