## CISSE FOUNDATION LEVEL

## COMPUTING SYSTEMS

**MONDAY: 2 December 2024. Morning Paper.**                              **Time Allowed: 2 hours.**

**This paper consists of fifty (50) Multiple Choice Questions. Answer ALL questions by indicating the letter (A, B, C or D) that represents the correct answer. Each question is allocated two (2) marks.**

1.  Which one of the following statements **BEST** describes the relationship between hardware and software?
    A.   Hardware and software are unrelated components of a computer system
    B.   Software controls and directs hardware to perform tasks
    C.   Hardware performs all tasks without the need for software
    D.   Software is used to repair hardware issues                                     (2 marks)

2.  The purpose of the Basic Input/Output System (BIOS) in a computer system is to _____.
    A.   manage system memory
    B.   provide a user interface for applications
    C.   initialise and test hardware components during startup
    D.   compile source code                                                         (2 marks)

3.  Which one of the following methods of data processing is **BEST** suited for scenarios requiring continuous, uninterrupted processing and updating of data?
    A.   Batch processing
    B.   Real-time processing
    C.   Sequential processing
    D.   Offline processing                                                          (2 marks)

4.  Which one of the following is **TRUE** about off-the-shelf software?
    A.   It is customised to meet the unique user needs
    B.   Requires user training before implementation
    C.   Lacks when it comes to scalability as the software is already made and published to the market
    D.   All the operating systems and devices are able to support this software      (2 marks)

5.  Which one of the following is a type of computer file that stores critical data for running the organisation?
    A.   Movement file
    B.   Sort file
    C.   Archive file
    D.   Master file                                                                 (2 marks)

6. Which one of following network components will convert digital data from a computer to an analogue signal for transmission over telephone lines?
   A. Hub
   B. Modem
   C. Router
   D. Multiplexer (2 marks)

7. Which one of the following is an advantage of fibre optic cables over traditional copper cables?
   A. Lower cost
   B. Higher bandwidth
   C. Simplicity of installation
   D. Flexibility (2 marks)

8. The primary purpose of an IP address in a computer network is to _____.
   A. identify the type of network
   B. uniquely identify a device on a network
   C. encrypt network traffic
   D. configure network hardware (2 marks)

9. Which one of the following types of network media uses electrical signals to transmit data over copper cables?
   A. Fiber optic cables
   B. Coaxial cables
   C. Twisted pair cables
   D. Network cable (2 marks)

10. Which one of the following statements is an example of a transaction processed by a transaction processing system (TPS)?
    A. Generating a monthly sales report
    B. Designing a new product line
    C. Conducting market research
    D. Processing a customer's purchase at a retail store (2 marks)

11. The main purpose of an electronic payment gateway in e-commerce is to _____.
    A. manage inventory levels
    B. encrypt and process online payment transactions securely
    C. handle customer service inquiries
    D. design marketing campaigns (2 marks)

12. Which one of the following statements is a common ethical concern regarding data privacy in Information Communication Technology ICT?
    A. Ensuring data is processed quickly
    B. Increasing the speed of internet connections
    C. Providing transparency about how personal data is collected and used
    D. Enhancing the graphics of digital content (2 marks)

13. The purpose of the implementation phase of the program development cycle is to _____.
    A. write and integrate code into a working software system
    B. design the software architecture
    C. create test cases
    D. gather user feedback                                                              (2 marks)

14. What is the unit of measuring microprocessor speed?
    A. Byte
    B. Hertz
    C. Volts
    D. Watts                                                                             (2 marks)

15. Which one of the following types of computers can be used to make predictions with advanced modeling and simulations?
    A. Supercomputers
    B. Analogue computers
    C. Hybrid computers
    D. Digital computers                                                                 (2 marks)

16. The critical component in a computer system that is responsible for interpreting and executing **MOST** of the commands is known as _____.
    A. system unit
    B. power supply unit
    C. central processing unit
    D. backing storage device                                                            (2 marks)

17. Data security goal that ensures data is not altered without the permission of the owner is known as _____.
    A. data confidentiality
    B. data integrity
    C. non-repudiation
    D. data availability                                                                 (2 marks)

18. Which one of the following is a very high-speed semiconductor memory which can speed up the CPU?
    A. Cache Memory
    B. Main Memory
    C. Secondary Memory
    D. Primary Memory                                                                    (2 marks)

19. Which one of the following types of network topology is **BEST** suited for large businesses, which must carefully control and coordinate the operation of distributed branch outlets?
    A. Ring
    B. Bus
    C. Mesh
    D. Star                                                                              (2 marks)

20. Which one of the following types of data transmission techniques supports transmission in both directions using a channel one direction at a time?
    A. Simplex
    B. Duplex
    C. Half duplex
    D. Half simplex                                                                                           (2 marks)

21. Which one of the following computer network devices will pass data packets between multiple network segments that use the same communication protocol and network architecture?
    A. Bridge
    B. Gateway
    C. Router
    D. Modem                                                                                                  (2 marks)

22. The following are advantages of developing systems using prototyping approach, **EXCEPT** _____.
    A. it ensures fast development of systems
    B. it is less costly
    C. it ensures that users are involved
    D. it is highly integrated                                                                                (2 marks)

23. Information systems that monitor the elementary activities and transactions of the organisations are referred to as _____.
    A. management level system
    B. operational level system
    C. knowledge level system
    D. strategic level system                                                                                 (2 marks)

24. Which one of the following statements **ACCURATELY** describes the application of ICT in catering for children with special needs?
    A. Talking books provide visual aids and translate texts into multiple languages
    B. Mobile phones with talk back offer auditory feedback and GPS-inbuilt walking sticks help communicate
    C. Talking books offer audio texts, talk back provides auditory feedback and GPS walking sticks aid mobility
    D. ICT interventions limit access to resources and segregate students                                     (2 marks)

25. The process by which a computer loads system files into main memory is known as _____.
    A. compression
    B. defragmentation
    C. booting
    D. file management                                                                                        (2 marks)

26. Microprocessor technology was used in _____.
    A. fifth generation
    B. first generation
    C. third generation
    D. fourth generation                                                                                      (2 marks)

27. The following are stages of data processing cycle:
    (i)        Data storage
    (ii)       Data input
    (iii)      Data interpretation
    (iv)      Data collection
    (v)       Data Preparation
    (vi)      Data processing

    Which of the above arrangement puts them in the correct order?
    A.        (i), (ii), (vi), (iv), (v) and (iii)
    B.        (iv), (v), (ii), (vi), (iii) and (i)
    C.        (i), (ii), (iii), (iv), (v) and (vi)
    D.        (iv), (v), (ii), (iii), (i) and (vi)        (2 marks)

