



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI-ABUJA
FACULTY OF SCIENCES

DEPARTMENT OF COMPUTER SCIENCE

2022_2 EXAMINATION

COURSE CODE: CIT 309
COURSE TITLE: Computer Architecture I
CREDIT UNIT: 3
TIME ALLOWED: 2½HRS
INSTRUCTION: ANSWER QUESTION ONE (1) AND ANY OTHER FOUR

Question 1

- (a) Evaluate any three (3) methods of accessing units of data in the memory of a computer system (*9 marks*)
- (b) As a user of the computer system, what are the performance parameters that are used by the computer memory? (*4 marks*)
- (c) i. Draw a diagram that represent the basic instruction cycle in a computer system (*7 marks*)
 - ii. The PDP-11 processor includes an instruction, expressed physically as ADD C,D, that stores the sum of the contents of memory locations C into memory location D. Sequentially itemize a single instruction cycle of how this instruction is executed in the system's memory (*5 marks*)

Question 2

- (a) Give a concise description of the Arithmetic and Logic unit of a computer system (*6 marks*)
- (b) Define the following terms (*4½marks*)
 - (i) Overflow rule
 - (ii) Subtraction flow
 - (iii) Floating point numbers
- (c) Itemize and briefly explain three elements of instruction (*4½ marks*)

Question 3

3(a)

- (i) Outline the types of parallel processor system we have in computer science (*2½ marks*)
 - (ii) Briefly discuss any four (4) of your answers in (i) (*6 marks*)
- (b) (i) State the registers involved in fetching instruction from the system's memory (*2 marks*)
- (ii) Briefly explain any three (3) out of the four registers that causes an instruction to be fetched from the memory (*4½ marks*)

Question 4

- (i) State three (3) features that can facilitate DMA transfers from I/O processors in a system (*3 marks*)
- (ii) Briefly explain three (3) of the features you stated in (i) above (*6 marks*)
- (iii) State the order of operations of the control unit in one clock pulse (*6 marks*)

Question 5

- (a) Broadly speaking, there are three (3) principal approaches to multithreading – **Discuss** (*9 marks*)
- (i) Define scheduling (*1 mark*)
 - (ii) Mention two types of scheduling we have in computer science (*5 marks*)

Question 6

- (a) Briefly discuss the important issues in the design of instruction sets (*9 marks*)
- (b) Identify four key characteristics of a symmetric multiprocessor (SMP) system (*6 marks*)