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**Midterm Examination Cover Sheet**

***Spring- Semester: 1434-35 / 2014-2015***

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| **Course Instructor:** |  | **Exam Date:** |  |
| **Course Title:** | **Computer Organization** | **Course Code:** | **IT 110** |
| **Exam Duration:** | **2 Hour** | **Number of Pages:** (including cover page) | 10 **pages** |
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| **Exam Guidelines** | | | | | |
| * **Mobile phones are not permitted.** * **Calculators are permitted.** | | | | | |
| **Marking Scheme** | | | | | |
| **Questions** | | **Score** | | | |
| **Q1** | |  | | | |
| **Q2** | |  | | | |
| **Q3** | |  | | | |
| **Q4** | |  | | | |
| **Q5** | |  | | | |
| **Final Total Score / 25** | |  | | | |
| **Student Name:** |  | | **Student ID:** |  |
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**Section** 1: Multiple Choice Questions

Q1. For the following MCQs, circle one correct answer.

1. In a client-server architecture, the only limitations to running multiple applications on a single server are the potential slowdowns that may result from the load on the server computer and

a) traffic on the Internet.

b) load on client computer.

c) users who open many web browsers.

**d) the traffic on the network to that server.**

1. In order to get a left shift a number we can perform :

**a) multiply .**

b) addition .

c) dividing.

d) subtraction.

1. In order to divide a number by its base we can perform

a) a bit op

b) a left shift

**c) a right shift**

d) a complex equation

1. Information that describes or interprets the meaning of the data is known as

a) ASCII.

b) analog.

c) EBCDIC.

**d) metadata.**

1. Increasing or decreasing the number of pixels per inch changes the

a) codec.

b) amplitude.

**c) resolution.**

d) color depth.

1. To correct for carries and borrows that occur when large numbers must be separated into parts to perform additions and subtractions, we use

a) a bit hold.

**b) a carry flag.**

c) an error flag.

d) an overflow flag.

1. Shifting numbers left and increasing the exponent until leading zeros are eliminated is called

a) conversion.

b) factorization.

**c) normalization.**

d) excess notation

1. The exponent of a floating point number is stored using

**a) excess N notation.**

b) one's complement.

c) two's complement.

d) binary coded decimal.

1. Which sequence of commands is needed to enter two numbers into the LMC (using the INPUT command)?

a) INPUT, ADD, INPUT

b) INPUT, LOAD, INPUT

**c) INPUT, STORE, INPUT**

d) INPUT, ENTER, INPUT

1. The BRANCH ON ZERO instruction "jumps" if the value in the

a) mailbox is zero.

b) in basket is zero.

**c) calculator is zero.**

d) instruction location counter is zero

1. The register that holds the address of the memory location that needs to be accessed is called the

a) IR.

**b) MAR.**

c) MDR.

d) MBR.

1. The register that holds the current instruction is called the

**a) IR.**

b) PC.

c) LMC.

d) MBR.

1. Memory that retains its values when power is removed is called

a) DRAM.

b) SRAM.

c) volatile.

**d) nonvolatile.**

1. Computers provide interrupt capability by providing one or more special control lines to the central processor known as

a) fault lines.

b) address lines.

**c) interrupt lines.**

d) instruction lines.

1. The program that determines the appropriate course of action in the event an interrupt occurs is called the

a) fault handler.

b) device handler.

**c) interrupt handler .**

d) instruction handler.

16. ) What protocol is used to discover the relation between an IP address and a corresponding MAC address?

**a) ARP**

b) L2TP

c) HDLC

d) CSMA/CD

17. TCP establishes a connection at the request of a network application. To initiate a connection, TCP sends a control packet to TCP at the Web site, requesting a connection; this results in a brief back-and-forth series of requests and acknowledgments known as

a) binding.

b) collaborating

**c) handshaking.**

d) service handling.

18. What is the abbreviation for the protocol that translates domain names into IP addresses?

a) NAT

b) UDP

**c) DNS**

d) DHCP

19. In part, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ focuses on methods to reserve and prioritize channel capacity to favor packets that require special treatment.

a) DNS

**b) QoS**

c) TCP/IP

d) Ethernet

20. Protecting the content of data communication against changes is known as

**a) integrity.**

b) encryption.

c) confidentiality.

d) authentication.

21. UDP stands for

a) User Determined Protocol.

**b) User Datagram Protocol.**

c) Unit Datagram Protocol.

d) Unit Determined Protocol.

22. Transport layer in OSI has s protocols \_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_ .

a) DHCP , ARP .

b) TCP , IP .

**c) TCP , UDP .**

d) UDP , IP .

23. Increasing the number of bits available for the op code in an instruction word

a) increases the demand on the CPU.

b) increases the number of memory locations that can be addressed.

**c) increases the number of instructions available in the instruction set.**

d) has no impact on any of the above.

24. Memory that useful in very-high-speed computers and for small amounts of high-speed memory

**a) SRAM.**

b) DRAM.

c) ROM.

d) DDROM.