28. Which one of the following types of printers **CANNOT** be categorised as impact printer?
    A.        Dot matrix printer
    B.        Daisy wheel printer
    C.        Thermal printer
    D.        Golf-ball printer        (2 marks)

29. Which one of the following is **NOT** an essential component of a management information system?
    A.        People resources
    B.        Hardware resources
    C.        Network resources
    D.        Data resources        (2 marks)

30. Which one of the following computer file formats can be used to launch an application?
    A.        .exe
    B.        .jpeg
    C.        . txt
    D.        .sys        (2 marks)

31. Which one of the following acquisition methods is **NOT** a type of IT outsourcing?
    A.        Offshoring
    B.        Onshoring
    C.        Nearshoring
    D.        Coreshoring        (2 marks)

32. Which one of the following **BEST** describes the network topology that minimises network redundancy?
    A.        Bus topology
    B.        Ring topology
    C.        Mesh topology
    D.        Tree topology        (2 marks)

33. A group of computers connected so that users can share resources and information and there is no central location for authenticating users, storing files or accessing resources is known as _____.
    A.        peer-to-peer network
    B.        server-based network
    C.        client network
    D.        server network        (2 marks)

34.     Transmission Control Protocol (TCP) _____.
     A.     uses a simple connectionless transmission model with a minimum protocol mechanism
     B.     is the protocol that major Internet applications such as the World Wide Web, email, remote administration and file transfer rely on
     C.     is a message-oriented transport layer protocol
     D.     is a transport-layer protocol     (2 marks)

35.     An intellectual property theft, that involves illegal copying of software, information or data is known as _____.
     A.     sabotage
     B.     fraud
     C.     alteration
     D.     piracy     (2 marks)

36.     Which one of the following threats is a type of malicious program that comes as an email with attractive messages and launches itself when an email is opened?
     A.     Hoax viruses
     B.     Trojan horse
     C.     Boot sector viruses
     D.     Worm     (2 marks)

37.     Identify the missing steps labeled (i) and (ii) on the software development lifecycle shown in the figure below:
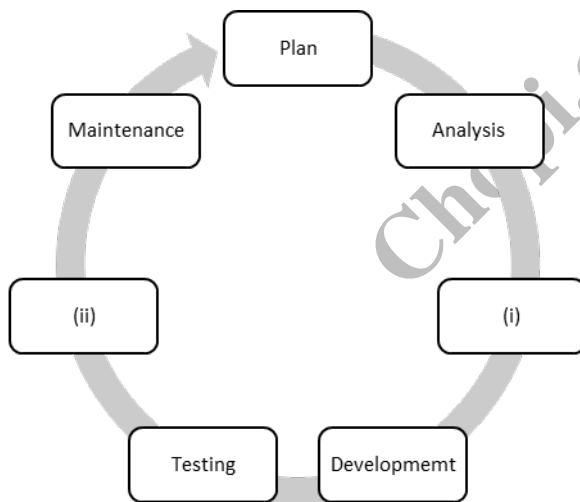


     A.     Define and Debug
     B.     Design and Implement
     C.     Design and Debug
     D.     Define and Implement     (2 marks)

38.     Which one of the following keyboard keys is **NOT** an example of Special PC Operation key?
     A.     F7 KEY
     B.     ESC KEY
     C.     CTRL KEY
     D.     ALT KEY     (2 marks)

39.    What is the symbol below used for while drawing flowcharts in programming?
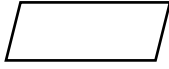


A.    Used as the process symbol
B.    Used to specify a particular input/output operation
C.    Used to indicate a point in a program where more than one direction of flow may occur after processing an operation
D.    Used to show the direction of flow of the flowchart                                    (2 marks)

40.    Language translators are used in programming to convert a source program into an object code, making it machine-readable. Which one of the following is **NOT** a language translator?
A.    Assembler
B.    Converter
C.    Interpreter
D.    Compiler                                                                                 (2 marks)

41.    Which one of the following activities describes the action where a programmer goes through the program on paper before entering it into the computer?
A.    Using debugging utilities
B.    Using test data
C.    Dry running
D.    Paper checking                                                                            (2 marks)

42.    A named memory location used for temporary storage of data items whose values may change during execution is known as _____.
A.    data type
B.    constant
C.    variable
D.    identifier                                                                                (2 marks)

43.    The primary purpose of online analytical processing (OLAP) is to _____.
A.    process database transactions
B.    analyse aggregated data
C.    perform classification activities
D.    collect data from external sources                                                        (2 marks)

44.    Which one of the following types of information can be sourced from both internal and external sources and is highly summarised?
A.    Strategic information
B.    Tactical information
C.    Operational information
D.    Structured information                                                                    (2 marks)

45. Which one of the following statements is **NOT** a characteristic of Decision Support Systems (DSS)?
    A. They can deal with mixed knowledge
    B. They have more analytical power as compared to other information systems
    C. They support the development of "what if analysis" so that different scenarios can be developed for decision-making
    D. They can justify why a decision was arrived at (2 marks)

46. Which one of the following security measures **BEST** describes the data security process that enables organisations to manage who is authorised to manipulate corporate data and resources?
    A. Encryption
    B. Access control
    C. Authorisation
    D. Filtering (2 marks)

47. Which one of the following health issues is **NOT** associated with ICT?
    A. Musculoskeletal issues
    B. Digital eye strain
    C. Repetitive stress injuries
    D. Sleeping Problems (2 marks)

48. Which one of the following programming languages involves the use of mnemonics to write its source code?
    A. Fourth generation language
    B. First generation language
    C. Second generation language
    D. Third generation language (2 marks)

49. Which one of the following statements does **NOT** describe the role of ICT in education?
    A. To expand the possibility of collaborative learning in the classroom
    B. It provides students with the opportunity to exhibit their thoughts and opinions in the most effective manner
    C. It enhances teaching effectiveness
    D. It enables organisations to ensure customer loyalty (2 marks)

50. The role of a switch in a Local Area Network (LAN) is to _____.
    A. filter and forward data packets
    B. provide internet access
    C. encrypt data
    D. connect different networks (2 marks)

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## COMPUTING SYSTEMS

**MONDAY: 19 August 2024. Morning Paper.**                    **Time Allowed: 2 hours.**

**This paper consists of fifty (50) Multiple Choice Questions. Answer ALL questions by indicating the letter (A, B, C or D) that represents the correct answer. Each question is allocated two (2) marks.**

1. The primary function of the motherboard is to _____.
    A.    provide power to the computer
    B.    store data permanently
    C.    connect all the other components
    D.    display images on the screen                                    (2 marks)

