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... Bastion of Knowledge...

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**OFFICE OF THE DEPUTY PRINCIPAL
ACADEMICS, STUDENT AFFAIRS AND RESEARCH**

UNIVERSITY EXAMINATIONS

2019 /2020 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATION

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

MAIN EXAM

COURSE CODE: COM 300

COURSE TITLE: COMPUTER ARCHITECTURE

DATE: 17TH DECEMBER, 2019

TIME: 9.00 AM – 12.00 PM

INSTRUCTION TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF PRINTED PAGES

PLEASE TURN OVER

COM 300: COMPUTER ARCHITECTURE

STREAM: BSc (Computer Science)

DURATION: 3 Hours

INSTRUCTIONS TO CANDIDATES

- i. Answer *ALL* questions from section A and any *THREE* from section B.
- ii. Maps and diagrams should be used whenever they serve to illustrate the answer.
- iii. Do not write on the question paper.

SECTION A (24 MARKS) COMPULSORY

QUESTION ONE [12 MARKS]

- a. Define the term computer architecture. (2 Marks)
- b. Contrast between dedicated bus and multiplexed bus types (2 Marks)
- c. Contrast between master and slave with respect to bus system. (2 Marks)
- d. Describe the different types of computer system peripherals stating examples in each case. (3 Marks)
- e. Outline the different subsystem levels according to Handler's computer architecture classification scheme (3 Marks)

QUESTION TWO [12 MARKS]

- a. List the two types of information which flow into the processor with respect to Flynn taxonomy of computer architecture. (2 Marks)
- b. A computer system has system bus which performs different functions. Elaborate the different functions performed by buses. (4 Marks)
- c. Outline the different external device categories (3 Marks)

- d. Briefly explain the different modes through which the central processing unit interacts with the I/O devices. (3 Marks)

SECTION B [36 MARKS]

QUESTION THREE [12 MARKS]

- a. The system bus enables a computer system to function correctly. With respect to its content, explain why it is essential to a computer system (4 Marks)
- b. Clearly describe the different computer architecture categories with respect to information flow into the processor according to Flynn's taxonomy classification scheme. (8 Marks)

QUESTION FOUR [12 MARKS]

- a. For a user to interact with a computer system the peripheral devices have to interact with the CPU. Explain the three modes which the peripheral devices interact with the CPU. (6 Marks)
- b. The computer storage system is primarily subdivided in three types. Give a detailed description between the different types. (6 Marks)

QUESTION FIVE [12 MARKS]

- a. Describe the term bus width and how its quantity can affect the system performance. (2 Marks)
- b. List the types of operands typical of an instruction set. (4 Marks)
- c. Describe the categories of computer architecture. (6 Marks)

QUESTION SIX [12 MARKS]

- a. The address fields in a typical instruction format are relatively small. A variety of addressing techniques have been employed to reference a large range of locations in main memory. With the aid of diagrams, discuss how direct addressing, indirect addressing and register addressing techniques function. (12 Marks)

QUESTION SEVEN [12 MARKS]

- a. The most fundamental type of machine instruction is the data transfer instruction. Outline the fundamental things which the data transfer instruction must specify. (3 Marks)
- b. Explain when a system control instruction is performed. (3 Marks)
- c. Displacement addressing mode combines the capabilities of direct addressing and register indirect addressing. Describe three of the most common uses of displacement addressing. (6 Marks)