GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

0795 COMPUTER SCIENCE 1

JUNE 2022 **ADVANCED LEVEL**

Centre Number	
Centre Name	
Candidate Number	
Candidate Name	

Mobile phones are NOT allowed in the examination room

MULTIPLE CHOICE QUESTION PAPER

One and a Half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions 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 the information required in the spaces provided on the answer sheet using your HB pencil:
   Candidate Name, Exam Session, Subject Code 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 instruction.

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 **C** is your correct answer, mark **C** 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, 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. Do all rough work in this booklet, using the blank spaces in the question booklet.
11. **At the end of the examination, the invigilator shall collect the answer sheet first and the question booklet. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**

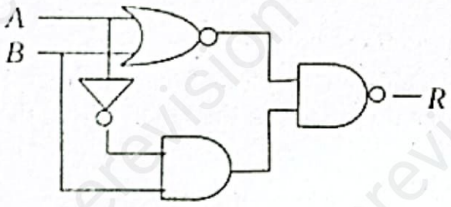
1. Alternative sets of instructions could be used to solve a given problem. To do so quickly, in which of the following classes of machines should you select your machine?
   A Single-instruction, single-data.
   B Single-instruction, multiple-data.
   C Multiple-instruction, single-data.
   D Multiple-instruction, multiple-data.

2. Paul wanted his job to be done on machines when they are available, and to use hardware he could not afford to buy. It was best he works on a:
   A Workstation Computer.
   B Distributed Computer.
   C Mini Computer.
   D Parallel Computer.

3. It is used to provisionally hold bulky data to and from an executing program, for immediate use or for other processes. It is a:
   A Hard drive.
   B Main memory.
   C Cache memory.
   D USB drives.

4. What is the result of the following in one's complement notation?
   01 110 101 – 01 001 100.
   A 00 101 001.
   B 00 101 000.
   C 10 101 001.
   D 10 011 000.

5. What is R in the following circuit diagram?



   A $\overline{\bar{A} \cdot B \cdot (\overline{A + B})}$.
   B $\overline{A \cdot \bar{B} \cdot (A + B)}$.
   C $\overline{\bar{A} + B + \bar{A} \cdot B}$.
   D $\overline{A \cdot B + \bar{A} \cdot \bar{B}}$.

6. Which of the following corresponds to the truth table adjacent?
   A $\bar{A} \cdot \bar{B} + \overline{A \cdot B}$.
   B $A \cdot \overline{B + A} \cdot B$.
   C $\bar{A} \cdot B + A \cdot B$.
   D $\overline{A \cdot B + \overline{A \cdot B}}$.

A	B	R
F	F	F
F	T	T
T	F	F
T	T	T

7. Which of the following must be encoded in a machine's instruction code?
   A The operation to execute.
   B The values to use in operations.
   C The destination where to keep results.
   D The next operation to carry out.

8. A machine's CPU takes arguments for its binary operations from a stack. Surely it is a:
   A Three-address machine.
   B Two-address machine.
   C One-address machine.
   D Zero-address machine.

9. In **immediate** mode addressing of machines:
   A The operand of the instruction is used immediately.
   B The operand value is given as part of the instruction.
   C The operand field holds an address for its immediate use.
   D The operand address is given as part of the instruction.

10. It is said to exploit creativity to satisfy expert users to manage scenarios for profitable outcomes, which could also be recreational. It must be:
    A Computer Games.
    B Computer Aided Design.
    C Information Systems.
    D Software Systems.

11. It is good at repetitive tasks, organises information for senior management to act on, typically using data from routine daily information. It must be:
    A A robot.
    B An intelligent machine.
    C A Business information system.
    D Executive information system.

12. We use them to make sure our loved ones are okay, to get information from various parts of the world, and even to track information in organisations.
A Management Information Systems.
B Information & Communication Systems.
C Geographic Information Systems.
D Health Information Systems.

13. In handling data, which of the following is a breach of privacy?
A Let Zia verify data he must have input.
B Transfer computer data to your phone.
C The taxi driver makes public Bih's medical record she forget in a taxi.
D Idi makes public his own medical record.

14. Which of the following is a computer threat that affects network availability to authorised users?
A Flood a website with service requests.
B Illegal change to someone's password.
C Corruption of a file system in a network.
D Spoofing where data is sent in a network.

15. In the early days of computing, operating systems evolved in the following order:
A Multi-tasking, multi-user, online.
B Multi-user, real-time, online.
C Batch, multi-tasking, multi-user.
D Batch, multi-user, real-time.

