HP-003-3032003

B. C. A. (Sem. II) (CBCS) (W.E.F.-2022) Examination

April – 2023

Computer Organization & Architecture : CS-09

(New Course)

Faculty Code : 003
Subject Code : 3032003

Time : $2\frac{1}{2}$ Hours / Total Marks : **70**

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1 (a) Attempt the following :   **4**

    (1) Which is the inverter gate of LAND gate ?

    (2) Is flip-flop is a sequentially designed circuit ?

    (3) POS stands for.

    (4) Write two commutative postulates.

  (b) Attempt any one :   **2**

    (1) What is Boolean algebra ?

    (2) What is combinational circuit ?

  (c) Attempt any one :   **3**

    (1) Explain and prove De-Morgan's theorems.

    (2) Simplify following Boolean function using K-map.

       $F(w,x,y,z) = \Sigma(0,1,2,3,7,8,10) + d\,(5,6,11,15)$

  (d) Attempt any one :   **5**

    (1) Write a detailed note on types of logic gates.

    (2) Draw circuit and explain D and JK flip-flop.

2 (a) Attempt the following :   **4**

  (1) What is Bi-directional shift register ?

  (2) De-Multiplexer is also known as _____.

  (3) If we construct 8 bits Mux, then how many selection lines are required?

  (4) VLSI stands for _____.

  (b) Attempt any one :   **2**

  (1) Explain Buffer register.

  (2) Explain shift register.

  (c) Attempt any one: **3**

  (1) Write a note on 3x8 decoder.

  (2) Write a note on encoder.

  (d) Attempt any one :   **5**

  (1) Explain multiplexer in detail.

  (2) Draw and explain register with parallel load.

3 (a) Attempt the following :   **4**

  (1) What is parity bit ?

  (2) Base of an octal number is _____

  (3) If number is negative, then sign bit will be _____.

  (4) Write 2's complement of 010011000.

  (b) Attempt any one :   **2**

  (1) Perform binary multiplication of 1011 × 101.

  (2) Perform binary division of 110111 ÷ 101.

  (c) Attempt any one :   **3**

  (1) Multiply 1011.01 by 101.01 in binary.

  (2) Explain fixed point representation with example.

  (d) Attempt any one :   **5**

  (1) Explain floating point representation with example.

  (2) Explain error detection code with example.

4   (a)   Attempt following :   **4**
              (1)   CPU stands for _____.
              (2)   (A+B) * C write prefix notation of given expression.
              (3)   Control word is of _____ number of bits.
              (4)   Register overflow is an example of _____ type of interrupt.

       (b)   Attempt any one :   **2**
              (1)   Explain major components of CPU.
              (2)   Explain Register Stack.

       (c)   Attempt any one :   **3**
              (1)   Explain interrupt and its various types.
              (2)   Draw and explain block diagram of A.L.U.

       (d)   Attempt any one :   **5**
              (1)   Write a note on general register organization.
              (2)   Write a detailed note on RPN with stack organization.

5   (a)   Attempt following :   **4**
              (1)   IOP stands for _____.
              (2)   DMA stands for _____.
              (3)   List out memory buses.
              (4)   Full form of BG signal in DMA.

       (b)   Attempt any one :   **2**
              (1)   What is high impedance model ?
              (2)   Write concept of input output interface.

       (c)   Attempt any one :   **3**
              (1)   Explain memory buses.
              (2)   Explain how DMA works in brief.

       (d)   Attempt any one :   **5**
              (1)   Write a detailed note on DMA controller.
              (2)   Write a detailed note on IOP.

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