2. Which one of the following is **NOT** true about computer files?
    A.    Files are collections of data saved to a storage medium
    B.    Every file has a filename
    C.    A file extension is established by the user to indicate the date it was created
    D.    A file contains data                                            (2 marks)

3. Which one of the following is a type of network that spans a large geographic area such as multiple cities?
    A.    Local Area Network (LAN)
    B.    Wireless Local Area Network (WLAN)
    C.    Metropolitan Area Network (MAN)
    D.    Personal Area Network (PAN)                                      (2 marks)

4. What role does a transaction processing system play in an organisation?
    A.    Supporting strategic decision-making
    B.    Processing and recording day-to-day transactions
    C.    Creating data visualisations for analysis
    D.    Facilitating long-term planning                                 (2 marks)

5. The main purpose of an Executive Support System (ESS) is to _____.
    A.    provide detailed, scientific analysis of operational data
    B.    support strategic decision-making at the executive level
    C.    automate routine tasks for lower-level employees
    D.    monitor day-to-day operations within a company                  (2 marks)

6. A benefit of cloud-based accounting software is that it _____.
    A.    requires frequent downloads
    B.    can only be accessed from a specific computer
    C.    allows for remote access and collaboration
    D.    is more expensive                                               (2 marks)

7. Which one of the following refers to the process of modifying information systems to meet changing needs?
    A.    System upkeep
    B.    System maintenance
    C.    System modification
    D.    System management                                              (2 marks)

8.      Which one of the following is **NOT** a fundamental programming concept?
        A.      Variables and data types
        B.      Functions and methods
        C.      Classes and objects
        D.      File systems and databases                                                      (2 marks)

9.      Which one of the following is **NOT** a program development cycle activity?
        A.      Programming coding
        B.      Tracing and debugging
        C.      Program analysis
        D.      Program procedures                                                              (2 marks)

10.     Which one of the following is **NOT** a factor to determine the processing power of a digital computer?
        A.      Processor clock speed
        B.      The operating system capability
        C.      Available internal memory
        D.      Size of the data bus                                                            (2 marks)

11.     Which one of the following number systems is used by modern computers to represent characters and numbers internally?
        A.      Octal
        B.      Hexadecimal
        C.      Binary
        D.      Denary                                                                          (2 marks)

12.     Which one of the following is a type of data processing where data is broken down into frames and processed using two or more CPUs within a single computer system?
        A.      Batch processing
        B.      Real time processing
        C.      Multiprocessing
        D.      Online processing                                                               (2 marks)

13.     A primary goal of CASE tools in software development is to _____.
        A.      automate the entire software development process
        B.      assist software engineers in various stages of the development lifecycle
        C.      replace human software engineers with artificial intelligence
        D.      minimise the need for software testing                                          (2 marks)

14.     Which one of the following is an application area of ICT that focuses on creating and managing digital content for entertainment purposes?
        A.      E-commerce
        B.      Telecommunication
        C.      Multimedia
        D.      Database management                                                             (2 marks)

15.     Which one of the following is the last step of data processing cycle?
        A.      Data output
        B.      Data storage
        C.      Data preparation
        D.      Data cleaning                                                                   (2 marks)

16.     Which type of network topology is **BEST** suited for large businesses which must carefully control and coordinate the operation of distributed branch outlets?
        A.      Ring
        B.      Mesh
        C.      Tree
        D.      Star                                                                            (2 marks)

17.     Which one of the following is an impact of ICT on the entertainment industry?
        A.      It has made entertainment less accessible to the general public
        B.      It has decreased the variety of entertainment options available
        C.      It has facilitated the distribution of digital content through streaming services and online platforms
        D.      It has decreased revenue for content creators                                  (2 marks)

18. Which one of the following is **NOT** a measure to control social engineering threats?
    A.  Limiting access to sensitive information
    B.  Training users of information
    C.  Keeping hardware updated
    D.  Keeping software updated                                                      (2 marks)

19. Which one of the following is **NOT** an advantage of network software?
    A.  Enables network administrators to control access to data
    B.  Enables network administrators to install antivirus programs
    C.  Enables network administrators to add and remove users
    D.  Enables network administrators to ensure uninterrupted access to network resources   (2 marks)

20. Which one of the following describes an interactive group communication between three or more people in two or more locations through an electronic medium?
    A.  Telecomputing
    B.  Tele-networking
    C.  Teleconferencing
    D.  Telepresence                                                                  (2 marks)

21. A system characteristic which states that a system can achieve its goals using different methods is known as _____.
    A.  equifinality
    B.  synergy
    C.  suboptimisation
    D.  environment                                                                   (2 marks)

22. Which one of the following is a primary benefit of ICT in the society?
    A.  Increased unemployment
    B.  Widening of the digital divide
    C.  Improved access to information and services
    D.  Decreased productivity                                                        (2 marks)

23. Which one of the following **BEST** describes the iterative approach to the SDLC?
    A.  A linear, step-by-step process from analysis to deployment
    B.  A continuous cycle of planning, building and testing in multiple iterations
    C.  A method of software development that skips the testing phase
    D.  A strategy for managing hardware projects                                     (2 marks)

24. Software tool that enable a user to interact with a computer for specific purposes is known as _____.
    A.  software driver
    B.  spyware
    C.  shareware
    D.  application                                                                   (2 marks)

25. Which one of the following are the two major categories of software?
    A.  Operating system and utility
    B.  Personal productivity and system
    C.  System and application
    D.  System and utility                                                            (2 marks)

26. Which of the following are the main software components of DSS?
    (i)    Database management system (DBMS)
    (ii)   Model management system
    (iii)  Support tools
    (iv)   Internet

    A.  (i), (ii) and (iii)
    B.  (ii), (iii) and (iv)
    C.  (i), (iii) and (iv)
    D.  (i), (ii), (iii) and (iv)                                                     (2 marks)

27. Which one of the following is **NOT** an objective of MIS?
    A.  Facilitate the decisions-making process
    B.  Provide requisite information at each level of management
    C.  Capturing data from internal and external sources
    D.  Support installation of software                                    (2 marks)

28. Which one of the following is an internal source of information?
    A.  Online journals
    B.  Newspaper publications
    C.  Organisation's sales data
    D.  Competitor information                                              (2 marks)

29. Which one of the following data processing methods involve identifying patterns, relationships and trends within large datasets?
    A.  Data mining
    B.  Data storage
    C.  Data transformation
    D.  Data retrieval                                                      (2 marks)

30. Which one of the following is a disadvantage of using Online Transaction Processing (OLTP) systems?
    A.  Limited scalability
    B.  Inability to handle high transaction volumes
    C.  Long response times
    D.  Reduced data accuracy                                               (2 marks)

