

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from June 01, 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2019

Examination: SE Semester IV

Course Code: ELC403 and Course Name: Microcontroller Applications

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	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
2.	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
3.	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
4.	The instruction MOVX A,@DPTR comes under _____ addressing mode
Option A:	Register
Option B:	Immediate
Option C:	Register Indirect
Option D:	Direct
5.	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:	FOH
Option D:	FFH
6.	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
7.	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
8.	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
9.	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
10.	'Const' and 'Volatile' are the 2 types of _____ in Embedded C?
Option A:	Qualifiers
Option B:	Modifiers
Option C:	Data Types
Option D:	Integers
11.	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
12.	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
13.	Triggering level for #INT 0 & #INT 1 are programmed with _____ SFR
Option A:	TMOD
Option B:	TCON
Option C:	IE
Option D:	IP
14.	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
15.	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
16.	The Vector Address for Timer-0, overflow interrupt is _____
Option A:	001BH
Option B:	0013H
Option C:	000BH
Option D:	0003H
17.	Which port of 8051 requires external pullups
Option A:	Port 0
Option B:	Port 1
Option C:	Port 2
Option D:	Port 3
18.	If 8051 has Oscillator Frequency of 12MHz, then time for 1-machine cycle will be _____
Option A:	0.889 μ s
Option B:	1.2 μ s
Option C:	0.667 μ s
Option D:	1 μ s
19.	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
20.	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

Q2 (20 Marks)	Solve any Four	(5 Marks each)
A	Differentiate between RISC and CISC architecture	
B	Write a note on Addressing modes of 8051	
C	Discuss Power Saving Modes of 8051	
D	Discuss the terms, 'Data Types', 'Modifiers', Qualifiers' related to Embedded C Programming.	
E	Write a note on 'Memory Organization' in 8051	
F	What are 'Assembler Directives'? Explain with the examples.	

Q3 (20 Marks)	Solve any Two	(10 Marks each)
A	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	
B	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.	
C	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.	

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Q1:

Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	D
Q2.	B
Q3.	B
Q4	C
Q5	A
Q6	B
Q7	C
Q8.	A
Q9.	C
Q10.	A
Q11.	D
Q12.	B
Q13.	B
Q14.	D
Q15.	A
Q16.	C
Q17.	A
Q18.	D
Q19.	C
Q20.	B

Q3:

A

- 5 Marks for correct memory map
- 5 Marks for interface diagram with appropriate decoder

B

- 2 Marks for Neat logic interface diagram
- 8 Marks for correct program

C

- 2 Marks for Neat logic interface diagram
- 8 Marks for correct program