

UNIVERSITY OF GHANA



FIRST SEMESTER UNIVERSITY EXAMINATIONS: 2017/2018

DEPARTMENT OF COMPUTER SCIENCE

CSIT 103: INTRODUCTION TO COMPUTING (3 CREDITS)

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TIME ALLOWED: 2 HOURS

ANSWER ALL QUESTIONS - [25 MARKS]

MULTIPLE CHOICE QUESTIONS

1. A small group of bits treated as a single unit is called as
 - a. bits
 - b. binary characters
 - c. input characters
 - d. bytes

1. A mail merge is most commonly achieved using the following software package(s)
 - a. spreadsheet and database
 - b. word-processor and graphics package

- c. electronic mail system
- d. word-processor and database

2. The manager of a leisure centre wishes to estimate the likely effect on profits of a decrease in entry price by examining the consequences of estimated increase in the number of people using the centre. What would be a suitable software package to aid him with the calculations?

- a. an expert system
- b. a spreadsheet
- c. a presentation graphics package
- d. a maths package

1. The Data Protection Act makes it an offence to
 - a. hold personal data longer than necessary
 - b. run pirated software
 - c. gain unauthorised access to computer programs or data
 - d. copy software

1. A typical use of a WORM (Write Once Read Many) storage device is
 - a. archiving data such as copies of invoices
 - b. recording music for a CD
 - c. storing the operating system of a computer
 - d. making regular backup copies of master files held on disks

2. What is the objective of a test strategy for a new program?
 - a. to ensure that the program compiles without errors
 - b. to prove that the program has no errors
 - c. to establish which data will allow the program to run without crashing
 - d. to try to provoke program failure

3. The number -19 translated into an 8-bit two's complement binary integer is
 - a. 10010011
 - b. 11101101
 - c. 00010011
 - d. 11101100

4. The positive binary number 10101111 translated into hexadecimal is
 - a. AE
 - b. AF
 - c. BE
 - d. BF

5. Two registers involved in the fetch-execute cycle are:

- a. The program counter and the stack pointer
 - b. The status register and the program counter
 - c. The memory address register and memory data register
 - d. The accumulator and the current instruction register
6. The address bus of a certain computer has 16 lines. What is the maximum number of addressable memory cells?
- a. 16
 - b. 256
 - c. 65535
 - d. 65536
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- a. 16
 - b. 256
 - c. 65535
 - d. 65536
8. RAM cache is
- a. A small amount of fast memory between main memory and the processor
 - b. Memory reserved for use by the operating system
 - c. The computer's main random access memory for storing programs and data
 - d. Memory used by the VDU for storing the screen image.
9. Which of the following sources of interrupt has the highest priority?

- a. Division by zero
- b. Memory parity error
- c. Real-time clock
- d. Keyboard key pressed

10. Which of the following instructions will set the most significant 4 bits of an 8-bit register to zero, while leaving the last four unchanged

- a. AND 00001111
- b. OR 00001111
- c. OR 11110000
- d. XOR 00001111

11. A device which combines more than one type of input signal into a single stream of data which can be transmitted over a single communication channel is known as

- a. A modem
- b. A multiplexor
- c. An optic fibre line
- d. A front-end processor

12. Which of the following statements is true of a packet switching network?

- a. The cost depends on the distance transmitted
- b. Data packets for a single transmission always travel by a single route
- c. The size of the packet depends on the number of characters in the message
- d. The cost depends on the number of packets sent*

13. In a token ring network:

- a. Messages can be passed around the ring in either direction
- b. Several message tokens can simultaneously be passed around the ring
- c. The message is passed to the correct recipient by a central computer
- d. Each node has to 'grab' the token at a designated time and send or receive a

message

14. A multi-programming computer is one which:

- a. Is capable of running two or more programs apparently simultaneously
- b. Has several procesors working in parallel
- c. Runs only real-time programs
- d. Runs only in batch mode

15. A function of the scheduler is to

- a. Ensure hardware resources are kept free for when they are needed
- b. Ensure that one process does not accidentally access another's memory

locations

- c. Provide acceptable response times to interactive users
- d. Select a scheduling algorithm to achieve maximum throughput

16. The use of virtual memory:

- a. Results in faster execution speeds
- b. Creates the illusion that a computer has more main memory than it in fact has
- c. Ensures disk space is used efficiently
- d. Ensures that all programs are relocatable

17. A process may be at any time running, runnable or suspended. Which of the following statements is true?

- a. A process will join the queue of suspended if, while it is running, its time slice

expires

- b. A process is runnable if its waiting for an I/O device to become free
- c. A process is suspended if its waiting for an I/O device to become free
- d. A process is running if it is in memory, waiting for the processor to become free

18. Which of the following terms best describes the While...Do...EndWhile program structure?

- a. Sequence
- b. Selection
- c. Iteration
- d. Recursion

19. Which type of language would be suitable for programming an expert system?

- a. Procedural
- b. Declarative
- c. Imperative
- d. Low-level

20. Which of the following is a suitable language to use to program a device driver (e.g. a printer)?

- a. COBOL
- b. Prolog
- c. Pascal
- d. Assembly language

21. Head returns the first element of a list and Tail returns a new list containing all but the first element of the list. What is returned by the operation Tail(Tail(Tail(List))) where List = [Accra, Hohoe, Kumasi, Tamale, Santrokofi]

- a. [] empty list
- b. [Santrokofi]
- c. [Tamale, Santrokofi]
- d. [Kumasi, Tamale, Santrokofi]

SECTION B. ANSWER ANY THREE QUESTIONS IN THIS SECTION. ALL QUESTIONS CARRY

EQUAL MARKS [25MARKS]

B1

Plastic cards with magnetic stripes were commonly used in the banking and credit card industries in the 1980s. In one type of magnetic stripe system, cards are encoded with the following information:

Customer account number;

Personal identification number (PIN) held in encrypted form;

Customer's bank branch identification code;

Customer's daily cash withdrawal limit.

The data is stored on two separate tracks within the magnetic stripe. One of these tracks is read only, the other is a read-write track.

i) Identify two other items of data which are likely to be stored on the stripe, and explain why they are necessary.

- iii) State which of the six items of data would be stored on the read only track and which would be stored on the read-write track.
- iv) Describe the processing stages which follow when a card is inserted into a cash dispenser with the intention of withdrawing some cash.

B2

An expert system attempts to automate the knowledge and reasoning of human expert.

- i) Name and describe the functions of the components of an expert system.
- ii) Is it important for an expert system to justify its reasoning?
- iv) State two differences between an expert system and a human expert.

B3

- i) Describe the fetch-execute cycle. Explain the use of internal registers in the fetch process.
- ii) Describe what happens when a peripheral device interrupts the processor
- iii) Explain why interrupts are allocated different levels of priority
- iv) Explain what happens when the cpu is servicing a keyboard interrupt and an interrupt arrives from the line printer

B4

- i) What is a stack?
- ii) What is a stack pointer?
- iii) With the aid of a clearly labeled diagram which includes a stack pointer, describe how a previously empty stack would hold these names arriving in the given sequence:

Eyram, Tom, Adzo, Serwaa, Yao, Abena
- iv) Show what the stack would then have if three of these names were popped (retrieved) from it and a further name Kofi added.