31. Which one of the following industries commonly uses Online Transaction Processing (OLTP) systems?
    A.  Agriculture
    B.  Construction
    C.  Healthcare
    D.  Automotive                                                          (2 marks)

32. What type of network communication media is **BEST** suited for high-speed internet connections in areas with limited infrastructure?
    A.  Fiber optic cable
    B.  Coaxial cable
    C.  Microwave systems
    D.  Satellite systems                                                   (2 marks)

33. Which one of the following tasks is **NOT** related to IT outsourcing?
    A.  Software development
    B.  Fabric purchasing
    C.  Network management
    D.  Software troubleshooting                                            (2 marks)

34. Which one of the following network devices will regenerate a signal as it travels over long distances?
    A.  Server
    B.  Repeater
    C.  Access point
    D.  Router                                                              (2 marks)

35. In which application area of ICT are Customer Relationship Management (CRM) systems commonly used?
    A.  Education
    B.  Healthcare
    C.  Banking
    D.  Business                                                            (2 marks)

36. A program that converts a high-level language source code into a machine code one statement at a time is known as _____.
    A.  interpreter
    B.  compiler
    C.  assembler
    D.  linker                                                              (2 marks)

37. Which one of the following is **NOT** an advantage of using Rapid Application Development (RAD) approach to system development?
   A.    Timely development of systems
   B.    Reduces cost of system development
   C.    Improves the reusability of components
   D.    Supports the management of many stakeholders                                (2 marks)

38. The purpose of a heat sink in a computer system is to _____.
   A.    cool down the motherboard
   B.    cool down the memory cards
   C.    cool down the CPU                                                            (2 marks)
   D.    enhance graphics performance

39. Which one of the following is the type of software that allows users to customise and control hardware settings?
   A.    Utility software
   B.    System software
   C.    Application software
   D.    Firmware                                                                    (2 marks)

40. In which application area of ICT are Geographic Information Systems (GIS) commonly used?
   A.    Education
   B.    Healthcare
   C.    Transportation
   D.    Banking                                                                     (2 marks)

41. Which one of the following file formats is commonly used for animated graphics on the web?
   A.    .gif
   B.    .png
   C.    .bmp
   D.    .jpg                                                                        (2 marks)

42. The goal of data cleansing in data processing is to _____.
   A.    store data in a secure environment
   B.    organise data for efficient retrieval
   C.    ensure data accuracy and consistency
   D.    analyse data for insights and decision-making                               (2 marks)

43. Which one of the following is **NOT** a way in which the use of ICT can pose a risk to privacy rights?
   A.    Publishing of personal information
   B.    Increasing access to resources through the extension of copyright
   C.    Spreading of false information
   D.    Use of ICT tools to undermine opposing voices in democracies                (2 marks)

44. What role does data integrity play in Online Transaction Processing (OLTP) systems?
   A.    Data integrity is not important in OLTP systems
   B.    OLTP systems prioritise data availability over data integrity
   C.    OLTP systems ensure that data is accurate and consistent
   D.    OLTP systems focus on storing large volumes of data                         (2 marks)

45. In a flowchart, what does a diamond symbol represent?
   A.    Start or end point of the process
   B.    Decision point or branching in the process flow
   C.    Process or activity
   D.    Data input or output                                                        (2 marks)

46. The hardware device that enables multiple devices to connect to a computer network is known as?
   A.    Router
   B.    Multiplexer
   C.    Bridge
   D.    Hub                                                                         (2 marks)

47. Which one of the following is **NOT** a way through which ICT can improve security of the data?
   A.    Data encryption
   B.    Use of fingerprint detection methods
   C.    Use of physical door locks
   D.    Use of data encryption systems                                              (2 marks)

48. Which one of the following is **NOT** a computer related crime?
   A.    Eavesdropping
   B.    Spamming
   C.    Hacking
   D.    Denial of service                                                           (2 marks)

49. Which programming paradigm focuses on writing code as a series of step-by-step instructions?
   A.    Procedural programming
   B.    Object-oriented programming
   C.    Functional programming
   D.    Declarative programming                                                     (2 marks)

50. Which one of the following is **NOT** an advantage of peer to peer network?
   A.    Enhancing the privacy and anonymity of nodes
   B.    Cheap to implement
   C.    Enhances data security
   D.    Increases availability and reliability of resources                         (2 marks)

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**CISSE FOUNDATION LEVEL**

**COMPUTING SYSTEMS**

**MONDAY: 22 April 2024. Morning Paper.**                                    **Time Allowed: 2 hours.**

**Answer ALL questions by indicating the letter (A, B, C or D) that represents the correct answer. This paper is made up of fifty (50) Multiple Choice Questions. Each question is allocated two (2) marks.**

1.  Which one of the following statements is **CORRECT** about impact printers?
    A.    Expensive
    B.    Apply optical technology
    C.    Examples are ink jet and thermal devices
    D.    Uses striking mechanism                                                      (2 marks)

2.  Which one of the following steps kick starts the data processing life cycle?
    A.    Data analysis
    B.    Data collection
    C.    Data storage
    D.    Data retrieval                                                                (2 marks)

3.  Which network topology is a point-to-point line configuration?
    A.    Star
    B.    Bus
    C.    Ring
    D.    Mesh                                                                          (2 marks)

4.  Which file format is primarily used for storing and exchanging documents independent of software, hardware or operating system?
    A.    .txt
    B.    .csv
    C.    .pdf
    D.    .zip                                                                          (2 marks)

5.  From time to time we have to make effort to reduce the size of a file in order to store or share across multiple users. Which options below allows this process to occur seamlessly?
    A.    .jpg
    B.    .zip
    C.    .docx
    D.    .mp3                                                                          (2 marks)

6.  What is the primary function of a computer's Central Processing Unit (CPU)?
    A.    Data storage
    B.    Data input
    C.    Data processing
    D.    Data output                                                                  (2 marks)

7.  Rapid Application Development (RAD) is a form of _____.
    A.    Waterfall model
    B.    Agile Software Development Methodology
    C.    Object-oriented model
    D.    Prototyping model                                                            (2 marks)

8.      Which programming language is commonly used for web development and creating dynamic web pages?
        A.      Java
        B.      Python
        C.      HTML
        D.      SQL                                                                                              (2 marks)

9.      What is the main output of syntax analysis in computer programming?
        A.      A list of tokens
        B.      A parse tree
        C.      A list of semantic errors
        D.      A list of logical errors                                                                          (2 marks)

10.     Which networking component allows computers and devices to connect, share data and communicate within a localised area?
        A.      Router
        B.      Modem
        C.      Switch
        D.      Firewall                                                                                         (2 marks)

