Digital Computer Organisation

Year 2010-2013

Answer Any Five Question

1. (a) Choose the correct options:

I. The [art of machine level instruction, which tells the central processor what was to be done is _____
   a) Operation code
   b) Address
   c) Operand
   d) None of the above

II. Half adder consist of _____ & _____ Gates
   a) EX-OR & AND
   b) EX-OR & OR
   c) EX-OR & NOT
   d) None of these

III. Subtract $(1010)_2$ from $(1101)_2$ using 1st complement
   a) $(1100)_2$
   b) $(0011)_2$
   c) $(1001)_2$
   d) $(0101)_2$

IV. Full adder is constructed by using _____
   a) Two Half Adder & one OR gate
   b) Two OR fate & one HA
   c) One HA & two OR gate
   d) One OR gate & one HA

V. The digital system usually operated on _____ system
   a) Binary
   b) Decimal
   c) Octal
   d) Hexadecimal

VI. A logic gate is an electronic circuit which _____
   a) Makes logic decisions
   b) Allows electron flow only in one direction
   c) Works on binary a;gebra
   d) Alternates between 0 & 1 values

VII. The only7 function of a NOT gate is to_____
   a) Stop a signal
   b) Re-complement a signal
   c) Invert an input signal
   d) Act as a universal set

VIII. Karnaugh map (K-map) technique provides a systematic method for simplifying_____
  a) Multiplexers
  b) Logic gates
  c) Boolen expressions
  d) None of these

IX. A register is a group of_____
  a) OR gates
  b) OR &AND gates
  c) Flip flops
  d) None of these

X. The NOT symbol at the output of an OR gate:
  a) Converts it into AND gate
  b) Converts it into NAND gate
  c) Converts it into XOR gate
  d) Converts it into NOR gate

B. Fill in the blanks:

I. _____is the name of the logic circuit which can add twp binary digits.

II. The logical expression (Y=A.B) is of _____gate

III. _____flip flop Considered the universal flip-flop.

IV. A hexadecimal number system code uses ____ basic symbols.

2. Briefly explain the reason that why we have to simplify the Boolean functions ? Write few advantages also.

3. What are multiplexers? Differentiate between multiplexers and demultiplexers.

4. Simplify following Boolean function using k-map:
$$F(A,B,C,D)=\sum (0,1,2,3,5.8,9,10)$$

5. What do you mean by 'Flip-Flop'? Explain various Flip-flops along with their logic diagrams and truth tables.

6. Discuss the term 'Memory Hierarchy'. Write a note on 'Associative Memory'.

7. What do you mean by 'logic family'? Explain its characteristics.

8. List down various advantages of using a CPU register for temporary data storage over using a memory location?

9. Describe briefly the working of DMA Controller with suitable diagram.

10. Write short notes of any two from following:
  I. Cache Memory
  II. Data Transfer modes
  III. Encoder-Decoder
  IV. Virtual Memory