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C16–EC–**502**

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BOARD DIPLOMA EXAMINATION, (C–16)

OCT/NOV—2018

DECE—FIFTH SEMESTER EXAMINATION

MICROCONTROLLERS

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. List the any six features of microcontrollers.

2. Distinguish between machine cycle and T-state.

3. List any three logical instructions of 8051.

4. Mention the interrupts and their priorities of 8051.

5. Define a subroutine and explain its use.

6. What is debugging?

7. Explain key press and detection mechanism.

8. Draw the interfacing diagram of LCD module with 8051.

9. Write the instructions to set up time delay using a timer.

10. Mention the RS 232 pins of DB-9 connector.

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) The answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Draw the functional block diagram of 8051 microcontroller and explain about each block.

12. Explain about any five data transfer instructions with examples.

13. *(a)* Mention the differences between assembly level and machine level programming.

(b) Explain ROTATE instructions with sketches.

14. Write the important steps in writing and trouble shooting a program.

15. Write an assembly language program to find the sum of 10 bytes in internal data memory locations beginning at 40H. Store the 16-bit sum in locations 50H and 51H (MSB).

16. Write a program to access key code from matrix keyboard.

17. *(a)* Explain the interfacing of solid state relay with 8051 to drive a mains operated motor.

(b) State the need of optocoupler for interfacing with 8051.

18. *(a)* Explain PWM for controlling the speed of small DC motor.

(b) Draw a driver circuit required to run stepper motor.

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6630
BOARD DIPLOMA EXAMINATION
MARCH/APRIL - 2019
DIPLOMA IN ELECTRONICS AND COMMUNICATION ENGINEERING
MICROCONTROLLERS
FIFTH SEMESTER EXAMINATION

Time: 3 Hours **Total Marks: 80**

PART - A (3m x 10 = 30m)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. List the modes and their functions of Timers in 8051
2. Differentiate Microprocessor and Microcontroller?
3. Classify instructions of 8051 microcontroller
4. Explain RL A and RRC A instructions of 8051 microcontroller
5. Write an ALP to transfer the data byte present in external memory with address 4500H into external memory with address 4501H
6. What is the content of Accumulator and the state of Carry flag after execution of the following instructions?
   MOV R3, #55H
   MOV A, #AAH
   ADD A, R3
7. Draw a diagram interfacing 16 X 2 LCD module to 8051 microcontroller
8. Draw a diagram interfacing 8 LEDs to Port3 of 8051 microcontroller
9. Draw the pin configuration of RS 232 DB9 connector
10. What is the use of stepper motor?

PART - B (10m x 5 = 50m)

Note 1:Answer any five questions and each carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. (a) Explain the structure of internal RAM of 8051 (6M)
    (b) Explain the functions of PC and DPTR of 8051 (4M)
12. Explain the operation carried out on execution of the following 8051 instructions. (10M)
    (i) MOV 33H, R0 (ii) MOV @R1, A (iii) MOVX A, @R1
    (iv) MOVX A, @DPTR (v) MOVX @DPTR, A

13. Explain different types of Rotate instructions of 8051

14. What is Debugging? Explain briefly different types of debugging techniques.

15. Ten 8 bit numbers are present in the external RAM locations from address 4500H. Write an ALP with comments to transfer these numbers into i-RAM locations from address 40H

16. Draw interfacing diagram to connect 8 LEDs to Port 3 of 8051 microcontroller and write an ALP with comments to make all LEDs to blink continuously with a delay of 1 second

17. (a) Explain the need for pulse width modulation in motor speed control application (5M)

    (b) Draw an interfacing circuit to interface a stepper motor to 8051 with a driver (5M)

18. Write an ALP to transmit the message "POLY" serially with 9600 Baud rate

- xxx -

6630
BOARD DIPLOMA EXAMINATION
JUNE - 2019
DIPLOMA IN ELECTRONICS AND COMMUNICATION ENGINEERING
MICROCONTROLLERS
FIFTH SEMESTER EXAMINATION

