



UNIVERSITY OF GHANA

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B.A/BSc., FIRST SEMESTER UNIVERSITY EXAMINATIONS: 2017/2018

DEPARTMENT OF COMPUTER SCIENCE

CSIT 103: INTRODUCTION TO COMPUTING (3 CREDITS)

**INSTRUCTION:**

*Answer ALL Questions in Section A*

*Answer Any Other THREE (3) Question in Section B*

**TIME ALLOWED:**

*TWO (2) HOURS*

**SECTION A [25 Marks]**

**Answer ALL questions in this section**

1. A small group of bits treated as a single unit is called as
  - a. bits
  - b. binary characters
  - c. input characters
  - d. bytes
2. 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
3. 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
4. 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

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5. 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
6. 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
7. The number -19 translated into an 8-bit two's complement binary integer is
  - a. 10010011
  - b. 11101101
  - c. 00010011
  - d. 11101100
8. The positive binary number 10101111 translated into hexadecimal is
  - a. AE
  - b. AF
  - c. BE
  - d. BF
9. 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
10. 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
11. The address bus of a certain computer has 16 lines. What is the maximum address?
  - a. 16
  - b. 256
  - c. 65535
  - d. 65536
12. 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.
13. 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

14. 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
- AND 00001111
  - OR 00001111
  - OR 11110000
  - XOR 00001111
15. 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 modem
  - A multiplexor
  - An optic fibre line
  - A front-end processor
16. Which of the following statements is true of a packet switching network?
- The cost depends on the distance transmitted
  - Data packets for a single transmission always travel by a single route
  - The size of the packet depends on the number of characters in the message
  - The cost depends on the number of packets sent
17. In a token ring network:
- Messages can be passed around the ring in either direction
  - Several message tokens can simultaneously be passed around the ring
  - The message is passed to the correct recipient by a central computer
  - Each node has to 'grab' the token at a designated time and send or receive a message
18. A multi-programming computer is one which:
- Is capable of running two or more programs apparently simultaneously
  - Has several processors working in parallel
  - Runs only real-time programs
  - Runs only in batch mode
19. A function of the scheduler is to
- Ensure hardware resources are kept free for when they are needed
  - Ensure that one process does not accidentally access another's memory locations
  - Provide acceptable response times to interactive users
  - Select a scheduling algorithm to achieve maximum throughput
20. The use of virtual memory:
- Results in faster execution speeds
  - Creates the illusion that a computer has more main memory than it in fact has
  - Ensures disk space is used efficiently
  - Ensures that all programs are relocatable
21. A process may be at any time running, runnable or suspended. Which of the following statements is true?
- A process will join the queue of suspended if, while it is running, its time slice expires

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- 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
22. Which of the following terms best describes the While...Do...EndWhile program structure?
- a. Sequence
  - b. Selection
  - c. Iteration
  - d. Recursion
23. Which type of language would be suitable for programming an expert system?
- a. Procedural
  - b. Declarative
  - c. Imperative
  - d. Low-level
24. 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
25. 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 [75 Marks]

Answer Any Other THREE (3) Question from this section [25 Marks Each]

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.
- ii. 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.
- iii. 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?
- iii. 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.

STUDENT ID: ..... SIGN: .....

# UNIVERSITY OF GHANA



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## BSC INFORMATION TECHNOLOGY SUPPLEMENTARY RESIT EXAMINATIONS: 2022/2023

### DEPARTMENT OF DISTANCE EDUCATION

### CSIT 103: INTRODUCTION TO COMPUTING (3 Credits)

**INSTRUCTION:** Attempt ALL questions. Use ink to write the correct answered letter to each question in the answer table below and return it with the entire question paper.

**TIME ALLOWED:** ONE AND HALF (1.5) HOURS

1		18		35	
2		19		36	
3		20		37	
4		21		38	
5		22		39	
6		23		40	
7		24		41	
8		25		42	
9		26		43	
10		27		44	
11		28		45	
12		29		46	
13		30		47	
14		31		48	
15		32		49	
16		33		50	
17		34		END	

EXAMINER: F.A. KATSRUKU/S.A.ADINGO

1. 1 kilobyte is equivalent to how many bytes of memory
  - a. 1000
  - b. 1020
  - c. 8
  - d. 1024
2. Which of the following is NOT a unit of measurement of memory capacity?
  - a. Fb
  - b. Gb
  - c. Mb
  - d. Tb
3. What is its value if it represents an 8-bit two's complement?
  - a. -90
  - b. -38
  - c. 6A
  - d. A6
4. What is its value if it represents an 8-bit sign and magnitude integer?
  - a. A6
  - b. -90
  - c. 6A
  - d. -38
5. What is its value if it represents a hexadecimal number?
  - a. A6
  - b. -90
  - c. 6A
  - d. -38

Question 6 – 8 select the best options to complete the sentence.