11.     Which one of the following **BEST** describes the relationship between hardware and software?
        A.      Hardware is the physical component and software is the user interface
        B.      Hardware provides the instructions for software to execute
        C.      Hardware and software are interchangeable terms referring to computer components
        D.      Software controls and directs the hardware to perform specific tasks                              (2 marks)

12.     Which one of the following is an example of system software that interacts directly with computer hardware?
        A.      Word Processor
        B.      Web Browser
        C.      Device Driver
        D.      Video Game                                                                                       (2 marks)

13.     Which one of the following statements is **TRUE** about CASE tools?
        A.      They reduce the drudgery in a software engineer's work
        B.      They degrade the quality of software
        C.      They increase maintenance cost
        D.      They increase the processing speed                                                               (2 marks)

14.     Which one of the following is a **KEY** benefit of Online Analytical Processing (OLAP) systems?
        A.      Real-time transaction processing
        B.      Storing transaction data
        C.      Pre-aggregating data for faster query performance
        D.      Managing network access and reference models                                                    (2 marks)

15.     How do software updates and upgrades impact the relationship between hardware and software?
        A.      They modify the physical components of the computer
        B.      They add new features or functionalities that may require hardware improvements
        C.      They optimise the performance of existing hardware
        D.      They replace the need for hardware by enhancing software capabilities                           (2 marks)

16.     What is the purpose of assigning an IP address to a device in a network?
        A.      To identify the type of device
        B.      To determine the physical location of the device
        C.      To enhance the speed of data transmission
        D.      To provide a unique identifier for the device within the network                               (2 marks)

17.     Which ICT tool is commonly used for real-time collaboration and document sharing in business settings?
        A.      Customer Relationship Management (CRM)
        B.      Enterprise Resource Planning (ERP)
        C.      Video Conferencing
        D.      Supply Chain Management (SCM)                                                                   (2 marks)

18.    Which one of the following is **NOT** typically configured when setting up a network?
       A.    DNS server
       B.    MAC address
       C.    Subnet mask
       D.    Port number                                                                      (2 marks)

19.    What does a Virtual Private Network (VPN) software primarily provide?
       A.    Secure and encrypted connection over a public network, such as the internet
       B.    Translation between different network protocols
       C.    Dynamic IP address assignment to network devices
       D.    File sharing capabilities between network devices                                (2 marks)

20.    What is the role of Big Data in healthcare when using ICT?
       A.    Managing hospital staff
       B.    Analysing large volumes of healthcare data
       C.    Conducting surgical procedures
       D.    Tracking patient physical activity                                               (2 marks)

21.    What is the primary preventive measure to reduce the risk of Repetitive Strain Injury (RSI) in computer users?
       A.    Increasing typing speed
       B.    Using a non-ergonomic chair
       C.    Taking regular breaks and stretching exercises
       D.    Ignoring early symptoms of discomfort                                            (2 marks)

22.    What is the primary focus of the maintenance phase in the SDLC?
       A.    Developing new features and functionalities
       B.    Enhancing and updating the software based on user feedback and changing requirements
       C.    Writing the initial code for the software
       D.    Creating detailed documentation for the software                                (2 marks)

23.    A system whose inputs, process and the outputs are known with certainty is known as?
       A.    Probabilistic
       B.    Deterministic
       C.    Open
       D.    Close                                                                            (2 marks)

24.    What does the acronym "IDE" stand for in the context of computer programming?
       A.    Integrated Development Environment
       B.    Intelligent Data Exchange
       C.    Interface Design Enhancement
       D.    Input/output Data Encryption                                                     (2 marks)

25.    What is the primary purpose of MICR technology?
       A.    Storing multimedia files
       B.    Sorting and processing checks
       C.    Encoding credit card information
       D.    Scanning barcodes                                                                (2 marks)

26.    Which type of information system is primarily used for routine transaction processing and maintaining operational data?
       A.    Decision Support System (DSS)
       B.    Executive Information System (EIS)
       C.    Transaction Processing System (TPS)
       D.    Management Information System (MIS)                                              (2 marks)

27.    A system that mimic the pattern recognition capabilities of the human brain is known as?
       A.    An expert system
       B.    Artificial Intelligence
       C.    Neutral network
       D.    Development engine                                                               (2 marks)

28. Which information system integrates data and processes across various functional areas within an organisation, such as finance, human resources and operations?
    A.    Enterprise Resource Planning (ERP) System
    B.    Customer Relationship Management (CRM) System
    C.    Supply Chain Management (SCM) System
    D.    Business Intelligence (BI) System                                                                  (2 marks)

29. Which one of the following is a characteristic feature of OLAP systems?
    A.    They are optimised for real-time transaction processing
    B.    They support complex queries and multidimensional data analysis
    C.    They are primarily used for routine business operations
    D.    They focus on managing and processing large volumes of transactional data              (2 marks)

30. Which one of the following statements define E-mail Spoofing?
    A.    Sending an E-mail that appears to have been originated from a source while indeed it is not
    B.    E-mail sent to thousands of users
    C.    Sending an identical E-mail message an address
    D.    Sending threatening E-mails                                                               (2 marks)

31. In which application area of ICT are technologies like VPNs, firewalls and encryption commonly used to protect data and ensure secure communication over networks?
    A.    Network Security
    B.    Network Management
    C.    Wireless Communication
    D.    Internet of Things (IoT)                                                                 (2 marks)

32. Which one of the following is an application area of ICT that involves the use of computing resources and services delivered over the internet, allowing users to access and utilise resources on-demand?
    A.    Artificial Intelligence
    B.    Data Analytics
    C.    Robotics
    D.    Cloud Computing                                                                           (2 marks)

33. In which network topology are all devices connected to a central hub or switch and communication occurs through the central point?
    A.    Mesh topology
    B.    Bus topology
    C.    Ring topology
    D.    Star topology                                                                             (2 marks)

34. In commerce, which technology facilitates the secure and efficient exchange of business documents, such as invoices, purchase orders and shipping notices between trading partners?
    A.    Block chain
    B.    E-commerce platforms
    C.    Electronic Data Interchange (EDI)
    D.    Virtual Reality (VR)                                                                      (2 marks)

35. The **MOST** salient feature of second generation computers that distinguish it from the others is?
    A.    Transistors
    B.    Programming Intelligence
    C.    System Knowledge
    D.    Vacuum tubes                                                                              (2 marks)

36. Businesses automation of repetitive tasks so as to enhance operational efficiency and improve customer service is known as?
    A.    Robotic Process Automation (RPA)
    B.    Mechanisation
    C.    Internet of Things (IoT)
    D.    Cloud Computing                                                                           (2 marks)

