



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**University Village, 91 Cadastral Zone, Nnamdi Azikwe Expressway, Jabi, Abuja**  
**FACULTY OF COMPUTING**  
**COMPUTER SCIENCE DEPARTMENT**  
**2024\_2 EXAMINATION**

**CIT 314: COMPUTER ARCHITECTURE AND ORGANIZATION**      **Credit: 2½ units**

**TIME: 2 I/2 HOURS**

**INSTRUCTION:      Answer Four (4). Question one is Compulsory**

1a. The development of fault models is an essential part of the process in determining the reliability of a system. Examine four major goals exist when devising a fault model. (6 marks)

1b. Discuss the concept of protecting paging, highlight the merits and demerits of paging. (8 marks)

1c. With the aid of well-labelled diagram, describe two-phase communication protocol in asynchronous signaling conventions (6 marks)

1d. Briefly discuss the following in asynchronous circuits

h) Timing model      **(3 marks)**

ii) Mode      **(2 marks)**

2a. What is the key benefit of fault tolerance?(3 marks)

2b. Examine other mapping process similar to paging system.      (4 marks)

2c. Highlight the operations of floppy disk . **(8 marks)**

3a. One of the properties of logical space is that it uses variable-length segments. The length of each segment is allowed to grow and contract according to the needs of the program being executed. Describe one way of specifying the length of a segment. (2 marks)

3b. Examine the recording method of floppy disks      **(6 marks)**

3c. Describe the benefits of Asynchronous Control (7 marks)

4a. State and discuss internal registers being used by the CPU to exchange data with memory. **(4 marks)**

4b. Describe the function of the following in input/output operation: **(5 marks)**

- i. Program Counter (PC)
- ii. Instruction Register (IR):
- iii. Memory Address Register (MAR):
- iv. Memory Buffer Register:
- v. I/O address register (I/OAR):

I/O buffer register (I/OBR):

4c. With the aid of well-labelled diagram, describe the components of hard drives. **(7 marks)**

5a. Distinguish the external and internal drives.(4 marks)

5b. Describe a programming with parallel processing (5 marks)

5c. The directory structure records information such as name, location, size and type for all files stored on the storage devices. Highlight the issue(s) associated to single-Level directory and discuss solution provided by other directory structures **(6 marks)**

6a. List four examples of Asynchronous Communication. (2 marks)

6b. Examine the merits and demerits of multiprogramming in computer architecture. (6 marks)

6c. CD-ROM disks are one of the storage disks made of reflective metals and written during the process of manufacturing by high power laser beam. Highlight the characteristics of CD-ROM. (7 marks)