REPUBLIC OF CAMEROON
Peace- Work-Fatherland
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MINISTRY OF SECONDARY EDUCATION
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SOUTH REGIONAL DELEGATION
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TEACHERS' RESOURCE UNIT
P.O. BOX 77 TEL: 222-284-190

South Regional Mock Examinations — SOREMEX

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie
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MINISTÈRE DES ENSEIGNEMENTS SECONDAIRES
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DÉLÉGATION RÉGIONALE DU SUD
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CELLULE D'APPUI A L'ACTION PEDAGOGIQUE
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MARCH 2024 **ADVANCED LEVEL**

The Teachers' Resource Unit in collaboration with the Regional Inspectorate of Pedagogy	SUBJECT CODE NUMBER **0795**	PAPER NUMBER **1**
GENERAL CERTIFICATE OF EDUCATION REGIONAL MOCK EXAMINATIONS	SUBJECT TITLE COMPUTER SCIENCE	
CANDIDATE NAME: …… CANDIDATE NUMBER: …… CENTRE NUMBER: ……	**DATE** **Friday 22nd March 2024** **(AFTERNOON)**	

Time Allowed: **ONE AND A HALF HOURS**

INSTRUCTIONS TO CANDIDATES

Mobile phones are NOT allowed in this examination room.

MULTIPLE CHOICE QUESTION PAPER

INSTRUCTIONS TO CANDIDATES

Read the following instruction carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed "**Advanced Level – 0795 COMPUTER SCIENCE 1"**
4. Fill in the information required in the spaces above.
5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil:
   Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Identification Number. Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.

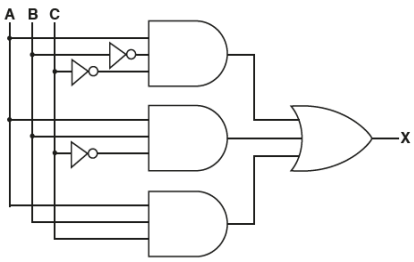
How to answer the questions in this examination

6. Answer **ALL** the **50** questions in this examination. All questions carry equal marks.
7. Each question has FOUR suggested answers: **A, B, C** and **D.** Decide on which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.
   For example, if **B** is the correct answer, mark **B** as shown below:
   [A] ~~[B]~~ [C] [D]
8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, and then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. **Calculators are allowed.**
11. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
12. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH ANY.**

Use the following to answer questions 1, 2 & 3

Real numbers are stored in a computer system using floating-point representation with: **10 bits for the mantissa**, **6 bits for the exponent & two's complement form for both the mantissa and the exponent.**

1. What is the normalized floating-point representation of –7.25 in this system?
   A. 0111010000 000011
   B. 1000110000 000011
   C. 1000101111 000011
   D. None of the above
2. What is the denary value of the given binary floating-point number **1011000111 000111**?
   A. 177.75
   B. –177.75
   C. –78.25
   D. None of the above
3. The given binary floating-point number, **0000000111 100111,** is not normalized. Which of the following is a normalized format of this number in this system?
   A. 0111000000 000110
   B. 0111000000 100001
   C. 0111000000 100000
   D. None of the above
4. What is the Boolean expression for the output X of the logic circuit below?
   A. $\overline{A.B.\overline{C}} + A.B.\overline{C} + A.B.C$
   B. $\overline{A}.\overline{B}.\overline{C} + A.B.C + A.\overline{B}.C$
   C. $\overline{A}.B + A.B.\overline{C}$
   D. $A.B + A.\overline{C}$



5. A disk has two recordable sides, 18 tracks and 80 sectors per track. If each sector stores 512 bytes of data. The capacity of the disk in megabytes and the minimum number of bits required to specify a particular sector in the disk are respectively?
   A. 0.70 MB, 12 Bits
   B. 1.41 MB, 12 Bits
   C. 1440 MB, 2880 Bits
   D. 0.70 MB, 2880 Bits
6. Which registers interface the processor with the main memory?
   A. Program counter and Accumulator
   B. Memory address register and Memory data register
   C. Current instruction register and accumulator
   D. Current instruction register and program counter.
7. The following are three statements about the "locality of reference" principle used in memory systems:
   I. It states that it is more likely that an already accessed memory location is accessed further and it is more likely that surrounding (adjacent) memory locations will also be accessed
   II. It is an observation that is widely used to implement virtual memory and cache memory systems
   III. It states that the bytes of a word be interleaved on several physical memory modules for better performance

