NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja
FACULTY OF SCIENCES
COMPUTER SCIENCE DEPARTMENT
2021 EXAMINATIONS

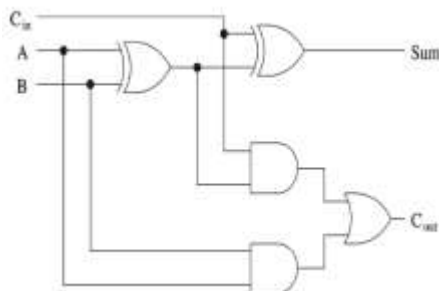CIT 344 – Introduction To Computer Design   Credit: 3 units
TIME ALLOWED: 2½ Hours
INSTRUCTION: Answer Question 1 and any other FOUR (4) Questions

QUESTION ONE   (22 marks)

(a)   i. Convert the fraction decimal 600.88 to binary   *(2 mark)*
        ii. Convert fraction binary number 11101.11 to decimal equivalent   *(2 mark)*
        iii. Carry out the binary multiplication of 1110011 and 1100   *(2 mark)*
        iv. Convert the binary number 1110011 to hexadecimal   *(1 mark)*
(b)   Distinguish between BCD and Gray Code   *(2 marks)*
(c)   Explain the steps required for the design of a Combinational Logic Circuit *(3 marks)*
(d)   Construct the truth table for the logic circuit given below: (3½ marks)

(e)   Simplify the expression $\overline{A}\,\overline{B}\,C + \overline{ABC} + \overline{AB}C + ABC$ (1½ *marks*)
(f)   What is the function of a multiplexer?   **(1 mark)**
(g)   What is a Priority Encoder?   **(2 marks)**
(h)   Construct the truth table for NOR based S-R Latch   **(2 marks)**

QUESTION TWO   (*12 marks*)

(a)   Construct the truth table for Truth Table of a Gated D Latch   *(3½ marks)*
(b)   List the three different types of edge-triggered flip-flops are generally used in digital logic circuits.
                                                                              (3 marks)

(c)   What are the features of 74HC74 flip=flop?   (2 marks)

(d)   Convert 675_8 to base two   *(2 ½ mark)*

(e)   What is the meaning of BCD?   *(1 mark)*

QUESTION THREE   (*12 marks*)

(a)   Draw the diagram for 11-Bit Serial Data converter   (3 marks)

(b)   What is a sequencer?   (2 marks)

(c)   Give the meaning of the acronym MIDI   (1 mark)

(d)   What are the characteristics of MIDI sequencer?   (4 marks)

(e)   What is a transducer?   (2 marks)

QUESTION FOUR   (*12 marks*)

(a)   Draw a diagram for Traffic Light Sequencer   (3 marks)

(b)   Draw a diagram for 64-Cell Memory Array   (4 marks)

(c)   Evaluate this expression **(P∧¬Q) ∨ ¬(P∨Q)** using Truth Table   (*5 marks*)

QUESTION FIVE   (*12 marks*)

(a)   Draw the Circuit Diagram of a Static Memory Cell based on a Flip-Flop   (*5 marks*)

(b)   What are the characteristics of Static RAM   (*3 marks*)

(c)   What is the drawback of DRAM?   (1½ mark)

(d)   Convert the hexadecimal AF56C to binary   (2½ marks)

QUESTION SIX   (*12 marks*)

(a)   What is the meaning of acronym MOSFET   (*2 marks*)

(b)   What is FLASH memory?   (3 marks)

(c)   Give the characteristics of any three types of memory in tabular form   (7 marks)