



**COLLEGE OF ENGINEERING, SCIENCE AND TECHNOLOGY
SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING**

CERTIFICATE IV IN BIOMEDICAL TECHNOLOGY

EEE462 MICROCONTROLLER APPLICATIONS

FINAL EXAMINATION (TRIMESTER 3, 2016)

DATE/TIME/ROOM – Refer to Timetable

INSTRUCTIONS TO CANDIDATES

1. You are allowed 10 minutes extra time during which you are not to write.
2. Begin each answer on a fresh new page and use both sides of the sheets.
3. Write your identification number on the top of each attached sheet.
4. Insert all written foolscaps, graph paper, drawing paper, etc in their correct sequence and secure with string provided.
5. For all sheets of paper in which has been done, cross it through and you must attach to your answer script.
6. Write clearly the number(s) of the question(s) attempted on the top of each sheet.
7. Use the Answer Sheet in this Question Paper to answer Section A and attach to your Answer Booklet
8. Section A is compulsory.
9. Section B has 2 Questions.
10. Section C has 20 Multiple choice questions.

Total no of pages – 6 (including cover page)

SECTION A

Q 1 Attempt any two Questions **10 Marks**

- a) Explain the basic difference between Microprocessor and microcontroller.
- b) Write a 8051 program to add two 16 bit numbers?
- c) Explain What are interrupts and the the process that takes place when an interrupt occurs?

Q 2 Write a 8051 program to count the number of 1's & 0's in a number **10 Marks**

Q 3 Describe the Stack operation in 8051. **10 Marks**

Q 4 Write the 8051 program for Binary to BCD conversion. **10 Marks**

Q 5 What is the basic of Serial Communication? Explain Asynchronous serial communication and data framing. **10 Marks**

SECTION B

Q 1 Attempt any five **15Marks**

- a) What is the result of the following code and where it is stored?
MOV A, #15H
MOV R2, #13H

ADD A, R2
- b) In the ADD instruction, when is AC flag set?
- c) Which bit of IE belongs to the Timer interrupt? Show how both are enabled?
- d) What is the role of SBUF register during serial communication?
- e) What is the major difference between 8051 and 8052 microcontroller?
- f) Describe the internal Ram of 8051?

Q 2 With the aid of diagram, Explain the interfacing of seven segment display using a 8051.

(15 Marks)

SECTION C Multiple choice questions

(Choose only ONE correct answer from the choices given, Use the Answer Sheet attached at the back of this Question Paper and attach to your Answer Booklet.)

(20 Marks)

1. The following program will receive data from port 1, determine whether bit 2 is high, and then send the number FFH to port 3:
READ: MOV A,P1
ANL A,#2H
CJNE A,#02H,READ
MOV P3,#FFH
A True B False
2. When the 8051 is reset and the \overline{RD} line is HIGH, the program counter points to the first program instruction in the:
A. internal code memory
B. external code memory
C. internal data memory
D. external data memory
3. The 8051 has _____ parallel I/O ports.
A. 2
B. 3
C. 4
D. 5
4. The total external data memory that can be interfaced to the 8051 is:
A. 32K
B. 64K
C. 128K
D. 256K
5. Which of the following instructions will load the value 35H into the high byte of timer 0?
A. MOV TH0, #35H
B. MOV TH0, 35H
C. MOV T0, #35H
D. MOV T0, 35H
6. The 8-bit address bus allows access to an address range of:
A. 0000 to FFFFH
B. 000 to FFFH
C. 00 to FFH

- D. 0 to FH**
7. This program code will be executed once:
STAT: MOV A, #01H
JNZ STAT
A. True
B. False
8. To interface external EPROM memory for applications, it is necessary to demultiplex the address/data lines of the 8051.
A. True
B. False
9. The special function registers can be referred to by their hex addresses or by their register names.
A. True
B. False
10. The contents of the accumulator after this operation
MOV A,#2BH
ORL A,00H
will be:
A. 1B H
B. 2B H
C. 3B H
D. 4B H
11. The following program will cause the 8051 to be stuck in a loop:
LOOP:MOV A, #00H
JNZ LOOP
A. True
B. False
12. Which of the following commands will copy the contents of location 4H to the accumulator?
A. MOV A, 04H
B. MOV A, L4
C. MOV L4, A
D. MOV 04H, A
13. A HIGH on which pin resets the 8051 microcontroller?
A. RESET
B. RST
C. PSEN
D. RSET
14. An alternate function of port pin P3.0 (RXD) in the 8051 is:

- A. serial port input
 - B. serial port output
 - C. memory write strobe
 - D. memory read strobe
15. The I/O port of 8051 that does not have a dual-purpose role is:
- A. port 0
 - B. port 1
 - C. port 2
 - D. port 3
16. How are the bits of the register PSW affected if we select Bank2 of 8051?
- A) PSW.5=0 and PSW.4=1
 - B) PSW.2=0 and PSW.3=1
 - C) PSW.3=1 and PSW.4=1
 - D) PSW.3=0 and PSW.4=1
17. How is the status of the carry, auxiliary carry and parity flag affected if write instruction
MOV A,#9C
ADD A,#64H
- A) CY=0,AC=0,P=0
 - B) CY=1,AC=1,P=0
 - C) CY=0,AC=1,P=0
 - D) CY=1,AC=1,P=1
18. AT89C2051 has RAM of:
- A) 128 bytes
 - B) 256 bytes
 - C) 64 bytes
 - D) 512 bytes
19. The following command will rotate the 8 bits of the accumulator one position to the left:
RL A
- A. True
 - B. False
20. When the 8051 is reset and the EA line is LOW, the program counter points to the first program instruction in the:
- A. internal code memory
 - B. external code memory
 - C. internal data memory
 - D. external data memory

[THE END]



ANSWER SHEET (TO BE ATTACHED TO YOUR ANSWER BOOKLET)

SECTION C (MULTIPLE CHOICE), CIRCLE CORRECT ANSWER

Q1	A	B		
Q2	A	B	C	D
Q3	A	B	C	D
Q4	A	B	C	D
Q5	A	B	C	D
Q6	A	B	C	D
Q7	A	B		
Q8	A	B		
Q9	A	B		
Q10	A	B	C	D
Q11	A	B		
Q12	A	B	C	D
Q13	A	B	C	D
Q14	A	B	C	D
Q15	A	B	C	D
Q16	A	B	C	D
Q17	A	B	C	D
Q18	A	B	C	D
Q19	A	B		
Q20	A	B	C	D