SOUTH WEST REGIONAL MOCK EXAMINATION
GENERAL EDUCATION

The Teachers' Resource Unit (TRU) in collaboration with the Regional Pedagogic Inspectorates and the Subject Teachers' Association (STA)	Subject Code 0795	Paper Number 1
CANDIDATE NAME ..... CANDIDATE NUMBER ..... CENTRE NUMBER	Subject Title COMPUTER SCIENCE	
ADVANCED LEVEL	DATE 04/04/2022 (MORNING)	

Time Allowed: One hour thirty minutes

INSTRUCTIONS TO CANDIDATES:

1. USE A SOFT HB PENCIL THROUGHOUT THIS 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, Paper 1**".
4. Insert the information required in the spaces provided above.
5. Without opening the booklet, pull out the answer sheet carefully from inside the front cover of this booklet. 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.
6. Insert the information required in the spaces provided on the answer sheet using your HB pencil:
   Candidate Name, Centre Number, Candidate Number, Subject Code Number and Paper Number.

How to answer questions in this examination:

7. Answer ALL the 50 questions in this examination. All questions carry equal marks.
8. Non-programmable calculators are allowed.
9. For each question there are four suggested answers, A, B, C, and D. Decide 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 C is your correct answer, mark C as shown below:

[A] [B] [C] [D]

10. Mark only one answer for each question. If you mark more than one answer, you will score zero for that question. If you change your mind about an answer, erase the first mark carefully, and then mark your new answer.
11. Avoid spending much time on any question. If you find a question difficult, move to the next question. You can come back to this question later.
12. Do all rough work in this booklet using, where necessary, the blank spaces in the question booklet.
13. Mobile phones are **NOT ALLOWED** in the examination room.
14. You must not take this booklet and answer sheet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination.

1. The maximum capacity of memory a computer can use is determined by the size of
   A Control bus
   B Data bus
   C Address bus
   D PCI bus

2. Which addressing mode executes its instruction within the CPU without the need to reference memory for operands?
   A Relative mode
   B Register mode
   C Direct Mode
   D Immediate Mode

3. A CPU scheduling algorithm determines an order for the execution of its scheduled processes. Given k processes to be scheduled in one processor, how many different possible ways can these processes be scheduled?
   A k!
   B (k-1)!
   C k!/(k-1)!
   D k(k-1)/2

4. In Structured Query Language, the commands SELECT, INSERT and UPDATE can be classified as __
   A TCL commands
   B DCL commands
   C DDL commands
   D DML commands

5. A situation that exists between two tables in a relational database when one table has a foreign key that references the primary key of the other table is known as:
   A Aggregation
   B Normalisation
   C Relationship
   D Inheritance

6. Which Boolean identity is described by the equation A·(B + C) = A·B + A·C?
   A Commutative law
   B Distributive law
   C Associative law
   D Idempotent law

7. When content is multicast in a local area network, it is received by:
   A The server only
   B The requesting device only
   C Some devices in the network
   D All the devices in the network

8. Which of the following describes the difference between a hub and a switch in data communication?
   A A hub transmits only analog signals while a switch transmits both analog and digital signals.
   B A hub operates on the data link layer of the OSI reference model while a switch operates on the physical layer.
   C All ports on a hub are in the same collision domain while every port on a switch is in a separate collision domain.
   D All ports on a hub are in the same broadcast domain while every port on a switch is in a separate broadcast domain.

9. Which of the following registers holds the address of the instruction to be executed next?
   A Status register
   B Instruction register
   C Memory address register
   D Program counter

10. One way of dealing with deadlocks is to ensure that the request for any resource is only granted if the resulting state of the system does not cause a deadlock. This method of dealing with deadlocks is known as:
    A Deadlock prevention
    B Deadlock avoidance
    C Deadlock detection
    D Mutual exclusion

11. Consider that n elements are to be sorted. What is the worst case time complexity of Bubble sort?
    A O(1)
    B O(logn)
    C O(n)
    D $O(n^2)$

12. To which of the following do internal nodes in a binary expression tree correspond?
    A Operands.
    B Operators.
    C Both operators and operands.
    D Pointers.

13. An ASCII character is said to be coded in one byte. How many bits are needed to code the word within quotes "CGCEB"?
    A 42.
    B 6.
    C 40.
    D 68.

14. In which phase of the system development process is documentation aimed at determining what the system must do?
A Analysis
B Design
C Investigation
D Construction

15. Which of the following is a testing technique which is used to demonstrate that each program function is operational?
A System testing
B Unit testing
C Whitebox testing
D Blackbox testing

16. Which of the following bitwise Boolean functions can be used to find the two's complement of a number?
A Bitwise OR
B Bitwise NOT
C Bitwise AND
D Bitwise XOR

17. Which of the following devices is best suited for converting computer generated signals into a form that is suitable for transmission on a telephone line?
A Modem
B Router
C Multiplexer
D Network adapter

18. In a binary search tree, the in-order successor of a given node *n* is the node with:
A Minimum value in the right subtree of n
B Minimum value in the left subtree of n
C Maximum value in the right subtree of n
D Maximum value in the left subtree of n

19. Which of the following is a data transmission method where many channels are used at the same time; achieved by using a range of frequencies?
A Parallel transmission
B Synchronous transmission
C Baseband transmission
D Broadband transmission

20. The number of address lines required to address a memory of 256K is:
A 15 lines
B 16 lines
C 18 lines
D 14 lines

21. A piece of software, possibly incomplete, that is meant to facilitate agreement on system specifications between software producer and customer is:
A User interface.
B System prototype.
C System model.
D Pseudo code

22. If a new device, such as a printer or scanner, is attached to a computer, which software needs to be installed before the device can function properly?
A Patch
B Driver
C Compiler
D Device controller

23. What is the number of comparisons that will be done for a binary search in a sorted array of *n* elements if the element sought is **NOT** in the list?
A n
B $n/2$
C $\log n$
D $1 + \log n$

24. Which of the following is not caused by the execution of a return instruction from a routine?
A Transfer control to the caller routine.
B Load the PC with a popped value from the stack.
C Resume program execution from the point where branching occurred.
D CPU saves the return address on the top of a stack.

