NATIONAL OPEN UNIVERSITY OF NIGERIA

UNIVERSITY VILLAGE, 91 CADASTRAL ZONE, NNAMDI AZIKWE EXPRESSWAY, JABI, ABUJA
FACULTY OF COMPUTING

2024_2 EXAMINATION

COURSE CODE: CIT 344
COURSE TITLE: Introduction   to Computer Design
CREDIT: 3 Units
TIME: 2½ Hours

INSTRUCTION: Answer Question ONE (1) and any other THREE (3) Questions

1a)   State two (2) basic functions of registers as logic circuits.   **(2marks)**

1b)   State six (6) different forms of the subroutine return instructions.   **(6marks)**

1c)   List and explain the applications of decoders in computer systems. **(5marks)**

1d)   State the functions of near call instruction of Assembly language in programming. **(3marks)**

1e)   Why do we learn Assembly language?   **(6marks)**

1f)   Solve the following:

   i.   Convert 1100101.1101_2 to base ten number
   ii.   Find the hexadecimal difference of these numbers 95C4 and 37C5   **(3marks)**

2a) i) Explain the term "**bit**" in number system.

   ii) What does the subscript two in this number 101101011_2 indicates?   **(2marks)**

2b)   Write short notes on the following terms:

   i)   Latches
   ii)   Registers
   iii)   Flip-flop   **(6marks)**

2c)   What is a sequential logic circuit?   **(2marks)**

2d)   State the difference between Read Only Memory and Random Access Memory. **(5marks)**

3a)   Define the term "complement" in number system with two (2) examples. (*3marks*)

3b) Write a short note on these:
   i. Gray code
   ii. Excess-8 code
   iii. ASC11 code
   iv. Extended ASC11 code   (*6marks*)

3c.(i) What does the dash line that appear when beginning a debug programming in your computer indicates?   (*1mark*)

   (ii) What does the "**h**" command that is used to obtain the length of a program means?   (*1mark*)

3d) Complete the table to provide the meaning of set of command that lets user perform some useful operation in Assembly language.   (*4marks*)

Set of Command	Meaning of Operations
	Assembly symbolic instruction into machine code
D	
	Enter data into memory, beginning at a specific location
	Name a program
P	
Q	
G	
	Trace the contents of one instruction

(4a) How can one analyze a Combinational Logic Circuit?   (*3marks*)

(4b)   Given an expression of 1-bit full adder as (a*b) + (a*c)

   (i)   Construct the truth table for 1-bit full adder
   (ii)   Simplify the sum-of product for sum
   (iii)   Draw the logic circuit from its minimal expression   (*6marks*)

(4c) (i)   What determines the efficiency and effectiveness of the instruction executed by the microprocessor?   (*1mark*)

   (ii)   List out the 3 tools used in building Assembly language program. (*1½ marks*)

   (iii)   Convert 546 in base ten to base two.   (*1½ marks*)

(4d) Define CPU and its main functions.   (*2marks*)

(5a)   What are the functions of demultiplexer in logical system?   ***(4marks)***

(5b)   What is different between LOOPE and LOOPZ?   ***(4marks)***

(5c)   Illustrate by construction how Truth-table for Negative Edge Triggered S-R Flip Flops look like.
                    (2marks)

(5d)   What is ALU and list any two (2) of the different commercially available ALUs you know?
(5marks)

(6a)   Describe K-map and its uses.   ***(3marks)***

(6b)   Give a detailed explanation of any four (4) different shift operations that can be identified with 4-bit shift registers.   ***(12marks)***