   Which of them is/are true?
   A. Only I is true
   B. Only II is true
   C. Only III is true
   D. Only I and II are true
8. Consider the following processor design characteristics:
   I: Register-to-register arithmetic operations only II: Fixed-length instruction format III: Hardwired control unit.
   Which of the characteristics above are used in the design of a RISC processor?
   A. I and II only
   B. II and III only
   C. I and III only
   D. I, II and III
9. For computers based on three-address instruction formats, each address field can be used to specify which of the following? S1: A memory operand, S2: A processor register, S3: An implied accumulator register
   A. Either S1 or S2
   B. Either S2 or S3
   C. Only S2 and S3
   D. All of S1, S2 and S3

10. A processor can support a maximum memory of 4GB, where the memory is word-addressable (a word consists of two bytes). What is the minimum size of the address bus of the processor?
    A. 30
    B. 31
    C. 32
    D. 64
11. What is the largest base-10 integer that can be represented with a two-digit hexadecimal number?
    A. 32
    B. 225
    C. 255
    D. 256
12. Pipelining improves CPU performance due to:
    A. Reduced memory access time
    B. Increased clock speed
    C. The introduction of parallelism
    D. Provision of additional functional units
13. 11001, 1001 and 111001 correspond to the 2's complement representation of the following set of numbers
    A. 25, 9 and 57 respectively
    B. -6, -6 and -6 respectively
    C. -7, -7 and -7 respectively
    D. -25, -9 and -57 respectively
14. A CPU has a 16-bit program counter. This means that the CPU can address
    A. 16K memory locations
    B. 32K memory locations
    C. 64K memory locations
    D. 256K memory locations
15. A CPU has 24-bit instructions. A program starts at address 300 (in decimal) and memory is byte addressable. Which one of the following is a legal program counter (all values in decimal)?
    A. 400
    B. 500
    C. 600
    D. 700
16. Match List-I with List-II using the memory hierarchy from top to bottom.

List-I	List-II
I. Size	1. Increases
II. Cost per bit	2. Decreases
III. Access time	3. No change

    A. I-1, II-1, III-2
    B. I-2, II-3, III-2
    C. I-1, II-2, III-1
    D. I-3, II-1, III-1
17. What is the role of the address resolution protocol?
    A. It is used for mapping the IP address from the DNS
    B. It is used for mapping the IP address of the default gateway
    C. It is used for mapping an IP address to its corresponding MAC address
    D. It is used for finding the IP address that corresponds to an IP address
18. Consider the different activities related to email:
    m_1 : Send an email from a mail client to a mail server
    m_2 : Download an email from mailbox server to a mail client
    m_3 : Checking email in a web browser.
    What is the application-level protocol used in each activity?
    A. m_1: HTTP m_2 : SMTP m_3 : POP3
    B. m_1 : SMTP m_2 : FTP m_3 : HTTP
    C. m_1 : SMTP m_2 : POP3 m_3 : HTTP
    D. m_1 : POP3 m_2 : SMTP m_3 : IMAP
19. Which system uses feedback mechanisms to regulate or optimize system behaviour?
    A. Monitoring systems
    B. Control systems
    C. Monitoring and control systems
    D. None of the above
20. Which of the following is a characteristic of vector graphics?
    A. Resolution-dependent
    B. Pixelated when scaled
    C. Lossy compression
    D. Scalable without loss of quality

21. Which of the following is a suitable type of operating system for: A computer system dedicated to controlling the guidance system of a cruise missile?
    A. Batch operating system
    B. Real time operating system
    C. Network operating system
    D. Closed source operating system
22. Consider the following performance table for FCFS scheduling. Determine the throughput for these batch of processes:
    A. 5.2
    B. 0.192
    C. 0.172
    D. 5.8

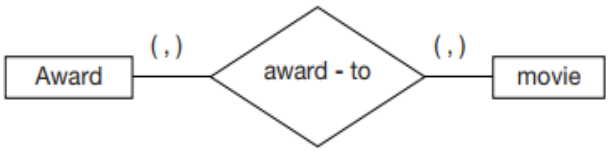
Position in the batch	Job arrival time (Ai)	Job Completion time (Ci)
1	3	8
2	8	10
3	10	16
4	12	18
5	15	29

