

# University of Mumbai

## Question Bank

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2019

Examination: SE Semester IV

Course Code: ELC403 and Course Name: Microcontroller Applications

Max. Marks: 80

Each question carry 02 Marks	
1.	8051 series has how many 16 bit registers?
Option A:	2
Option B:	3
Option C:	1
Option D:	0
2.	When the microcontroller executes some arithmetic operations, then the flag bits of which register are affected?
Option A:	SP
Option B:	DPTR
Option C:	PSW
Option D:	PC
3.	What is the order decided by a processor or the CPU of a controller to execute an instruction?
Option A:	Decode, Fetch, Execute
Option B:	Execute, Fetch, Decode
Option C:	Fetch, Execute, Decode
Option D:	Fetch, Decode, Execute
4.	What is the meaning of the instruction MOV A,05H for 8051
Option A:	Data 05H is stored in the accumulator
Option B:	Contents of the address 05H is stored in the accumulator
Option C:	Fifth bit of accumulator is set to one
Option D:	Data 05H is stored in B register.
5.	Which out of the four ports of 8051 needs a pull-up resistor for using it as an input or an output port?
Option A:	PORT 0
Option B:	PORT 1
Option C:	PORT 2
Option D:	PORT 3
6.	Which addressing mode is used in pushing or popping any element on or from the stack?
Option A:	Immediate
Option B:	Direct
Option C:	Indirect
Option D:	Register

7.	Which operator is used while assigning any instruction as register indirect instruction?
Option A:	\$
Option B:	#
Option C:	@
Option D:	&
8.	When we add two numbers the destination must always be.
Option A:	Some immediate data
Option B:	Any register
Option C:	Accumulator
Option D:	Memory
9.	XRL, ORL, ANL commands have _____
Option A:	Either accumulator or 8-bit direct address as the destination and register, memory or any immediate data as the source
Option B:	Only accumulator as the destination and any immediate data as the source
Option C:	Only accumulator as the destination and any register, memory or any immediate data as the source
Option D:	Any register as the destination and only immediate data as the source
10.	What is the frequency of the clock that is being used as the clock source for the timer?
Option A:	Externally applied frequency f
Option B:	Controller's crystal frequency f
Option C:	Controller's crystal frequency /24
Option D:	Controller's crystal frequency /12
11.	What is the function of the TMOD register?
Option A:	TMOD register is used to load the count of the timer
Option B:	Is used to enable/disable timer interrupts
Option C:	Is used to interrupt the timer
Option D:	TMOD register is used to set various operation modes of timer/counter
12.	If Timer 0 is to be used as a counter, then which pin is used as input for counting asynchronous events.
Option A:	P3.3
Option B:	P3.4
Option C:	P3.5
Option D:	P3.6
13.	Which register is used for holding data during serial communication in 8051.
Option A:	SMOD
Option B:	PCON
Option C:	SBUF
Option D:	SCON
14.	Which pin of Port 3 of 8051 is used as #INT 0 interrupt?
Option A:	P3.0
Option B:	P3.1

Option C:	P3.2
Option D:	P3.3
15.	How many rows and columns are present in a 16*2 alphanumeric LCD?
Option A:	Rows=2, Columns=32
Option B:	Rows=16, Columns=2
Option C:	Rows=16, Columns=16
Option D:	Rows=2, Columns=16
16.	What is the function of the STC pin in ADC?
Option A:	Its active high input used to inform ADC to end the conversion
Option B:	Its active low input used to inform ADC to the end the conversion
Option C:	Its active low input used to inform ADC to the start the conversion
Option D:	Its active high input used to inform ADC to the start the conversion
17.	The byte to be programmed into IP register for giving higher priority to all the interrupts is
Option A:	0FH
Option B:	0EH
Option C:	1FH
Option D:	00H
18.	Which of the following is used for header files?
Option A:	#include
Option B:	file
Option C:	struct()
Option D:	proc()
19.	Assembler is used for _____
Option A:	Converting higher level language program to machine language
Option B:	Converting assembly language program to machine language
Option C:	To link object files
Option D:	To debug the program
20.	Which port of 8051 is used as AD0-AD7.
Option A:	PORT 0
Option B:	PORT 1
Option C:	PORT 2
Option D:	PORT 3
21.	8051 has _____ of ROM and _____ of RAM on chip
Option A:	64 KB, 4 KB
Option B:	60 KB, 4 KB
Option C:	8 KB, 128 Bytes
Option D:	4 KB, 128 Bytes
22.	8051 has _____ i/o ports of _____ each
Option A:	3, 8 bit
Option B:	4, 8 bit
Option C:	4, 16 bit
Option D:	2, 16 bit