Time: 3 Hours **Total Marks: 80**

PART - A (3m x 10 = 30m)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Draw the format of PCON register in 8051 microcontroller
2. What is the function of Stack Pointer and Program Counter?
3. Write the instruction format of 8051
4. Explain the instructions: (a) ANL A, Direct (b) XRL A, @ R1
5. Write an ALP to subtract the 8 bit number present in external RAM with address 3600H from the number present in R3 and store the result in i-RAM with address 30H
6. Write an ALP to copy the data byte from external RAM with address 3300H into i-RAM locations with address from 30H to 34H
7. Draw a diagram interfacing 16 X 2 LCD module to 8051 microcontroller
8. What is Key debouncing? List different debouncing techniques
9. While 8051 timer 1 is operated in mode 2, Calculate the count(Hexadecimal) to be loaded into TH1 register to get a time delay of 100 μ sec. Take crystal frequency as 12 MHz
10. What is the need for MAX 232?

PART - B (10m x 5 = 50m)

Note 1:Answer any five questions and each carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. Draw the figure showing the internal architecture of 8051 microcontroller and explain the function of each block
12. Explain the operation carried out on execution of the following 8051 instructions. (10M)

    (i) MOV 33H, R0 (ii) MOV @R1, A (iii) MOVX A, @R1

    (iv) MOVX A, @DPTR (v) MOVX @DPTR, A

13. Classify different groups of instructions of 8051 microcontroller and explain each group with two examples

14. Ten 8 bit numbers are present in the external RAM locations from address 4500H. Write an ALP with comments to transfer these numbers into i-RAM locations from address 40H

15. Two 8 bit numbers are present in the i-RAM locations with address 30H & 31H. Write an ALP with comments to add these numbers and to store the sum and carry in the i-RAM locations with address 32H & 33H respectively

16. Draw interfacing diagram to interface a 16 X 2 LCD module to 8051 microcontroller and write an ALP to display "POLY" in the middle of 1st line

17. Write an ALP to generate a square wave of 10 KHz frequency on P3.2 of 8051 microcontroller using timer 1 in mode 1

18. (a) Explain briefly the working of Stepper motor. (5M)
(b) Draw and explain an interfacing circuit to interface 8051 to a stepper motor with a driver (5M)

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BOARD DIPLOMA EXAMINATIONS

OCT/NOV-2019

DECE–FIFTH SEMESTER

MICROCONTROLLERS

Time:3 hours Max. Marks: 80

PART – A 3 X 10 = 30

Instructions: *1. Answer **all** questions.*
*2. Each question carries **Three** Marks.*
3. Answer should be brief and straight to the point and should not exceed five simple sentences.

1. Compare Microprocessors and Microcontrollers.
2. State the function of PSW.
3. Give the instruction format of 8051.
4. Define fetch cycle, execution cycle and instruction cycle.
5. Explain the term " Debugging ".
6. Draw any three symbols used in flow charts.
7. Draw the pin diagram of 16X2 LCD module.
8. List any three instruction command codes for programming an LCD module.
9. State the need of opto - coupler for interfacing.
10. List RS232 pins of DB9 Connector.

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PART – B 5 X 10 = 50

Instructions: *1. Answer any **Five** questions*
*2. Each question carries **TEN** Marks.*
3. Answer should be comprehensive and Criteria forValuation is the content but not the length of the answer.

11. Draw and explain the functional block diagram of 8051 microcontroller.

12. Explain the following instructions with examples.

    1)DA A 2) ORL A, Rn 3) XCHD A,@Ri

    4)LCALL ADDR16 5)SETB bit

13. Explain the addressing modes of 8051 with examples.

14. a) Define " Subroutine " and explain its use. 4M

    b) Explain the sequence of program when subroutine is called & executed. 6M

15. Write an assembly language program to compute the sum of two10 byte (multi byte) numbers. Assume that the first number is stored in internal data memory locations 30H to 39H (MS Byte) and the second number in locations 40H to 49H (MS Byte). Store the 10 byte sum in locations 40H to 49H (MS Byte).