23. Consider six memory partitions of sizes 200KB, 400KB, 600KB, 500KB, 300KB and 250KB. These partitions need to be allocated to four processes of sizes 357KB, 210KB, 468KB and 491KB in that order. If the best fit algorithm is used, which partitions are NOT allocated to any process?
    A. 200KB and 300KB
    B. 200KB and 250KB
    C. 250KB and 300KB
    D. 300KB and 400KB
24. For the processes listed in the following table, which of the following scheduling schemes will give the lowest average turnaround time?

Process	Arrival Time	Burst Time
A	0	3
B	1	6
C	4	4
D	6	2

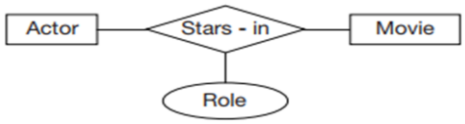
    A. First Come First Serve
    B. Non-Preemptive Shortest Job First
    C. Shortest Remaining Time First
    D. Round Robin with Quantum value two
25. In a resource allocation graph, some resources have more than one instance, then a cycle means:
    A. Deadlock exists
    B. Deadlock may exist
    C. Deadlock can be avoided
    D. Deadlock can be recovered
26. The process of trying to predict what will happen in a real-life situation from a model of that situation is called
    A. Modeling
    B. Monitoring
    C. Simulation
    D. Prototyping
27. Which of the following type of software is not system software?
    A. Assemblers
    B. Interpreters
    C. Utility programs
    D. Image editors
28. The highest bandwidth is provided by which of the following media?
    A. Coaxial cables
    B. Optical fiber
    C. Microwave
    D. Satellites
29. Which of the following is NOT a super key in a relational schema with attributes V, W, X, Y, Z and primary key V Y?
    A. VXYZ
    B. VWXZ
    C. VWXY
    D. VWXYZ
30. Consider the given Relation schema: **Student** (RNo: integer, Sname: string, login: string, age: integer, grade: char(1), parent-name: string, percentage: Real). What is the "**Arity**" of given Relation schema?
    A. 2, 3, 1, 1
    B. 7
    C. 3, 4
    D. 6
31. Which of the following specifies "Cardinality" of a Relation?
    A. The number of fields in a Relation
    B. The number of columns in a Relation
    C. The number of Tuples in a Relation
    D. Both (A) and (C)

32. A movie award goes exactly to one movie. A movie may be awarded multiple awards (but may be none at all). Which of the following is correct cardinality ratio, for the above description?



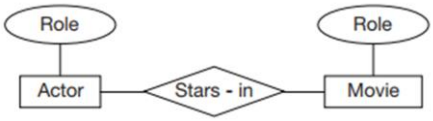
A. (0, 1), (1, n)
B. (1, 1), (1, n)
C. (1, 1), (0, *)
D. (1, 1), (1, *)

33. Which of the following model, describes the fact that a role is stored for every pair of actor 'X' and movie 'Y' such that 'X' starred in 'Y'

A.


B.


C.


D


34. The following numbers are inserted into an empty binary search tree in the given order: 10, 1, 3, 5, 15, 12, 16. What is the height of the binary search tree?
A. 2
B. 3
C. 4
D. 6

35. Consider a hash table of size seven, with starting index zero, and a hash function $(\mathbf{3x + 4}) \bmod \mathbf{7}$. Assuming the hash table is initially empty, which of the following is the contents of the table when the sequence 1, 3, 8, 10 is inserted into the table using closed hashing? Note that - denotes an empty location in the table.
A. 8, 3 , - , 1 , - , - , 10
B. 1, 8, 10, - , - , - , 3
C. 1, 10 , - , - , 8 , - , 3
D. 1, 10, 8, - , - , - , 3

36. Match the following:

I-Waterfall Model	a) Specifications can be developed incrementally
II-Evolutionary Model	b) Explicit recognition of risk
III-Spiral Model	c) Inflexible partitioning of the project into stages