25. In Symmetrical Multiprocessing (SMP) each CPU has

a) identical access to memory.

b) identical access to the I/O and memory.

c) identical access to the operating system, I/O and memory

**d) identical access to the operating system, and to all system resources, including memory.**

**Section 2: True/False**

**Questions**

**Q2. Answer the following questions with TRUE or FALSE:**

1. The fact that different types of computers can work together, share files, and communicate successfully is known as supercomputing ( false )
2. Storage devices communicate with a computer using protocols.

One such protocol isfor example : SATA ( true )

1. JPEG is image file format is best used for photographs of real-world objects ( true )
2. The leftmost bit in an IEEE standard floating point number represents the sign of the mantissa . ( true )
3. Interrupts that can never be temporarily disabled by program instructions are called maskable . ( false )
4. Interrupts are normally checked after one instruction is finished and before another begins .

( true )

1. Data from disks, and tapes, and flash memory are transferred only in blocks of data .

( true )

1. On a modern hard disk, what is the typical size of a block of data 512 bytes .

( true )

1. IPv6 has 128-bit addresses arranged as 8 groups of four-digit hexadecimal numbers separated by colons . ( true )
2. MAC stands for mediate-access control address. ( false )

**Section 3: Fill in the blank Questions**

**Q2. Answer the following questions with keywords :**

1. As a matter of necessity, network interfaces must conform to standard agreements, known as \_\_\_\_\_\_\_\_\_\_\_ **,** for messages to be understood by both computers during a message exchange between a pair of computers.
2. A two-tier architecture simply means that there are \_\_\_\_\_\_\_\_ computers involved in the service.
3. In \_\_\_\_\_\_\_\_\_\_\_\_ number 7+5 = 14 .
4. Using sign-and-magnitude representation, the largest positive number that can be stored in 8 bits is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
5. When adding two numbers using 2's complement, carries beyond the leftmost digit are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. The 1-bit registers that are used to allow the computer to keep track of special conditions (like overflow or power failure) are often called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .
7. The time it takes the read/write head to move to the correct track is\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_\_\_\_\_\_\_\_\_\_ topology consists of point-to-point connections from each node on the network to the next node; the last node on the network is connected back to the first and there is no central hub.
2. The variation in delay from packet to packet is known as \_\_\_\_\_\_\_\_\_.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Standard global domain name system provides global scope for user friendly addresses.

**Solution of blanks : { protocols - Two - octal - 127 - ignored - flags – seek time - ring - jitter – domain name } .**

Q4 : Classify the registers as either

a) holding addresses only,

b) holding instructions only,

c) anything.

IR \_\_\_\_

PC \_\_\_\_

MAR \_\_\_\_

MDR \_\_\_\_

Accumulator \_\_\_\_

**Sol:**

**IR (b) holding instructions only**

**PC (a) holding addresses only**

**MAR (a) holding addresses only**

**MDR (c) anything**

**Accumulator (c) anything**

Q5 : Explain why it is better to have an I/O device initiate an interrupt to the CPU rather than the CPU monitor the I/O device. (Two or three sentences should be adequate to answer this question)

**Sol:**

**Monitoring I/O devices is considered polling, which is inefficient for the CPU. By having**

**the I/O device initiate communication to the CPU through an interrupt, it frees the CPU to**

**perform other tasks.**

Q6 : Write a program to evaluate the arithmetic statement:

X = (A - B) \* ( ( (C - D \* E ) / F ) / G)

Using a general register computer with three address instructions and evaluate the total of Memory reference .

**Sol:**

**Code Memory reference(register)**

SUB R1, A, B 2

MUL R2, D, E 2

SUB R2, C , R2 1

DIV R2, R2 , F 1

DIV R2, R2 , G 1

MUL X, R1, R2 1

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**Total of Memory reference = 8**

Q7 : **:** Compare CISC and RISC with respect to their characteristics.

**Sol:**

|  |  |
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| **CISC** | **RISC** |
| 1. Complex Instruction Set Computer. | 1. Reduced Instruction Set Computer. |
| 2. Variable length instruction format. | 2. Fixed length, easily decoded instruction format. |
| 3. A large variety of addressing modes. | 3. Few addressing modes. |
| 4. A large number of instructions. | 4. Relatively few instructions. |

Q8 : What is the average rotational latency of a hard drive rotating at 120 revolutions per second by assume there are 30 sectors per track.

**Sol:**

1 1

**average latency time = ---------- x ----------------------------**

**2 rotation speed**

**1 1**

**Average latency time = ---------- x ------------------ = 0.004167 sec or 4.167 millisecond**

**2 120 rev/sec**

Q9 : Write a short note on any four categories of network security?

**Sol:**

1. Intrusion: Keeping network and system resources free from intruders
2. Confidentiality: Keeping the content of data private
3. Authentication: Verifying the identity of a source of data being received
4. Data integrity and non-repudiation: Protecting the content of data communication against changes and verifying the source of the message
5. Assuring network availability and access control: Keep network resources operational and restricting access to those permitted to use them