23.	Which architecture provides common memory for program as well as data
Option A:	Harvard
Option B:	Von Neumann
Option C:	Harvard as well as Von Neumann
Option D:	Harvard derivatives
24.	The instruction MOVX A,@DPTR comes under _____ addressing mode
Option A:	Register
Option B:	Immediate
Option C:	Register Indirect
Option D:	Direct
25.	If A=0FH, B=0FH then on the execution of XRL A,B result in A will be
Option A:	00H
Option B:	0Fh
Option C:	F0H
Option D:	FFH
26.	If R0=35H and contents of the internal RAM [35H]=25H then on the execution of MOV A, @R0 contents of A will be
Option A:	35H
Option B:	25H
Option C:	70H
Option D:	00H
27.	The number of address and data lines available on 8051 are
Option A:	8-bit & 16-bit each
Option B:	8-bit & 8-bit each
Option C:	16-bit & 8-bit each
Option D:	16-bit & 16-bit each
28.	The counter inputs T0 & T1 are provided by which 2-port lines of 8051
Option A:	P3.4 & P3.5
Option B:	P3.6 & P3.7
Option C:	P3.2 & 3.3
Option D:	P3.0 & P3.1
29.	Which modes of the serial port of 8051 has fixed baud rate
Option A:	Mode 1 & Mode 3
Option B:	Mode 2 & Mode 3
Option C:	Mode 0 & Mode 2
Option D:	Mode 0 & Mode 1
30.	'Const' and 'Volatile' are the 2 types of _____ in Embedded C?
Option A:	Qualifiers
Option B:	Modifiers
Option C:	Data Types
Option D:	Integers

31.	To program Timer/Counter 0 as Timer in Mode 1, the TMOD is programmed with _____
Option A:	#08H
Option B:	#04H
Option C:	#0AH
Option D:	#01H
32.	The baud rate of the serial port in 8051 is _____ by setting the SMOD bit of PCON
Option A:	Halved
Option B:	Doubled
Option C:	Quadrupled
Option D:	Tripled
33	Triggering level for #INT 0 & #INT 1 are programmed with _____ SFR
Option A:	TMOD
Option B:	TCON
Option C:	IE
Option D:	IP
34.	If the oscillator frequency is 12MHz, what will be the count value to be programmed in Timer-1 for the generation of 5 millisecond delay?
Option A:	TH1= 13H, TL1=88H
Option B:	TH1= 3CH, TL1=AFH
Option C:	TH1= FEH, TL1=0CH
Option D:	TH1= ECH, TL1=78H
35	If equal priority is assigned for all the interrupts, which interrupt will be served first in 8051
Option A:	#INT 0
Option B:	#INT 1
Option C:	TFO
Option D:	TF1
36.	The Vector Address for Timer-0, overflow interrupt is _____
Option A:	001BH
Option B:	0013H
Option C:	000BH
Option D:	0003H
37.	Which port of 8051 requires external pullups
Option A:	Port 0
Option B:	Port 1
Option C:	Port 2
Option D:	Port 3
38.	If 8051 has Oscillator Frequency of 12MHz, then time for 1-machine cycle will be _____
Option A:	0.889 $\mu$ s
Option B:	1.2 $\mu$ s