A. I-a), II-c), III-b)
B. I-b), II-a), III-c)
C. I-c), II-a), III-b)
D. I-b), II-c), III-a)

37. Testing of software with actual data and in actual environment is called
A. Alpha testing
B. Beta testing
C. Regression testing
D. None of the above

38. A non-linear collection of data elements where its elements are accessed by means of pointers is called?
A. Linked list
B. 1-D array
C. Record
D. Binary trees

39. Which of the following concerning records is true for the statement:
NurseryLand.Nursery.Students = 10;
A. The structure Students is nested within the structure Nursery.
B. The structure NurseryLand is nested within the structure Nursery.
C. The structure Nursery is nested within the structure NurseryLand.
D. The structure Nursery is nested within the structure Students.

40. A computer program contains the following fragment:

```
Boolean: LY
Integer: Y
LY :=  (Y mod 4 = 0)  AND ( NOT (Y mod 100 = 0) OR
       (Y mod 400 = 0))
```

What value would be assigned to the variable LY, if the
variable Y contains 1999?

A. TRUE
B. 5
C. 2
D. FALSE

41. One of the following is NOT true about high level languages:

A. They are relatively easier to learn
B. Programs are platform independent
C. Execution of code is faster
D. It is easier and faster to write programs

42. Analysis which determines the meaning of a statement once its grammatical structure is correct is known as:

A. Syntactical analysis
B. Semantic analysis
C. Grammatical analysis
D. Lexical analysis

43. Given the function $fuf_2(n) = 1 \times 2 \times 3 \times \ldots\ldots n$ $f(n) = n!$, n a natural number and defined either as in
or $f_1(n) = n(n-1)!$ with $0! = 1$

A. $f_1(n)$ is the iterative version of the factorial function
B. $f_1(n)$ executes with no internal slack while $f_2(n)$ does
C. $f_1(n)$ and $f_2(n)$ will have the same runtime efficiency
D. $f_2(n)$ is more efficient than $f_1(n)$

44. Which loop construct is best suited for situations where the loop body must always be executed at least once?

A. for loop
B. while loop
C. do-while loop
D. if-else loop

45. Which one of the problems listed below is intractable?

A. The travelling salesman problem
B. The problem of sorting a list of names into alphabetic order
C. The Halting problem
D. Searching an array, A of n elements

46. Which of the following statements about the complexity class NP is true?

A. NP stands for Non-Polynomial
B. NP includes all problems that can be solved in polynomial time by a deterministic Turing machine
C. NP includes all problems whose solutions can be verified in polynomial time by a deterministic Turing machine
D. NP is a subset of P

47. Compilation of a program occurs in stages. Which of the following lists is a correct ordering of the stages:

A. Syntax analysis, lexical analysis, semantic analysis, code generation
B. Syntax analysis, semantic analysis, lexical analysis, code generation
C. Semantic analysis, syntax analysis, lexical analysis, code generation
D. Lexical analysis, syntax analysis, semantic analysis, code generation

48. Insertion sort is applied on a given sequence: 89, 45, 68, 90, 29, 34, 17. What is the sequence after 2 passes?

A. 17, 29, 68, 90, 45, 34, 89
B. 17, 29, 68, 90, 34, 45, 89
C. 45, 68, 89, 90, 29, 34, 17
D. 45, 68, 29, 34, 17, 89, 90

49. Consider the algorithm below. Determine the output for N=139 and L=3

```
D := N div L
Z := 1
B := false
WHILE (Z<L) DO
    D := D div L
    Z := Z+1
    B := NOT B
ENDWHILE
IF (D ≠ 0 AND B) THEN
    Output(D, B)
ELSE
    Output(Z, NOT B)
ENDIF
```

A. 46, true
B. 3, true
C. 46, false
D. None of the above

50. Consider the algorithm below. Determine the output for N=6

```
SUM := 0
FOR (COUNT ←1 to (N div 2)) DO
    IF (N mod COUNT = 0) THEN
        SUM := SUM + COUNT
    ENDIF
ENDFOR
IF(SUM = N) THEN
    Output ("Perfect")
ELSE
    Output ("Not perfect")
ENDIF
```

A. Not perfect
B. Perfect
C. The pseudocode has runtime errors
D. The pseudocode has compile time errors

END

STOP!
GO BACK AND CHECK YOUR WORK.