16. Spatial databases record:
A Objects and their relationships as they are laid out in some space, like on earth.
B Objects and their relationships at fixed positions on the surface of the earth.
C Record changing values and relationships at fixed positions on earth.
D Record the values of objects as their relationships change on earth.

17. Some types of software must be used whenever we use a machine, and so set up the environment in which to carry out machine as well as end-user tasks. They are:
A Application programs.
B Systems programs.
C Library programs.
D Utility programs.

18. Which of the following compiler phases best ensure that program instruction components are correctly put together.
A Lexical analysis and syntax analysis.
B Syntax analysis and code generation
C Code generation and code optimisation.
D Code optimisation and code execution.

19. Joe an occasional user of his machine, avoids technical details and works mostly on his programs. Jill manages the technical details of servers for many people, and often scripts specialised commands. It is best for Joe and Jil to respectively use:
A MS Windows GUI; Linux CLI.
B MS Windows GUI; MS Windows GUI.
C Linux CLI; MS Windows GUI.
D Linux CLI; Linux CLI.

20. How does demand-paged memory allocation differ from paged and segmented allocations?
A Executing pages are in main memory.
B Page sizes contain program segments.
C Data is stored in equal-sized pages in main memory.
D A page fault brings missing pages to main memory.

21. Suppose Jobs J1, J2 and J3 require 8, 5 and 2 units of time respectively to execute and a First-come First-served scheduling policy is used. In which order should they arrive in order to ensur the smallest total wait time.
A J2, J3, J1.
B J2, J1, J3.
C J3, J1, J2.
D J3, J2, J1.

22. Which of the following cannot be guaranteed b normalisation?
A Ensure foreign keys are wholly null.
B Eliminate partially dependent attributes.
C Deny incomplete data items entered.
D Avoid multiple updates to an attribute.

23. In relational databases which of the following i NOT true?
A Only candidate keys uniquely identify data items found in a relation.
B Use partially null foreign keys in normalised databases.
C Introduce foreign keys in order to normalise a database.
D Candidate keys can be null in a relation.

24. In relation to database integrity, data consistency means the data:
A Entered is correct.
B Entered is secure.
C Stored adheres to data constraints.
D Stored adheres to database standards.

25. Which of the following is most conveniently used to describe how data will eventually be treated in executing program units?
A UML charts.
B Flow charts.
C Dataflow diagrams.
D E-R diagrams.

26. Given the use of computers by employees, which least requires human intervention at the workplace?
A Office automation.
B Job retraining.
C Decision support systems.
D Management information systems.

27. It encodes data from channels to transmit over possibly very long distances, before restoring to respective channels:
A Multiplexer.
B Repeater.
C Modem.
D Codec.

28. Ngongsu at Branch Office has to research on a critical project and so must readily get information from organisations she trust. However, she must confidentially communicate her findings to Zoe at Head Office. Overall, they are better off using:
A Internet.
B Intranet.
C Extranet.
D Ethernet.

29. Data from one computer was getting too fast to another, and sometimes too slowly. To harness this problem, Nchang thought the data sent must be:
A Signalled.
B Buffered.
C Synchronised.
D Coordinated.

30. In relation to database access which of the following is correct?
A Authorisation grants people the right to access data in a database.
B Authentication grants people the right to know who has accessed a database.
C Journaling keeps record and blocks illegal accesses to a database.
D Enforcement of standards ensures fair use of the database by everyone.

31. For a certain database, the box adjacent shows <u>for each row</u> attributes in the left column (A) on which those in the right column (B) depend.. Which sets of relations are in 3rd Normal Form and use all the dependencies, if key attributes are underlined?

Attributes	
A	B
u	*v, w, t.*
w	*x, y.*
z	*x.*

A **D**($\underline{u}$, *v*, *t*, $\underline{w}$, *x*, *y*, $\underline{z}$).
B **D1**($\underline{u}$, *v*, *w*, *t*); **D2**($\underline{w}$, *x*, *y*); **D3**($\underline{z}$, *x*).
C **D1**($\underline{u}$, *v*, *w*, *t*); **D2**($\underline{w}$, *y*); **D3**($\underline{w}$, $\underline{z}$, *x*).
D **D1**($\underline{u}$, *v*, *t*); **D2**($\underline{w}$, *y*); **D3**($\underline{w}$, $\underline{z}$, *x*).

32. Assuming identifier names are of obvious meanings, the SQL query: SELECT dish FROM menu WHERE hotelStars >= 3 AND town = 'Moh'.
A Identifies all dishes found in the menus of at least 3 Star hotels in Moh town.
B Selects from the file 'menu' all entries having 'Moh' and at least 3 hotelStars.
C List menu dishes in 3 Star hotels found in Moh town.
D Identifies some dishes found in 3 Star hotels found in Moh town.