Option C:	0.667 $\mu$ s
Option D:	1 $\mu$ s
39.	The 8051 controller does not have _____ on chip
Option A:	128 bytes of RAM
Option B:	4KB of ROM
Option C:	ADC
Option D:	2, 16 bit Timer/Counters
40.	User programmable bit is the part of data frame communicated in which modes of the serial port of 8051
Option A:	Mode 0 & Mode 1
Option B:	Mode 2 & Mode 3
Option C:	Mode 0 & Mode 2
Option D:	Mode 1 & Mode 2
41.	How many bytes of bit addressable memory is present in 8051 based microcontrollers?
Option A:	32 bytes
Option B:	8 bytes
Option C:	16 bytes
Option D:	128 bytes
42.	Name the architecture and the instruction set for microcontroller 8051?
Option A:	Von- Neumann Architecture with RISC Instruction Set
Option B:	Harvard Architecture with CISC Instruction Set
Option C:	Harvard Architecture with RISC Instruction Set
Option D:	Von- Neumann Architecture with CISC Instruction Set
43.	SBUF in serial port is used for which operation?
Option A:	Controlling
Option B:	Transferring and receiving serial data
Option C:	Mode selection
Option D:	Controlling and transferring
44.	Which register is used for programming modes of the serial port
Option A:	SCON
Option B:	SBUF

Option C:	PCON
Option D:	SMOD
45.	Which instruction belongs to indexed addressing mode
Option A:	MOVX A ,@DPTR
Option B:	MOVC A, @A+DPTR
Option C:	MOV A ,@R0
Option D:	MOV @R0, 25H
46.	The maximum amount of external memory (RAM & ROM) that can be interfaced to 8051 is:
Option A:	128 KB
Option B:	256 KB
Option C:	64 KB
Option D:	32 KB
47.	Which among the below stated registers are not involved with programming of serial port.
Option A:	TL1 & TH1
Option B:	TCON & TMOD
Option C:	SCON & PCON
Option D:	SP & PC
48.	Which directive is used to indicate the beginning of the address for program or data?
Option A:	DB
Option B:	ORG
Option C:	END
Option D:	EQU
49.	Which among the below mentioned reasons is responsible for the generation of Serial Port Interrupt?

Option A:	Overflow of timer/counter 1
Option B:	High to low transition on pin #INT1
Option C:	Setting of either TI or RI flag
Option D:	Overflow of timer/counter 0
50.	Which among the below mentioned sequence of program instructions represent the correct chronological order to be repeated for the generation of 50Hz square wave frequency?  1.MOV TMOD, #20H 2. SETB TR1 3. MOV TH1,#0D8H 4.CPL P1.1 5.MOV TL1,#0F0H 6..ORG 0000H
Option A:	6,5,2,4,1,3
Option B:	6,2,4,5,1,3
Option C:	6,1,5,3,2,4
Option D:	6,5,4,3,2,1
51.	Which of the SFR's are required to program serial communication in mode 1 with specified baud rate
Option A:	SBUF, SCON
Option B:	SBUF, SCON, TMOD, TCON, TH1
Option C:	TMOD, TCON, TH1
Option D:	SCON , SBUF,IE
52.	Abbreviation CISC and RISC stands for
Option A:	Complex Instruction Set Computer; Reduced Instruction Set Computer
Option B:	Complete Instruction Set Computer; Reliable Instruction Set Computer
Option C:	Complex Instruction Set Computer; Reliable Instruction Set Computer
Option D:	Complete Instruction Set Computer; Reduced Instruction Set Computer

53.	What is the time taken by one machine cycle if crystal frequency is 11.0592 MHz?
Option A:	921.1us
Option B:	256us
Option C:	1.085us
Option D:	1us
54.	What is the count value to be loaded into the TH0 and TL0 registers to generate a delay of 50ms, use mode 1 and consider the oscillator frequency as 12 MHz
Option A:	3CB0H
Option B:	C350H
Option C:	0000H
Option D:	FDA0H
55.	What is the divisional range of program memory for internal and external memory portions respectively when the enable access pin is held high (+5V)?
Option A:	0000H-1000H & 0FFFH-FFFFH
Option B:	0000H-0FFFH & 1000H-FFFFH
Option C:	0000H-00FFH & 0100H-FFFFH
Option D:	0001H-0FFFH & 01FFH-FFFFH
56.	The CPU clock frequency for 8051 is ____ of oscillator frequency.
Option A:	1/12
Option B:	1/6
Option C:	1/2
Option D:	1/4
57.	8051 microcontroller uses status of Auxiliary carry during operation of instruction
Option A:	XCH R1
Option B:	DA A
Option C:	ADDC A,#DATA