A \_\_\_\_Q6\_\_\_\_ is a device that works under the control of stored programs, automatically accepting, storing and processing \_\_\_\_Q7\_\_\_\_ to produce \_\_\_\_Q8\_\_\_\_.

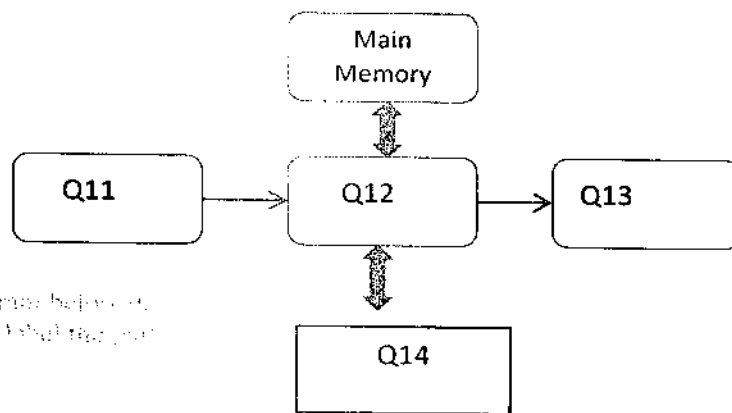
- a) Data
- b) Machine
- c) Information
- d) Computer

Which word best completes the following sentence: A program is a set of \_\_\_\_\_ that is written in the language of the computer.

- a. Codes
  - b. Signs
  - c. words
  - d. instructions
9. The electronic and mechanical elements of the computer are known as what?
    - a. Devices
    - b. Peripherals
    - c. Hardware
    - d. Software

10. What term is used to describe all the various programs that may be used on a computer system.
  - a. Codes
  - b. Software
  - c. Instructions
  - d. Programs

The diagram below depicts a block diagram of a basic computer system. Use the options below it to correctly label the parts for questions 11- 14.



The diagram below is a block diagram of a basic computer system. Use the options below it to correctly label the parts for questions 11- 14.

The diagram below is a block diagram of a basic computer system. Use the options below it to correctly label the parts for questions 11- 14.

- a. Output device
- b. Auxiliary Storage
- c. CPU
- d. Control Unit

15. 1 kilobyte is equivalent to how many bytes of memory

- a. 1000
- b. 1020
- c. 8
- d. 1024

16. Which of the following is NOT a unit of measurement of memory capacity?

- a. Fb
- b. Gb
- c. Mb
- d. Tb

17. How many characters can be stored in 802 bytes of memory?

- a. 1000
- b. 1604
- c. 802
- d. 641

18. Given that a one page document can hold 3290 characters, approximately how many pages will be required for a document that occupies 1.5Mb of memory?

- a. 1572864
- b. 478
- c. 26320
- d. 411

19. Which of the following is NOT a recognized classification of a computer?

- a. Minicomputer

Examiner: F. A KATSRIKU & S.A. ADINGO



- b. Supercomputer
- c. Microprocessor
- d. Mainframe

20. An embedded computer will perform which of the following functions?

- a. Control of traffic lights
- b. Temperature measure
- c. Humidity control
- d. All of the above

21. Software may be defined as the intangible parts of the computer, True or False?

- a. True
- b. False

22. Which of the following may not be classified as a systems software?

- a. Commercial packages
- b. Microsoft word
- c. User programs
- d. All of the above

23. Which of the following is not a systems software?

- a. GUI
- b. Operating System
- c. System services
- d. Microsoft Excel

24. All of the following are functions of system software except

- a. Develop an algorithm for a problem
- b. Optimize the performance of the computer system
- c. Provide assistance with program development
- d. Simplify the use of the computer system

25. After compiling a program written in a high level language the output you obtain is known as

- a. Machine language
- b. Object code
- c. Assemble language
- d. Target code

26. All operations within the computer are performed in which of the following units?

- a. ALU
- b. Control unit
- c. Register
- d. Cache

27. Which of the following actually constitutes the computer?

- a. ALU
- b. Control unit
- c. CPU
- d. Motherboard

28. The fundamental storage unit is a bit which can be in an OFF or ON state. How many different codes are possible with 5 bits?

