



Catholic University Institute of Buea (CUIB)
2020/2021 ACADEMIC YEAR
First Semester Examinations – February/March 2021

EoC

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|----------------------|-------------------------------|--------------|---|------|-----------------------------|
| School | INFORMATION TECHNOLOGY | | | | |
| Course Code | SIT 101 | Course Title | Introduction to Information Technology | | |
| Status | C | Credit Value | 6 | Dept | Software Engineering |
| Date | 27/02/2021 | Venue | Ngongi H./ LH 1 | Time | 8:00AM – 10:00AM |
| Course Instructor(s) | Mrs. Tiako Fani N. | | | | |

INSTRUCTIONS

1. Answer **ALL** questions from all sections.
2. Penalty will be given for poor presentation of answers.
3. Only calculators are allowed.

SECTION A: Theoretical Knowledge (25 marks)

1. Briefly present the four components of an Information Technology. (2 marks)
2. Distinguish between data, information and knowledge. (2 marks)
3. What is the purpose of each of the following concepts: Data analytics and Data Archiving? (2 marks)
4. Name a device that can be used for both input and output. (1 mark)
5. How many Kilobits (Kb) are in five Terabytes (5TB)? (1 mark)
6. Client/Server and Peer-to-Peer are the two main categories of network architectures. Briefly describe the difference between them. (2 marks)
7. What is Software Piracy? Briefly present 2 examples. (2 marks)
8. Give one example of a System Software and one example of an Application Software. (1 mark)
9. If you change Windows 7 to Windows 8, did you perform a patch, an update or an upgrade? (1 mark)
10. Distinguish between freeware and shareware. (2 marks)
11. What are the five elements of multimedia? (2 marks)
12. What is a virus and how can it be counteracted? (1 mark)
13. For each of the following Internet activities, give one example of software that does the activity mentioned over the Internet: Electronic mail, File Transfer, Instant Messaging and Video Conferencing, Commerce. (2 marks)
14. Give two Examples of search engines. (1 mark)
15. Briefly explain how secret key cryptography works. (1 mark)
16. What is the use of an IP address in a network? (1 mark)
17. Briefly differentiate between the Internet and the Web. (1 mark)

SECTION B: Practical Knowledge (25 marks)

1. The processing speed of a computer depends on a number of factors, such as those listed below: (3 marks)
 - a. Clock rate of the CPU
 - b. Main memory (RAM) size
 - c. Cache memory

For each above factor, briefly state why the factor is relevant in determining the CPU's speed.
2. Perform the following conversions between number bases (Show all steps!!): (2 marks)



- Convert $(2519)_{10}$ to binary, octal and hexadecimal
- Convert $(101001)_2$ to Decimal.

- Consider the table below showing arrival times and execution times for four processes.
 - Draw a chart showing their execution for FCFS. (1 mark)
 - Draw a chart showing their execution for RR with quantum = 4. (2 marks)

| Process | Arrival Time | Execution Time |
|---------|--------------|----------------|
| P0 | 0 | 5 |
| P1 | 3 | 9 |
| P2 | 10 | 2 |
| P3 | 12 | 6 |

- A process requires 5KB of memory. The memory manager currently has the following list of unallocated blocks: 2KB, 9KB, 5KB, 3KB, 22KB, 17KB. In which block of memory will the process be placed when using:
 - Best Fit
 - Worst Fit
 - First Fit
 - Which allocation will result in the least fragmentation?
 (4 * 0.5 = 2 marks)

- Consider the paging management scheme below: (2 marks)

| |
|--------|
| Page 4 |
| Page 3 |
| Page 2 |
| Page 1 |
| Page 0 |

Logical Memory

| | |
|---|---|
| 0 | 2 |
| 1 | 7 |
| 2 | 0 |
| 3 | 3 |
| 4 | 9 |

Page Table

| | |
|---|--|
| 9 | |
| 8 | |
| 7 | |
| 6 | |
| 5 | |
| 4 | |
| 3 | |
| 2 | |
| 1 | |
| 0 | |

Physical Memory

Complete the contents of physical memory to aid in the address translation process.

- Write an algorithm for finding the maximum of 4 numbers A, B, C and D. (2 marks)
- Managing an inter-city crops delivery company Food Express. State one way IT benefit Food Express. (1 mark)



8. Consider the following software for an electricity company's billing department and create a decision table. (3 marks)

If the customer account is billed using a fixed rate method, a minimum monthly charge is assessed for consumption of less than 100 kwh. Otherwise, apply a schedule A rate structure. However, if the account is billed using a variable rate method, a schedule A rate structure will apply to consumption below 100 kwh, with additional consumption billed according to schedule B.

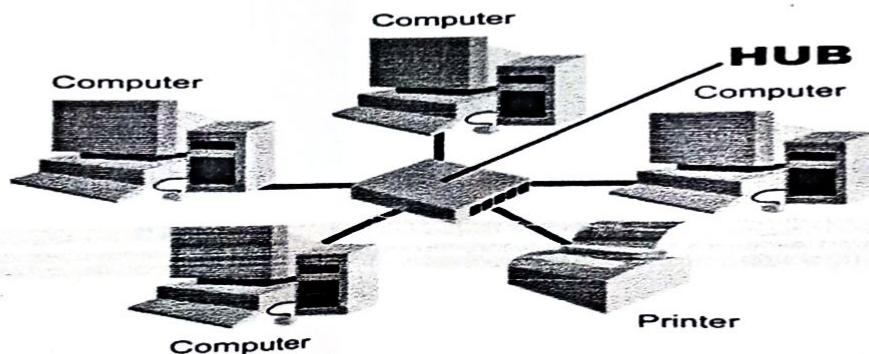
9. Consider a language with 4 characters: b, c, e and y with respective frequencies of occurrence: 0.05, 0.35, 0.55 and 0.05 respectively. The following table shows the bits used to represent each character for variable length coding:

| Character | b | c | e | y |
|---------------------|-----|----|---|-----|
| Representation Bits | 110 | 10 | 0 | 111 |

- a. Why is the character "e" represented with a single bit? (1 mark)
- b. Given the above table, compress the text "ceybeceey". (1 mark)

10. A computer network is a collection of two or more computers, which are connected together to share information and resources.

- a. Cite two basic topologies that exist. (1 mark)
- b. Identify the type of network topology in the diagram below. (1 mark)



11. There is a table named SHOP that has three columns: Shelf, Row and NumberOfItems. The first two columns are character types and the last column is a numeric type. Write the appropriate SQL queries for the following:

- a. Show Shelf and NumberOfItems for all shelves with more than 30 items. (2 marks)
- b. Show the NumberOfItems in the shelf 'SH34'. (1 mark)