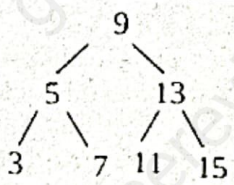
33. In the relation **R** below each student has a unique ID and email address, a non-unique student name, and letter grades for courses (cseID) he/she took. Which set of relations is equivalent to **R** in third normal form (3NF), if key attributes are underlined?

R

stuID	*name*	*Email*	*cseID*	*grade*
171	Moki	mly@fx.uk	CSC301	B
171	Moki	mly@fx.uk	CSC401	C
260	Kang	ksi@fx.uk	HIS316	A
350	Liz	ltj@fx.uk	HIS210	D
350	Liz	ltj@fx.uk	HIS260	B

A **R1**(*stuID*, *name*), **R2**(*stuID*, *email*), **R3**(*email*, *cseID*, *grade*).
B **R1**(*studID*, *cseID*, *name*), **R2**(*cseID*, *email*), **R3**(*email*, *grade*)
C **R1**(*stuID*, *cseID*, *email*), **R2**(*cseID*, *grade*, *name*).
D **R1**(*stuID*, *email*, *name*), **R2**(*email*, *cseID*, *grade*).

34. In order to print the nodes of the tree beside in ascending numerical order, how should it be traversed?



A Pre order.
B In order.
C Post order.
D Mixed order.

35. Which data type always requires an index to access it?
A Integer.
B Real.
C Array.
D Record.

36. What input device might a multi-choice questionnaire writer use to input completed forms into a computer?
A Magnetic Ink Character Recognition (MICR).
B Optical Mark Recognition (OMR).
C Optical Character Reader (OCR).
D Hand Held Computers.

37. Joe develops a software application from identified subtasks that have mostly been implemented. He only needs to work out how best to combine them into a working solution. The best design strategy to use is:
A Subtask design.
B Functional design.
C Top-down design.
D Bottom-up design.

38. What is the value of p at the end of the algorithm adjacent?
A -8.
B 12.
C 16.
D 20.

```
p ← 8;
q ← 2;
while p>=q do
  q ← q+2;
  p ← p-3;
endwhile
p ← p*q;
```

39. Programming Language (PL) fucntions are designed to return a value. The values returned by PL functions or procedures are returned:
A As output.
B As parameter.
C By value.
D By reference.

40. Semantics of a language describes how:
A Its words can be correctly put together.
B Its words can be correctly given meaning.
C Its correctly combined words can be given meaning.
D Its symbols can be correctly combined in a meaningful way.

41. Meh is to set up an environment for students to learn on a given software application. He has to make sure the software runs as expected. It is best Meh consults its:
A Tutorial Guide.
B User Manual.
C Installation Manual.
D Test Plan.

42. Which of the following is strictly speaking NOT part of debugging?
A Breakpoints.
B Watchpoints.
C Tracing.
D Testing.

43. Waterfall model is not suitable for:
A Small projects
B Complex projects
C Accommodating changes
D Maintenance projects

44. Which of the following sorting algorithms is of divide-and-conquer type?
A Bubble sort.
B Insertion sort.
C Quick sort
D Algorithm.

45. It helps the software developers' understanding of what the user wants, some challenges to resolve, and the kind of software delivery to expect. The activity must be:
A Software analysis.
B Software design.
C Software specification.
D Software implementation.

46. Nde implemented sent messages within a program by storing data in memory and stating the order in which instructions are executed. For this task, he surely used a(n):
A Imperative programming paradigm.
B Message programming paradigm.
C Logic programming paradigm.
D Object-oriented programming paradigm.

47. Which of the following is a functional requirement?
A Maintainability.
B Portability.
C Business needs.
D Reliability.

48. Which of the following is true about software Verification?
A Ensures the product being developed is according to design specifications.
B Concentrates on the design and system specifications.
C Both A and B.
D None of the above.

49. A function f is defined as follows:

$$f(a,b) = \begin{cases} 0 & if\ b = 0 \\ a + f(a, b-1) & if\ b > 0 \\ a + f(a, b+1) & otherwise \end{cases}$$

What is the value of f(-3, -3)?
A 6.
B -9.
C -3.
D -6.

50. We examine a program to make sure each of its components obtains the correct behaviour from all the other components. It must be:
A Black box testing.
B White box testing.
C Unit testing.
D Integration testing.

GO BACK AND CHECK YOUR WORK