37. A system having a software not compatible with the hardware components of a computer system experiences?
    A.    The software automatically adjusts to the hardware specifications
    B.    The computer system may experience performance issues or failures
    C.    The hardware components will adapt to the software requirements
    D.    Compatibility issues do not affect the performance of the computer system          (2 marks)

38. Fly-by-wire system in which instructions are input into a computer system is used in which field?
    A.    Computer games
    B.    Simulators
    C.    Business field
    D.    Airline          (2 marks)

39. How has ICT influenced communication among individuals and communities globally?
    A.    It has reduced the need for face-to-face interactions
    B.    It has limited the availability of information and knowledge
    C.    It has increased the speed and accessibility of information exchange
    D.    It has eliminated the need for written communication          (2 marks)

40. What is the primary characteristic of a soft copy output?
    A.    It is a physical, tangible document
    B.    It is displayed on an electronic screen or monitor
    C.    It is printed on paper using an ink jet printer
    D.    It is stored in a physical storage device          (2 marks)

41. In batch processing, how is data typically processed?
    A.    In real-time as it is received
    B.    In large, predefined batches or groups
    C.    On a continuous, ongoing basis
    D.    Using parallel processing units          (2 marks)

42. A social challenge resulting from the increasing reliance on digital technologies and online platforms is?
    A.    Enhanced accessibility to educational resources
    B.    Increased opportunities for remote work and collaboration
    C.    Digital divide and inequalities in access to technology
    D.    Improved healthcare services through telemedicine          (2 marks)

43. What is a potential benefit of ICT in addressing environmental challenges and promoting sustainable practices?
    A.    Increased reliance on digital devices leading to electronic waste
    B.    Adoption of smart technologies for energy efficiency and resource management
    C.    Limited access to information on environmental issues
    D.    Reduced need for conservation efforts and environmental initiatives          (2 marks)

44. Variables in programming are used for?
    A.    Storing and manipulating data
    B.    Executing conditional statements
    C.    Defining functions and procedures
    D.    Displaying output on the screen          (2 marks)

45. What does the term "syntax" in programming, refer to?
    A.    The logical flow of the program
    B.    The output produced by the program
    C.    The rules and structure governing the formation of valid statements and expressions in a programming language
    D.    The process of debugging and error correction          (2 marks)

46. What is the primary purpose of using comments in a program?
    A.    To specify the input data for the program
    B.    To provide explanations and clarify the purpose of the code for other programmers or for maintenance
    C.    To execute specific tasks or operations
    D.    To store and manipulate data within the program          (2 marks)

47.     What does the term "phishing" refer to in the context of cybersecurity?
        A.      Gaining unauthorised access to a system
        B.      Disguising data using encryption
        C.      Trickery to obtain sensitive information
        D.      Protecting against malware attacks                                    (2 marks)

48.     A computer program with errors is said to have?
        A.      Follies
        B.      Mistakes
        C.      Bugs
        D.      Spam                                                                  (2 marks)

49.     Which one of the following is considered a low-level programming language?
        A.      Java
        B.      C++
        C.      Python
        D.      Assembly language                                                    (2 marks)

50.     What is the term for the unethical practice of spreading false information or rumors online with the intent to damage a person's reputation?
        A.      Cyberterrorism
        B.      Cyberbullying
        C.      Disinformation
        D.      Hacking                                                              (2 marks)

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**CISSE FOUNDATION LEVEL**

**COMPUTING SYSTEMS**

**MONDAY: 4 December 2023. Morning Paper.**                              **Time Allowed: 2 hours.**

**Answer ALL questions by indicating the letter (A, B, C or D) that represents the correct answer. This paper is made up of fifty (50) multiple choice questions. Each question is allocated two (2) marks.**

1.      A series of operations or actions to convert some input to useful output is known as:
        A.      Implementation
        B.      Programming
        C.      Translating
        D.      Processing                                                                                      (2 marks)

2.      Which of the following is **NOT** a scanning input device of a computer system?
        A.      MICR
        B.      OCR
        C.      OVR
        D.      OMR                                                                                              (2 marks)

3.      The name given to the amount of data that a communication channel can carry is:
        A.      Attenuation
        B.      Jitter
        C.      Latency
        D.      Bandwidth                                                                                        (2 marks)

4.      Identify the missing step labelled (i) on the data processing cycle shown in the figure below.
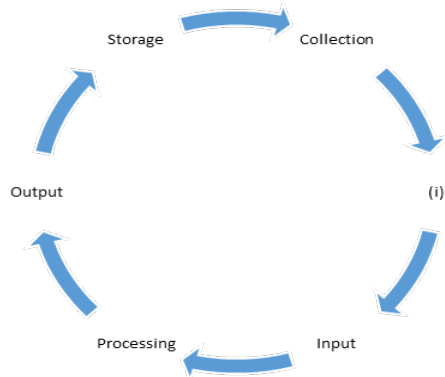


        A.      Capture
        B.      Preparation
        C.      Coding
        D.      Presentation                                                                                     (2 marks)

5.      Which of the following devices allows users to interact with a computer using their finger or stylus?
        A.      Monitor
        B.      Trackball
        C.      Computer output on microform
        D.      Touchscreen                                                                                      (2 marks)

6. Which type of data processing involves breaking up a large task into smaller, more manageable sub-tasks that can be processed simultaneously?
   A. Parallel processing
   B. Batch processing
   C. Distributed processing
   D. Real-time processing (2 marks)

7. Suggest the name of circuitry part of a computer processor that directs operations.
   A. Arithmetic and logic unit
   B. Control Unit
   C. Memory Unit
   D. Cache (2 marks)

8. The network device that connects devices within a local area network (LAN) and uses MAC addresses to forward data frames to their intended destination is called:
   A. Bridge
   B. Router
   C. Server
   D. Switch (2 marks)

9. A set of instructions or a step-by-step procedure for solving a specific problem or performing a particular task is referred to as:
   A. Algorithm
   B. Program
   C. Flowchart
   D. Script (2 marks)

10. The delivery of computing services such as storage and processing, over the internet, often through remote data centers is known as:
    A. Machine learning
    B. Networking
    C. Cloud computing
    D. Teleworking (2 marks)

11. Which of the following is **NOT** a type of peer-to-peer (P2P) computer network?
    A. Unstructured P2P
    B. Centralised P2P
    C. Structured P2P
    D. Hybrid P2P (2 marks)

12. Select the technology below that makes fifth generation of computers unique.
    A. Artificial intelligence
    B. Programming intelligence
    C. System knowledge
    D. Robotics technology (2 marks)

13. What can the developer use to demonstrate to the client that the system satisfies all or a portion of requirements, in RAD information systems development process.
    A. Feedback
    B. Prototype
    C. Testing
    D. Deployment (2 marks)