25. What is the smallest number that can be represented in 8-bit two's complement?
A 01111111
B 11000000
C 10000000
D 11000001

26. When implementing a database, creating a one-to-many relationship between two tables can be done by adding the primary key of one table into the related table as a(n) _____
A Composite key
B Foreign key
C Candidate key
D Alternate key

27. The type of programming language that associates data and operation together is known as:
A Procedural
B Logic
C Functional
D Object-oriented

28. Which of the following is used in a computer network to determine which application a transmission should be delivered to, on a particular computer?
A Port number
B Protocol
C Domain name
D IP address

29. What is the result of the postfix expression 3 10 5 + *?
A 35
B 53
C 45
D 65

30. The collection of related data elements possibly of different types stored as a single unit is a(n):
A Record
B Array
C List
D Tree

31. The SUM output of a half adder is obtained by which of the following gates?
A AND
B OR
C XOR
D NAND

32. When an IF statement is used within another IF statement this is called:
A Assignment
B Nesting
C Selection
D Looping

33. A character set uses 7 bits to encode each character. What is the maximum number of characters that can be represented in this character set?
A 56 characters
B 49 characters
C 128 characters
D Any number of characters

34. What is the purpose of a PS/2 port on a computer?
A To connect a monitor to the computer
B To connect a printer to the computer
C To connect a projector to the computer
D To connect a keyboard to the computer

35. Which of the following is not a function of RAM in a computer?
A It holds programs and data that are in current use by the processor
B It holds data that has been processed and waiting to be sent to a storage device
C It holds frequently requested data for quick access by the CPU
D It holds the boot or start-up program which is run when the computer is switched on

36. Parity bits are used for which of the following purposes?
A Error detection
B Error correction
C Faster transmission
D Synchronisation.

37. If a magnetic disk contains 4 tracks of 16 sectors per side, and each sector can hold 8 bytes of data, what is the exact capacity of the disk in kilobytes?
A 0.5KB
B 1.4KB
C 1KB
D 2KB

38. A bus feature that facilitates the discovery of a hardware component in a system without the need for physical device configuration is known as:
A Pairing
B Compatibility
C Connectivity
D Plug n play

39. One address instruction formats are characteristic to which of the following CPU organisations?
A RISC
B CISC
C Load/Store
D Accumulator

40. The memory Unit which communicates directly with the CPU is called the:
A Direct memory
B Virtual memory
C Main memory
D Auxiliary memory

41. When higher versions of an operating system are written so that programs designed for earlier versions can still be run, this is known as:
A Portability
B Upgradability
C Interoperability
D Compatibility

42. When a page fault occurs in memory management and there is no free frame, a page needs to be evicted in order to create space. Which of the following is true about the page which is selected for eviction if the LRU replacement policy is used?
A The selected page must not be a dirty page.
B The selected page must be the first to arrive in memory.
C The selected page must have not been used for the longest time in the past.
D The selected page must have the least count of number of times used.

43. Given a full binary tree with $2n + 1$ nodes, where n is the number of nodes, this binary tree contains:
A n leave nodes
B n non-leaf nodes
C $n - 1$ leaf nodes
D $n - 1$ non-leaf nodes

44. Which of the following provides an interface between a user process and the operating system?
A Kernel
B Interrupts
C System Calls
D Scheduling algorithm

45. A variable which is visible only in the function in which it is defined is called:
A Actual parameter
B Formal parameter
C Global variable
D Local variable

46. The next binary number in the sequence 0000, 0001, 0001, 0010, 0011, 0101 is:
A 1000
B 1010
C 0100
D 0111

47. When the primary key of a relation is a determinant for another attribute, which in turn is a determinant for a third attribute this situation is called:
A Multi-level dependency
B Transitive dependency
C Partial dependency
D Multi-valued dependency

48. Which of the following is NOT TRUE about queue data structures?
A They are also called FIFO lists
B They store data in a linear fashion
C Items are inserted at the tail and removed from the head
D They can be used to evaluate arithmetic expressions

49. Which of the following correspond to the three criteria which any solution to the critical section problem must satisfy?
A Request, use and release
B Entry section, critical section, and exit section
C Mutual exclusion, progress, and bounded waiting
D Mutual exclusion, no pre-emption, and circular-wait

50. Consider the pseudocode fragment below where % is the modulo arithmetic operator.

```
For k ← 0 To N-1 Step 2
  If k % 3 = 1 Then
    Print(k)
  EndIf
Next k
```

For N = 20, what is the expected output of the pseudocode fragment above?
A 4, 0 10, 16
B 0, 6, 12, 18
C 1, 4, 7, 10, 13, 16, 19
D 0, 2, 4, 6, 8, 10, 12, 14, 16, 18

STOP

GO BACK AND CHECK YOUR WORK