[Total No. of Questions - 9] [Total No. of Printed Pages - 3] (2125)

15106

B. Tech 4th Semester Examination

Digital Electronics and Microprocessor Architecture (OS)

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) Derive expressions to convert Excess-3 code to Gray codes. (10)

   (b) Perform the subtraction using 2's complement arithmetic. (-25) - (-48). (10)

2. (a) Convert the octal number $(257.46)_8$ into binary, hexadecimal and decimal numbers. (10)

   (b) Write short notes on error detecting codes. (10)

SECTION - B

3. (a) Reduce the following function using k-map. F(A,B,C,D) = Σ(0,2,3,8,11,10,15) + d(5,6). (10)

   (b) State and prove DeMorgan. (10)

4. (a) Write short notes on D/A Converters. (10)

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   (b) Discuss a combinational 4-bit full adder. Draw the necessary circuit (10)

SECTION - C

5. (a) Discuss in detail the evolution of microprocessors. (10)

   (b) Differentiate between machine language and assembly language with examples. (10)

6. (a) Write an assembly program to find if the number is divisible by 3. (10)

   (b) Discuss the hardware/software requirements of a microprocessor. (10)

SECTION - D

7. (a) Draw and explain the architecture of 8085 microprocessor with the programmers model. (10)

   (b) Compare and contrast 8085 with any other microprocessor of your choice. Justify your answers. (10)

8. (a) Draw the necessary diagrams and explain one I/O interface of 8085. (10)

   (b) Draw the instructions timing diagram for a memory mapped I/O. (10)

SECTION - E

9. (a) Rewrite the expression F=A+B+CD in canonical POS form.

   (b) Write the BCD equivalents of gray code.

   (c) Differentiate between RAM and ROM.

(d) Draw the D-Latch and explain its working.

(e) Draw a 4-bit asynchronous counter.

(f) Convert the two's complement number $(1101)_2$ into its decimal equivalent

(g) Describe the advantages of memory mapped I/O.

(h) Give the classification of instructions.

(i) Explain dynamic debugging.

(j) Write the truth table of a 4:2 Encoder and give its equation. (2×10=20)