14. Which of the following is **NOT** a type of CASE tools used in information systems development?
    A. Requirement Analysis Tool
    B. Code Generation Tool
    C. Test Case Generation Tool
    D. Software Engineering Tool (2 marks)

15. Which component of DSS gives a decision maker access to a variety of mockups that are developed for this specific application to assist in decision-making process?
    A. Database
    B. Model base
    C. Knowledge base
    D. Graphical user interface (2 marks)

16. Which type of data processing involves performing calculations and computations on data?
    A. Batch processing
    B. Real-time processing
    C. Online processing
    D. Analytical processing (2 marks)

17. Which of the following is **NOT** a characteristic of Online Transaction Processing systems?
    A. High transaction volume
    B. Rapid response time
    C. Complex query support
    D. Real-time data processing (2 marks)

18. Suggest the name given to a type of learning characterised by delivery and the use of instructional content that involves sound and sight.
    A. Online learning
    B. Audio-visual learning
    C. Competency based learning
    D. YouTube learning (2 marks)

19. What is the **MOST** appropriate name for a collection of various computers appearing as a single coherent system to its clients?
    A. Mail system
    B. Networking system
    C. Computer network
    D. Distributed system (2 marks)

20. Select from the list below an advantage of ring topology.
    A. The ring length is unlimited
    B. Easy to install and configure
    C. Number of nodes not limited
    D. It is difficult for cable or node to fail (2 marks)

21. The emerging technology that allows employees to work away from their office is called:
    A. Virtual office
    B. OLTP
    C. Remote connection
    D. Telecommuting (2 marks)

22. Which of the following provides a visual overview of a business process?
    A. Data graph
    B. Flowchart
    C. Workflow diagram
    D. Decision tree (2 marks)

23. Which of the following technologies could **BEST** be used in a Personal Area Network (PAN) for connectivity?
    A. Microwave
    B. Bluetooth
    C. Token ring
    D. Pinging (2 marks)

24. The process of modifying an information system to meet changing user needs is known as:
    A. System upkeep
    B. System maintenance
    C. System modification
    D. System management (2 marks)

25. Which phase of information development is concerned with the specification of system's goal?
    A.    System analysis
    B.    System design
    C.    System development
    D.    System implementation                                                          (2 marks)

26. Which of the following is an example of low-level programming language?
    A.    Visual basic language
    B.    JavaScript language
    C.    Assembly language
    D.    Pascal language                                                                (2 marks)

27. Which of the following system components is responsible for ensuring that the system is working to fulfil its objective?
    A.    Output
    B.    Processing
    C.    Feedback
    D.    Control                                                                        (2 marks)

28. Which category of computer-based information systems is concerned with supporting the functional areas of an organisation?
    A.    Strategic information systems
    B.    Business information systems
    C.    Expert systems
    D.    End user computing systems                                                     (2 marks)

29. The information systems that monitor the elementary activities and transactions of organisations are called:
    A.    Management-level systems
    B.    Knowledge-level systems
    C.    Operational-level systems
    D.    Strategic-level systems                                                        (2 marks)

30. What is the primary purpose of an MIS at the management level?
    A.    Data entry and collection
    B.    Hardware and software management
    C.    Decision support and information provision
    D.    Network administration                                                         (2 marks)

31. Which of the following is **NOT** a component of business workflow?
    A.    Input
    B.    Transformation
    C.    Output
    D.    Schedule                                                                       (2 marks)

32. Which component of a computer is often referred to as the "brain" of the system?
    A.    RAM
    B.    CPU
    C.    Hard Drive
    D.    Monitor                                                                        (2 marks)

33. Which level of the management hierarchy supports the formulation of organisational strategies?
    A.    Operational level
    B.    Management level
    C.    Knowledge level
    D.    Strategic level                                                                (2 marks)

34. Which type of software is responsible for managing hardware resources and providing essential services to other software applications?
    A.    Application software
    B.    System software
    C.    Utility software
    D.    Firmware                                                                       (2 marks)

35. What type of computer memory is volatile and loses its data when the computer is powered off?
    A. ROM
    B. SSD
    C. HDD
    D. RAM                                                                                    (2 marks)

36. Which part of the body is affected by repetitive strain injury (RSI)?
    A. Hands
    B. Eyes
    C. Wrists
    D. Shoulders                                                                              (2 marks)

37. Which of the following types of information systems is used to take a customer's order in a business?
    A. Automation system
    B. Management information system
    C. Transaction processing system
    D. Decision support system                                                                (2 marks)

38. What do you call the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets?
    A. Mobi-trade
    B. Brick-and-mortar
    C. Ubiquitous commerce
    D. E-commerce                                                                             (2 marks)

39. The key component of an expert system responsible for making decisions and drawing conclusions based on the information stored in the knowledge base is called:
    A. Inference engine
    B. Decision support system
    C. User interface
    D. Data source                                                                            (2 marks)

40. What do you call a business practice in which an external service provider delivers IT-enabled business process, application service and infrastructure solutions for business outcomes?
    A. Sub-contracting
    B. Consulting
    C. Delegating
    D. Outsourcing(2                                                                              marks)

41. Which of the following data transmission media has the highest transmission speed in a network?
    A. Coaxial cable
    B. Twisted pair cable
    C. Fiber optical
    D. Electrical cable                                                                        (2 marks)

42. What does the term "BIOS" stand for in computing?
    A. Binary Input/Output System
    B. Best Internet Operating System
    C. Basic Input/Output System
    D. Backup Input/Output System                                                             (2 marks)

43. The end product of data processing as used in information systems is called:
    A. Data
    B. Processing
    C. Control
    D. Information                                                                            (2 marks)

44. The process of finding and correcting errors in the source code as used in computer programming is known as:
    A. Desk checking
    B. Debugging
    C. Decoding
    D. Testing                                                                                (2 marks)

45. What is the purpose of data encryption in computing?
    A.    To increase the speed of data transfer
    B.    To protect data from unauthorised access
    C.    To connect to the internet
    D.    To create data backups                                                      (2 marks)

46. Which of the following is **NOT** a form of cyber bullying?
    A.    Creating an embarrassing picture of your classmate and forwarding it to your friend's email addresses
    B.    Sending someone a mean text
    C.    Bullying someone in the hallway
    D.    Threatening someone in an instant message                                   (2 marks)

47. Which of the following are major issues arising out of the growing reliance on information technology?
    (i)    Profitability
    (ii)   Security threats
    (iii)  Privacy concerns

    A.    (i) and (ii) only
    B.    (i) and (iii) only
    C.    (ii) and (iii) only
    D.    (i), (ii) and (iii)                                                         (2 marks)

48. Which of the following is **NOT** a computer programming language?
    A.    PASCAL
    B.    UNIX
    C.    FORTRAN
    D.    COBOL                                                                       (2 marks)