- a.  $5 \times 2$
- b.  $5^2$
- c.  $2^5$

d.  $2^5-1$

29. How many bits would you need to represent the 26 letters of the alphabet, lower case and upper case?

- a. 52
- b. 26
- c. 8
- d. 6

30. For each byte of memory, computers will have an extra bit used for error detection, this bit is known as what?

- a. Parity bit
- b. Error bit
- c. Even bit
- d. None of the above

29. How many

lower case and upper

31. A bus is a set of \_\_\_\_\_ used to connect components within the computer

- a. Lines
- b. Codes
- c. Wires
- d. Jumpers
- e.

32. Which of the following is an example of a bus?

error detection, this bit is

- a. Data bus
- b. Computer bus
- c. Memory bus
- d. None of the above

33. Which bus is used to indicate the location from which data is to be retrieved or written?

- a. Control bus
- b. Memory bus
- c. Data bus
- d. Address bus

34. Which of the following is not a feature of cache memory?

- a. It is closer to the CPU
- b. It may use a dedicated control bus
- c. It may use high speed components
- d. Has large capacity relative to main memory

35. Which of the following principles will a cache memory rely upon?

error?

- a. Locality of reference
- b. Moore's law
- c. High speed components
- d. None of the above

36. Which of the following principles is used by cache memory

- a. Data locality
- b. Spatial locality
- c. High speed components
- d. None of the above

29. How many

37. Which of the following correctly shows the place values in denary number system?

- a. 

$10^3$	$10^2$	$10^1$	$10^0$
--------	--------	--------	--------
- b. 

$10^3$	$10^2$	$10^1$	10
--------	--------	--------	----
- c. 

$10^3$	$10^2$	100	$10^0$
--------	--------	-----	--------
- d. None of the above

38. Which of the following steps correctly shows how to convert the following 000111101010100 into hexadecimal?

- i. Divide the binary into groups of four starting from the left most, write the denary for each group, convert each denary into its hexadecimal equivalent
- ii. Divide the binary into groups of four starting from the right most, write the denary for each group, convert each denary into its hexadecimal equivalent
- iii. None of the above

39. What is the hexadecimal equivalent of the binary number in Q39 above \_\_\_\_\_

- a. 3D54
- b. D354
- c. 15700
- d. None of the above

40. Which of the following is the correct representation of the place values in two's complement?

- a. 

128	64	32	16	8	4	2	1
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
- b. 

-128	64	32	16	8	4	2	1
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
- c. 

128	64	32	16	8	4	2	0
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
- d. 

-	64	32	16	8	4	2	0
128	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

41. Which of the following is a correct representation the two's complement of -17?

- a. 

1	0	0	0	1	0	0	1
---	---	---	---	---	---	---	---
- b. 

0	0	0	0	1	0	0	1
---	---	---	---	---	---	---	---
- c. 

1	1	1	0	1	1	1	1
---	---	---	---	---	---	---	---
- d. 

1	1	1	0	1	0	0	1
---	---	---	---	---	---	---	---

42. If the denary number 373 is to be converted to a binary representation, how many bits will be needed?

- a. 2

- b. 4
  - c. 9
  - d. 8
43. Given that data can only be stored using an integer number of bytes, how bytes are required to store the number 373?
- a. 1
  - b. 2
  - c. 3
  - d. 4
44. A bitmap has an image stored that has resolution of 1024 x 768 and a colour depth of 8. Another file contains a five-minute soundtrack stored using a sampling rate of 100 samples per second and a sampling resolution of 16. What is the size of the bitmap image file?
- a. 6,291,456
  - b. 60,000
  - c. 1024
  - d. 786432
45. Which of the following is an example for which lossless compression is essential?
- a. Text document
  - b. Sound
  - c. Video
  - d. Image
46. Which of the following is not true about bitmapped graphics?
- a. They are used to capture scanned images from paper document
  - b. They can be used to scan photograph
  - c. They can be used for drawings for specialist applications such as flowcharts and object-oriented class diagrams
  - d. None of the above

Use the following to Q47 – 49. Binary representation is used for many different data values. Consider the binary pattern  
1 0 10 0 1 1 0

47. What is its value if it represents an 8-bit two's complement?
- a. -90
  - b. -38
  - c. 6A
  - d. A6
48. What is its value if it represents an 8-bit sign and magnitude integer?
- a. A6
  - b. -90
  - c. 6A
  - d. -38
49. What is its value if it represents a hexadecimal number?
- a. A6
  - b. -90
  - c. 6A
  - d. -38
50. Abacus is an early form of a mechanical computer, TRUE or FALSE
- e. TRUE
  - f. FALSE