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(2063)

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B.Tech 4th Semester Examination

Digital Electronics and Microprocessor Architecture

EC-4041

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : (i) Attempt only five questions selecting one question from each section A, B, C and D.

(ii) Section E is compulsory.

(iii) Use of non-programmable calculator is allowed.

SECTION - A

1. (a) Perform the following conversion:

(i) $(BAD)_{16}$ into Decimal Number.

(ii) $(CAD)_{16}$ into octal Number. **(10)**

(b) Write short note on:

(i) BCD code (ii) Excess-3 code **(10)**

2. (a) Perform the following arithmetic operations.

(i) $(1010)_2 \times (101)_2$ (ii) $(564)_8 - (475)_8$ **(10)**

(b) (i) Find 2's compliment of $(10010.11)_2$

(ii) Determine 16's compliment of hex number 5479. **(10)**

SECTION - B

3. (a) Explain the Demorgan's theorem for boolean algebra and simplify the boolean function (A+B+C) $(A+\overline{B}+C)(A+\overline{C})$. **(10)**

   (b) Reduce the following function using k-map method.

   f(A, B, C, D) = πm(4, 5, 6, 7, 8, 12, 13)+ d(1, 15) **(10)**

4. (a) Write truth table of full adder and implement sum and carry expression using NAND gate only. **(10)**

   (b) Explain the working of dual-slope integrating type analog to digital converter. **(10)**

SECTION - C

5. (a) Differenciate microprocessor from microcontroller along with block diagram. **(10)**

   (b) Explain the following term:

   (i Machine language (ii) Assembly language (iii) High level language (iv) Interpreter **(10)**

6. (a) Write the assembling language code to find 1's—compliment of a number. **(10)**

   (b) Explain the development of microprocessor. **(10)**

SECTION - D

7. (a) Explain the architecture of 8085 microprocessor with functional block diagram. **(10)**

(b) Draw the internal building blocks of 8080 microprocessor and compare it with 8085 microprocessor. **(10)**

8. (a) Explain different control signal used by 8085. **(10)**

(b) What do you understand by dynamic debugging. Explain various methods of debugging in 8080. **(10)**

SECTION - E

9. Each subpart carry 2 marks:

(i) Express y = A + BC into canonical SOP form.

(ii) Signify the importance of gray code.

(iii) Implement Ex-OR gate with minimum number of NAND gate.

(iv) Implement the NAND gate using 2×1 MUX.

(v) Differentiate synchronous and asynchronous counter.

(vi) Convert $(19.3725)_{10}$ into equivalent binary number.

(vii) A decade counter is applied with 10MHz clock frequency. What will be the frequency of wave form at the output?

(viii) Write the significance of BCD code.

(ix) What do you understand by resolution in D/A converter?

(x) Which logic gates are called universal gate? “Universal gates follow commulative law but not follow associative law”. Explain the statement. **(2×10=20)**