Paper 3 : 2011 ANNUAL
COMPUTER SYSTEM ARCHITECTURE

Note : Attempt one question from each Unit. All questions carry equal marks.

UNIT - 1

1. (a) Convert the following :

   (i) $(1101.1001)_2 = (\ )_{10}$

   (ii) $(37.65)_{10} = (\ )_2$

   (iii) $(10001111101001)_2 = (\ )_8$

   (iv) $(43.52)_{10} = (\ )_{16}$

   (b) Subtract $(101101)_2$ from (110110) using 2's complements.

OR

Explain the following using proper illustrations :
(i) ASCII codes
(ii) Grey codes
(iii) BCD codes
(iv) Error correcting codes

UNIT - 2

2. (a) Explain NAND and XOR gates operations using truth table.

   (b) Simplify function : $X = (B + C)(\overline{B} + D)(C + D)$

OR

(a) Design full adder.
(b) Write a short note on shift register.

UNIT - 3

3. Describe microprocessor architecture with proper illustrations. Explain system buses and program counter in short.

OR

Explain the following :
(i) CPU organization
(ii) Microprocessor control signals

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UNIT - 4

4. Explain input-output organization in a system. Describe simple properties of I/O devices and their controllers.

OR

Explain various modes of data transfer. Discuss handshaking and asynchronous serial data transfer using examples.

UNIT - 5

5. How auxiliary memory is different from other types of memories ? discuss advantages and disadvantages of semiconductor memories.

OR

(a) What do you mean by Address Mapping ? Explain.
(b) Explain memory hierarchy. Differentiate between address and memory space.