2558

JANUARY 2026

509/1(N)

MICROCONTROLLER & ITS APPLICATIONS

Time Allowed: 2.5 Hours *Full Marks: 60*

Answer to Question No. 1 of Group A must be written in the main answer script. In Question No. 1, out of 2 marks for each MCQ, 1 marks is allotted for right answer and 1 marks is allotted for correct explanation of the answer.

Answer any Five (05) Questions from Group-B.

GROUP-A

1. Choose the correct answer from the given alternatives and explain your answer (any ten): 2x10=20

i)What is the addressing mode of the instruction MOV R0, #30H?

(a)immediate (b)register direct (c) register indirect (d)indexed

ii) Which register bank is selected by default after system reset?

(a)Bank 0(b)Bank 1(c)Bank 2(d)Bank 3

iii)What should be the bit values of RS1 and RS0 bits of PSW SFR to select register bank #2?

(a) 1and1 (b)1 and 0 (c) 0 and 0 (d) none of these.

iv)What is the special function of register B?

(a) substitute accumulator (b) to perform 16bit operations along with accumulator

(c) serve as a pointer register (d)to perform multiplication and division

v)What would be the content of DPH after execution of MOV DPTR, #1234H instruction?

(a) 12H (b) 34H (c) 1234H (d) 23H

vi)Which of the following instructions would clear the only CYflag?

(a) CLR PSW (b) CLR ALL (c) MOV PSW, #00H (d) CLR C

vii)The OR instruction is generally used to

(a) set a few bits (b) clear a few bits (c) complement a fewbits (d) none of the above.

viii)Which location of 128 bytes on chip additional RAM are generally reserved for special functions?

(a)70H to 0FFH (b) 80H to 0FFH (c) 60H to 0FFH (d) 90H to 0FFH

ix)After execution of DIV AB instruction the quotient is available in

(a) the accumulator (b) B register (c) PSW (d) DPTR.

x)To which SFR does the RUN/STOP control bit TR0 for Timer 0 belong?

(a) TMOD (b) T2CON (c) TCON (d) IE

xi)How many interrupts does 8051 have?

(a) 2 (b) 3 (c) 4 (d) 5

xii)When the 8051 is reset and the $\overline{EA}$ 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

xiii)Which of the following software is used for programming a microcontroller?

(a) Microsoft word (b) Microsoft excel (c) Keil (d) AutoCad

xiv)Which register usually store the output generated by ALU in several arithmetic operations?

(a) accumulator (b) special function register (c) timer register (d) stack pointer

xv)The 8051 has _____ 16 bit counter/timers.

(a) 1 (b) 2 (c) 3 (d) 4

GROUP-B

Answer any Five (05) questions.

2. a) Write four prominent differences between microprocessor and microcontroller.
   b) Discuss the PSW register of 8051. 4+4

3. a) Illustrate neat block diagram of 8085 microprocessor and explain its internal architecture.
   b) Explain Program counter & DPTR. 4+4

4. Explain the following instructions:
   i) DJNZ R0, 1000H ii) RRC A iii) DIV AB iv) DAA 4x2

5. a) Explain internal memory organisation of 8051 microcontroller.
   b) Discuss how register bank can be selected from PSW SFR. 6+2

6. a) Explain the various addressing modes of 8051 microcontroller.
   b) Define Opcode and Operand. 6+2

7. a) Write an 8051 program to generate square wave of 1KHz from P1.2 of 8051, using Timer 0, Mode 1. Assume clock frequency of 12 MHz
   b) Define Timer Mode 0. 6+2

8. a) List the interrupts of 8051 microcontroller along with their vector address& Priority.
   b) Write down the steps to enable an interrupt of 8051. 4+4

9. a) With the help of circuit diagram and 8051 assembly code briefly discuss how voltage measurement can be done with 8051 microcontroller and external ADC IC.
   b) Give an example of assembler directive supported by 8051 assembler software. 6+2

10. a) Write an 8051program to add two 16-bit numbers stored in 20H location onwards and 30H location onwards. Store the sum in RAM location 40H onwards.
   b) What is the purpose of ALE signal. 6+2