Option D:	SUBB A,#DATA
58.	When an interrupt is enabled, then where does the pointer moves immediately after this interrupt has occurred?
Option A:	to the next instruction which is to be executed
Option B:	to the end of the program
Option C:	to the last instruction of ISR
Option D:	to a fixed location in memory called as interrupt vector
59.	Auto reload operation is allowed in which mode of Timer
Option A:	mode 1
Option B:	mode 2
Option C:	mode 3
Option D:	mode 0
60.	How many times will the instruction 'DJNZ R1,HERE' be executed?  MOV R1,#255  HERE: DJNZ R1,HERE  END
Option A:	256
Option B:	255
Option C:	254
Option D:	INFINITE

### Subjective Type Questions

<b>Each Questions carry 5 marks</b>	
1	Explain following instructions of 8051. 1) MOV A, @R1 2) DJNZ R5, Back 3) XRL A, #0FH
2	Write a delay routine for 5 msec using Timer/Counter-1 of 8051.
3	Explain Internal memory organization of 8051.
4	Explain Data types and Modifiers in Embedded C.
5	Draw neat 4X4 matrix keyboard interfacing diagram with 8051 (Only Interface Diagram)
6	Compare RISC and CISC architecture.
7	Differentiate between RISC and CISC architecture

8	Write a note on Addressing modes of 8051
9	Discuss Power Saving Modes of 8051
10	Discuss the terms, 'Data Types', 'Modifiers', Qualifiers' related to Embedded C Programming.
11	Write a note on 'Memory Organization' in 8051
12	What are 'Assembler Directives'? Explain with the examples.
13	Explain T-state, Machine cycle, Instruction cycle with proper diagram.
14	Write a C program to generate a square wave of 500 Hz on port pin P2.5.
15	Explain the operation of the following Instruction i) DJNZ R0,UP ii) MOVC A,@A+DPTR iii) ORL A,#05H iv) WAIT:JNB TF1,WAIT v)SUBB A,#35H
16	Write 8051 assembly language program to transfer 'WELCOME' serially. Use 9600 baud rate to transfer the data. Assume oscillator frequency as 12MHz.
17	Explain the SFRs required for the 8051 interrupt programming.
18	Compare Harvard and Von Neumann Architectures

	<b>Each Question carry 10 marks</b>
1	Explain the Interrupt structure of 8051 Microcontroller with register used.
2	Interface a 7-segment led display with 8051, draw the logic interface diagram and write a assembly language program to display numbers from 0 to 9 continuously.
3	Draw and explain internal port structure of 8051 microcontroller.
4	Design 8051 based system with following specifications. (i) 8051 CPU operating at 6 MHz (ii) 32 KB of RAM using 16 KB chips (iii) 8 KB of EPROM using 4 KB chips Design the system with proper interface diagram and memory map Note: #EA pin is grounded
5	Interface 8 bit DAC with 8051, draw the logic interface diagram and write an embedded C program to generate continues rectangular wave of frequency 1KHz and duty cycle 40%. Assume the crystal clock frequency of 8051 as 12 MHz.
6	Interface a 4 phase stepper motor with 8051, draw the logic interface and write an assembly language program to rotate the motor clock wise and anti-clock wise repeatedly for infinite time. Stepping patterns for the stepper motor to rotate clock wise are given as 05H,06H,0AH,09H.
7	Design a 8051 based system with 16k bytes of ROM & 32k bytes of RAM. Interface the memory such that the starting address for ROM is 0000H &

	RAM is 8000H.
8	Explain power saving modes of 8051 in detail.
9	Interface stepper motor with 8051 controller and write assembly program to rotate it in an anticlockwise direction continuously. Consider the motor as 4-phase and switching patterns as 05H,06H,0AH,09H.