16. Draw and Explain the Interfacing of a 4x4 Matrix Keyboard with 8051.

17. Explain the Pulse width modulation for controlling the speed of small DC Motor using 8051 Microcontroller.

18. Draw and Explain the interfacing of a driver circuit required to run a Stepper Motor using 8051 Microcontroller.

C16–EC–502

6630

BOARD DIPLOMA EXAMINATION, (C–16)

NOVEMBER—2020

DECE—FIFTH SEMESTER EXAMINATION

MICROCONTROLLERS

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions **:** (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. List the features of microcontrollers.

2. State the basic function of :

(a) Program counter

(b) DPTR

(c) Stack pointer

3. Write the instruction format of 8051.

4. Explain the following instructions :

(a) MOV A, R3

(b) CLR A

(c) ADD A, B

5. List the various symbols used in drawing flow charts.

6. State the status of CY, AC and P flags while adding two bytes 32H and 1FH.

7. Mention the reasons for the popularity of LCDs.

8. Draw the interfacing diagram to interface pushbutton switch to 8051.

9. List RS232 pins of DB-9 pin connector.

10. Write an ALP to generate a delay of 1ms using Timer 1 in mode 1 with XTAL frequency of 11.0592 MHz.

PART—B

10×5=50

Instructions **:** (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

11. Draw the pin out diagram of 8051 and explain the function of each pin.

12. State and explain the various addressing modes of 8051.

13. Explain the Data Transfer Instructions with examples.

14. Explain the principle of single step and break point debugging techniques.

15. Write a program to copy the value 36H into memory locations 50H to 55H using register indirect addressing mode without loop and with a loop.

16. *(a)* Draw interfacing diagram to interface common cathode seven segment display.

(b) Write a program to display digit '9' in a common cathode seven segment display.

17. Write a program to generate a square wave with an ON time of 2 ms and an OFF time of 5 ms on pin P3.2. The crystal frequency of 8051 is 11.0592 MHz and timer in timer 0 and mode 1 operation.

18. *(a)* Draw an interfacing circuit to interface a stepper motor --- (5M).

(b) Write a program to run a stepper motor continously --- (5M).

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BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2021

DECE - FIFTH SEMESTER EXAMINATION

MICROCONTROLLERS

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. List any six features of microcontrollers.

2. List the interrupts of 8051 microcontrollers along with their vector address.

3. List the different addressing modes of 8051.

4. Define opcode and operand with examples.

5. What is the value of A register after executing the following program?

```
MOV A, #78H
ANL A, #0FH
```

6. Explain about RET and RETI instructions.

7. What is key bouncing problem? List different de-bouncing techniques.

8. Draw an interfacing diagram of a 4×4 matrix key board to 8051 microcontroller.

9. What is the need for MAX 232?

10. Explain the need of opto-couplers in interfacing.

PART—B

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. Draw the functional block diagram of 8051 microcontroller and explain the function of each block. 10

12. Explain the following instructions : 10

(a) MUL AB

(b) DIV AB

(c) PUSH direct

(d) POP direct

(e) DA A

13. *(a)* Explain differences between MOV and MOVX instructions. 5

(b) Describe LJMP, AJMP, SJMP instructions. 5

14. Write a program to add two 16-bit numbers 1234H and 6789H. Store the sum in RAM location 8000H and 8001H and carry in 8002H. 10

15. Define subroutine and explain the sequence of program when subroutine is called and executed. 10

16. *(a)* Explain the function of each PIN in 16X2 LCD. 5

(b) Draw the interfacing diagram of 16X2 LCD module with 8051. 5

17. Write a program to generate a square wave of 1 kHz from the pin P3.1 of 8051, using Timer 1, Mode 1. Assume clock frequency of 12MHz. 10

18. *(a)* Explain briefly the working of stepper motor. 5

(b) Draw and explain a driver circuit required to run a stepper motor. 5

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