UNIRAZAK
UNIVERSITI TUN ABDUL RAZAK

FINAL EXAMINATION

NOVEMBER 2023

COURSE TITLE **COMPUTER ARCHITECTURE**

COURSE CODE **RCIT1233**

DATE/DAY **15 FEBRUARY 2024 / THURSDAY**

TIME/DURATION **02:00 PM - 04:00 PM / 02 Hour(s) 00 Minute(s)**

INSTRUCTIONS TO CANDIDATES :

1. Please read the instruction under each section carefully.
2. Candidates are reminded not to bring into examination hall/room any form of written materials or electronic gadget except for stationery that is permitted by the Invigilator.
3. Students who are caught breaching the Examination Rules and Regulation will be charged with an academic dishonesty and if found guilty of the offence, the maximum penalty is expulsion from the University.

(This Question Paper consists of 7 Printed Pages including front page)

DO NOT OPEN THE QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO

This question paper consists of TWO (2) sections. Answer ALL questions in the answer booklet provided. **[50 MARKS]**

SECTION A **(20 Marks)**

There are TWENTY (20) questions on this part of the examination paper. Answer ALL questions in the answer booklet.

1. The tangible part of a computer system is called _____.
   A. Input data
   B. Output data
   C. Hardware
   D. Software

2. Hexadecimal numbers are a mixture of _____.
   A. Octal and decimal numbers
   B. Binary and octal numbers
   C. Letters and decimal digits
   D. Binary and decimal numbers

3. Which of the following computer memory is the **FASTEST**?
   A. Register
   B. Hard disk
   C. RAM
   D. None of the mentioned

4. Which of the following computer memory is used to speed up the computer processing?
   A. Cache memory
   B. RAM
   C. ROM
   D. None of the mentioned

5. Which of the following method is used to carry out subtraction process in computers?
   A. 1's complement
   B. 2's complement
   C. Unsigned numbers
   D. Signed numbers

6. The idea of cache memory is based _____.
   A. on the property of locality of reference
   B. on the heuristic 90-10 rule
   C. on the fact that references generally tend to cluster
   D. all of the mentioned

7. Where does a tiny bootstrap loader program situate?
   A. Hard disk
   B. ROM
   C. BIOS
   D. None of the mentioned

8. What is the equivalent value of 1 Gigabyte (GB)?
   A. 1391 Megabytes (MB)
   B. 1024 Kilobytes (KB)
   C. 1024 Megabytes (MB)
   D. 1150 Megabytes (MB)

9. What is a digital-to-analog converter?
   A. It stores digital data on the computer.
   B. It converts alternating current (AC) into direct current (DC).
   C. It converts electrical power into mechanical power.
   D. It takes the digital data from an audio CD and converts it to a useful form.

10. The CISC stands for _____.
    A. Computer Instruction Set Compliment
    B. Complete Instruction Set Compliment
    C. Computer Indexed Set Components
    D. Complex Instruction Set Computer

11. How many bit(s) are needed to store one Binary Coded Decimal (BCD) digit?
    A. 1
    B. 2
    C. 3
    D. 4

12. Which of the following sets of logic gates are known as universal gates?
    A. XOR, NAND, OR
    B. OR, NOT, XOR
    C. NOR, NAND, XNOR
    D. NOR, NAND

13. The Sun micro systems processors usually follow _____ architecture.
    A. CISC
    B. ISA
    C. ULTRA SPARC
    D. RISC

14. A digital circuit that can store **ONLY** one bit is a _____.
    A. register
    B. NOR gate
    C. flip-flop
    D. XOR gate

15. Which of the following is **TRUE** about DeMorgan's Law?

A. (A+B)' = A'*B

B. (AB)' = A' + B'

C. (AB)' = A' + B

D. (AB)' = A + B

16. The logical sum of two or more than two logical products is termed as _____.

A. OR operation

B. Product of Sum (POS)

C. Sum of Product (SOP)

D. NAND operation

17. The purpose of developing CISC and RISC architectures are to reduce the _____.

A. Semantic gap

B. Time delay

C. Cost

D. Reduced Code

18. What are the equivalent bits of a one nibble?

A. 2

B. 4

C. 8

D. 16

19. Which of the following is NOT based on CISC architecture?

A. IBM 370/168

B. Motorola A567

C. Intel 80486

D. VAC 11/780

20. Which of the following method offers higher speed of Input/Output transfers?

    A. Interrupts

    B. Memory mapping

    C. Program-controlled Input/Output

    D. DMA

SECTION B **(30 Marks)**

There are TWO (2) questions in this part of the examination paper. Answer ALL questions in the answer booklet.

1. Input/Output (I/O) operations are accomplished through a wide assortment of external devices that provide a means of exchanging data between the external environment and the computer. An external device connected to an I/O module is often referred to as a peripheral device or simply, a peripheral.

    a) List down **THREE (3)** categories of external devices.

    (3 marks)

    b) Explain each of the categories mentioned in **Q1(a)**.

    (3 marks)

    c) List down **THREE (3)** techniques for Input/Output operations.

    (3 marks)

    d) Describe the **THREE (3)** techniques mentioned in **Q1(c)**.

    (6 marks)

2. The basic function performed by a computer is execution of a program, which consists of a set of instructions stored in memory. In its simplest form, instruction processing consists of two steps. The processor reads (fetches) instructions from memory one at a time, then executes each instruction. Program execution consists of repeating the process of instruction fetch and instruction execution. The exact sequence of events during an instruction cycle depends on the design of the processor but we could indicate on the process in general terms.

   a) List down any **FOUR (4)** registers that are essential to instruction execution.

   (4 marks)

   b) Define the **FOUR (4)** registers mentioned in **Q2(a)**.

   (4 marks)

   c) List down the **THREE (3)** types of Data Flow cycle.

   (3 marks)

   d) Describe any **TWO (2)** of the Data Flow cycle types mentioned in **Q2(c)**.

   (4 marks)

***** END OF QUESTION PAPER *****