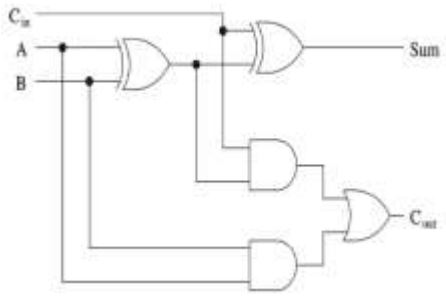
NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja
FACULTY OF SCIENCES
COMPUTER SCIENCE DEPARTMENT
2021 EXAMINATIONS45678

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 $\overline{A}\,\overline{B}\,C + \overline{A}B\overline{C} + \overline{A}\overline{B}C + ABC$ (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 $\mathbf{(P \wedge \neg Q) \vee \neg (P \vee Q)}$ 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)