MICROPROCESSORS AND MICROCONTROLLERS (BECE204L)
SAMPLE QUESTIONS FOR CAT1

1. For 8051 Microcontroller, interpret the contents of various locations and the position of stack pointer after executing each and every instruction of the following code.

Line Number	Program	Contents	
1.	MOV 00H,#29H	00H :	; SP :
2.	MOV 10 H,#30H	10H :	; SP :
3.	MOV 18H,#31H	18H :	; SP :
4.	MOV SP.#29H	SP :	
5.	PUSH 00H	00H :	; SP :
6.	PUSH 18H	18H :	; SP :
7.	PUSH 30H	30H :	; SP :
8.	POP 31H	31H :	; SP :
9.	POP 18H	18H :	; SP :
10.	PUSH 18H	18H :	; SP :
11.	POP 19H	19H :	; SP :
12.	END		

2. Examine the size of delay in the following program, if the crystal frequency of 8051 microcontroller is 11.0592 MHz.

Label	Opcode	Machine Cycle
	MOVR0,#0A0h	1
L3:	MOV R1,#40h	1
L2:	MOV R3,#20h	1
L1:	DJNZ R3, L1	2
	DJNZ R1,L2	2
	DJNZ R0,L3	2
	RET	2

3. For 8051 Microcontroller, identify the error if any in the following instructions and discuss the error in detail.

i. MOV R1,R2
ii. ADD #40H,A
iii. MOV A, @R2
iv. XOR R0,23H
v. MOV C,A

4. Analyze the following code and specify the content of various registers and Program Status Word (PSW) after the execution of each instruction.

		ORG 00H	
		MOV A,#00H	**A =? PSW =?**
		MOV R5,A	**R5=?**
		MOV R0,#0F4H	**R0=?**
		ADD A,#89H	**A=? PSW=?**
		JNC N_1	
		INC R5	
N_1	**:**	**ADD A,#0A5H**	**A=? PSW =?**
		JNC N_2	
		INC R5	
N_2	**:**	**ADD A,#0E2H**	
		JNC OVER	
		INC R5	
OVER	**:**	**MOV @R0,A**	
		END	

5. The initial values of the memory location (06h-09h) are given below in the Table

Memory location	**Initial value**	**Final value**
09h	88(h)	?
08h	10(h)	?
07h	AD(h)	?
06h	67(h)	?

Identify the final values in these locations after execution of the following program.

```
ORG 00H
PUSH 06H
MOV SP, #09H
POP 06H
END
```

6. Identify the addressing mode for

a) POP 0 b) MOV A, #255 c) MUL AB d) 40H, #40H e) MOV @R1, A

7. Sketch the content of the stack after the execution of the following code:

```
PC    Opcode          Mnemonic Operand
000B 120300            LCALL DELAY
000E 80F0              SJMP BACK
0010  ; ----------this is the delay subroutine
0300                   ORG 300H
0300          DELAY:
0300  7DFF              MOV R5, #0FFH
0302  DDFE   AGAIN: DJNZ R5, AGAIN
0304  22                RET
```

8. Assume A = 79H, R0 = 94H. what is the content in A after the execution of the following instructions.

i. MOV A, R0
ii. SWAP A
iii. XCHD A, R0
iv. ADD A, R0

9. Describe binary addition using 8051 Microcontroller for the data 0FH and F0H and show the status of PSW.

10. Assume string of data is stored in code space starting at address 200H as shown below MYDATA: “VIT UNIVERSITY”. Write an 8051 ALP to transfer this string of data in reverse order i.e. “YTISREVINU TIV” to RAM locations inside the CPU starting at 40H.

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