Government College of Engineering, Amravati
(An Autonomous Institute of Government of Maharashtra)

Fifth Semester B. Tech. (Electronics and Telecom.)

Winter– 2015

Course Code: ETU504
Course Name: Microcontroller And It's Applications

Time: 2 Hrs. 30 Min **Max. Marks: 60**

Instructions to Candidate

1) All questions are compulsory.
2) Assume suitable data wherever necessary and clearly state the assumptions made.
3) Diagrams/sketches should be given wherever necessary.
4) Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5) Figures to the right indicate full marks.

1. Answer the following two marks questions 12

a) Explain the role that each of the two bits TCON.0 and TCON.2 play in the execution of external interrupts 0?
b) How are interrupts better than Polling?
c) Write a program to perform multiplication of 2 nos using 8051
d) In what ways CISC and RISC processors
e) differ?
f) Draw the circuit diagram of Motor interfacing.
What is the difference between 8051 and PIC?

2. Answer the following (Any Three) 12

a) Find the size of the delay in following program, if the crystal
frequency is 11.0592MHz.

Contd..

Machine Cycle

```
DELAY: MOV R3,#250 1
HERE: NOP 1
NOP 1
NOP 1
NOP 1
DJNZ R3,HERE 2
RET 2
```

b) Examining the stack, show the contents of the register and SP after execution of the following instructions. All value are in hex.

```
MOV SP, #5FH ;make RAM location 60H
;first stack location
MOV R2, #25H
MOV R1, #12H
MOV R4, #0F3H
PUSH 2
PUSH 1
PUSH 4
```

c) Write a program to copy the value 55H into RAM memory locations 40H to 41H using
(a) direct addressing mode,
(b) register indirect addressing mode without a loop,
(c) with a loop

d) Assume that RAM locations 40 – 44H have the following values.
Write a program to find the sum of the values. At the end of the program, register A should contain the low byte and R7 the high byte.
40 = (7D)
41 = (EB)
42 = (C5)
43 = (5B)
44 = (30)

3. **Answer the following(Any Three)** 12

a) What is the difference between the RET and RETI instructions? Explain why we can not use RET instead of RETI as the last instruction of an ISR.

b) Assume that the INT1 pin is connected to a switch that is normally high. Whenever it goes low, it should turn on an LED. The LED is connected to P1.3 and is normally off. When it is turned on it should stay on for a fraction of a second. As long as the switch is pressed low, LED should stay on.

c) Write a program for the 8051 to transfer "YES" serially at 9600 baud, 8-bit data, 1 stop bit, do this continuously

d) Write an ALP to rotate a motor 90° clockwise. Step angle of motor is 2°.

4 **Answer the following (Any one)** 8

a) Sketch the interface of a 16ch x 1line LCD to the 8051 microcontroller. Write an 8051 assembly program segment to display any Logo

b) Sketch the interface of an ADC 808 to the 8051 microcontroller. Write an 8051 assembly program segment to read an analog signal through the ADC

5 **Answer the following** 8 16

a) Describe the TCON, TMOD, SFR?

b) Discuss how serial interfacing is accomplished in PIC

c) State the applications of PIC microcontroller

d) Describe the port structure of Microcontroller?

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1.	a)	"Microcontrollers are advanced microprocessors." Justify the statement with valid points.	6
	b)	Explain the functions of the following pins of 8051μC; EA, PSEN, ALE/PROG	6
2.		Solve any **two (2)**	
	a)	Define the addressing modes and explain the addressing modes of 8051μC with examples.	6
	b)	Write a well commented program to add two BCD data bytes stored at memory locations 3000h and 3001h. Assume the sum to be greater than 8-bit .	6

Contd..

c) Write a program to arrange five elements of an array in ascending order. **6**

3. Solve any **two (2)**

a) Write a program to generate a continuous square wave on pin P1.5 continuously using *timer 0 in* mode 1, for a time delay generated by count value 7634h in the timer register. Find the frequency of square wave if XTAL is 11.0592MHz. **6**

b) Discuss the bit patterns of the SFRs associated with timer/counter of 8051µC. **6**

c) Write an ALP to send "HELLO" on serial port of 8051µC. **6**

4. a) Interface a 16-bit LCD with 8051µC and write a program to display "HELLO". **6**

b) Interface 8051µC with an *8k x 8 program ROM.* **6**

5. a) Write a note on ARM. **6**

b) Enlist the salient features of PIC **6**