49. Suggest the name given to a permanent software stored into a read only memory chipset.
    A.    Middleware
    B.    ROM-ware
    C.    Firmware
    D.    Package ware                                                                (2 marks)

50. What do you call an operating system that provides all particular features required to communicate over a network to access or share network resources?
    A.    Network operating system
    B.    Disk operating system
    C.    Mac operating system
    D.    Android operating system                                                   (2 marks)

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**CISSE FOUNDATION LEVEL**

**COMPUTING SYSTEMS**

**MONDAY: 21 August 2023. Morning Paper.**                    **Time Allowed: 2 hours.**

**Answer ALL questions by indicating the letter (A, B, C or D) that represents the correct answer. The paper is made up of fifty (50) multiple choice questions. Each question is allocated two (2) marks.**

1.  Which of the following program has an art of drawing pictures on computer screens?
    A.    Windows 10
    B.    Spreadsheet
    C.    Graphics application
    D.    Word processor                                                        (2 marks)

2.  An information system enabling documents and other web resources to be accessed over the Internet is known as?
    A.    World Wide Web (WWW)
    B.    Electronic mail system
    C.    Mailing list
    D.    Ecommerce                                                             (2 marks)

3.  Which of the following is an input device?
    A.    Scanner
    B.    Printer
    C.    Monitor
    D.    RAM                                                                   (2 marks)

4.  In a computer system, what is the function of Basic Input /Output System (BIOS)?
    A.    To manage all other applications and programs in a computer
    B.    To perform specific functions for the end user by interacting directly with it
    C.    To allow users to navigate, open, and otherwise manipulate files on a computer from a command line
    D.    To perform start-up procedures when the computer is turned on          (2 marks)

5.  An electronic device accepts data as input, transforms it using a program but produces wrong result. What is the main reason leading to computation results being false?
    A.    Power blackout
    B.    Unavailable processor
    C.    Incorrect input data
    D.    No display screen                                                     (2 marks)

6.  Which one of the following is a file extension of a graphics software?
    A.    JPG
    B.    XLS
    C.    PRG
    D.    DOC                                                                   (2 marks)

7.  The software which acts as an interface between a user and the computer hardware is known as?
    A.    Operating System
    B.    Application software
    C.    Translator
    D.    Utility                                                               (2 marks)

8.     Which of the following is **NOT** a component of a computer hardware?
       A.     Sound card
       B.     Video display unit
       C.     Word Processor
       D.     Random Access Memory                                              (2 marks)

9.     Which of the following **BEST** describes a worm virus?
       A.     It infects the boot sector
       B.     It propagates through the internet and e-mail
       C.     It deletes computer files
       D.     It alters the file contents and folder structure                  (2 marks)

10.    What is the effect of using Integrated Circuits (ICs) in manufacturing computer?
       A.     Increased the amount of heating
       B.     Reduced the peripheral devices to be used
       C.     Reduced the performance capacity of the computer
       D.     Reduced the size and cost of computers                            (2 marks)

11.    Which of the following steps in data processing generally occurs prior to data collection?
       A.     Transcribing data
       B.     Inputting data
       C.     Coding of closed-ended questions
       D.     Storage of data                                                   (2 marks)

12.    The process of fixing incorrect, incomplete, duplicate or otherwise erroneous data in a data set is known as?
       A.     Data entry
       B.     Data modification
       C.     Data coding
       D.     Data cleaning                                                     (2 marks)

13.    Which computer application has the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intellectual beings?
       A.     Entertainment
       B.     Artificial Intelligence
       C.     Education
       D.     Science and Research                                             (2 marks)

14.    Choose the transmission media that is **NOT** affected by electrical interferences.
       A.     Unshielded twisted pair
       B.     Infrared
       C.     Optical fiber
       D.     Radio                                                            (2 marks)

15.    The process of storing and accessing data and programs over the Internet instead of on the hard drive of a computer or device is known as?
       A.     Cloud processing
       B.     Multiprogramming
       C.     Batch processing
       D.     On line processing                                               (2 marks)

16.    The following are examples of Transaction Processing System (TPS), **EXCEPT**?
       A.     Sales order processing
       B.     Invoicing
       C.     Financial analysis
       D.     Stock control                                                     (2 marks)

17. The network topology where each network component is physically connected to a central node such as a router, hub or switch is known as?
    A. Ring
    B. Bus
    C. Mesh
    D. Star (2 marks)

18. Which of the following is an output device?
    A. Flash disk
    B. Speaker
    C. Light pen
    D. Joystick (2 marks)

19. Data integrity is the overall accuracy, completeness, and consistency of data.
    Which of the following control measures would breach the integrity of a computer system?
    A. Putting a security guard at the entrance
    B. Fitting the system with an anti-theft device
    C. Locking the room
    D. Full access rights for all users (2 marks)

20. The networking device which links two systems using separate protocols is known as?
    A. Modem
    B. Gateway
    C. Bridge
    D. Switch (2 marks)

21. Which of the following is **NOT** a phase in software development lifecycle?
    A. System design
    B. Analysis
    C. System implementation
    D. User testing (2 marks)

22. A group of interacting or interrelated elements that act according to a set of rules to form a unified whole is called?
    A. Control
    B. Boundary
    C. Environment
    D. Feedback (2 marks)

23. Which of the following is **NOT** an information system development method?
    A. System development lifecycle
    B. Rapid application Development
    C. Data flow diagram
    D. Prototyping (2 marks)

24. Which of the following refers to the use of existing assets in some form within the software product development process?
    A. Portability
    B. Reusability
    C. Reliability
    D. Availability (2 marks)

25. The following are components of a decision support system, **EXCEPT**?
    A. Model
    B. Knowledge base
    C. System
    D. Data (2 marks)

26. Which of the following **BEST** describes a buy side e-commerce?
  A. The use of electronic communications for all business processes.
  B. An organisation using electronic media to purchase from its suppliers
  C. Any electronically mediated communication between an organisation and its stakeholders
  D. An organisation using electronic media to sell direct to its customers (2 marks)

27. Which of the following is described as the unauthorised downloading, copying, use, or distribution of software?
  A. Leasing
  B. Copyright
  C. Hacking
  D. Software piracy (2 marks)

28. What is the name of the system that responds to changes in the environment and modifies its operation?
  A. A deterministic system.
  B. An open system.
  C. A closed system.
  D. A cybernetic system (2 marks)

29. _____ are sets of inter-related procedures using Information Technology (IT) infrastructure in a business enterprise used to generate and disseminate desired information.
  A. Business information systems
  B. Strategic information systems
  C. Executive information systems
  D. Artificial intelligent systems (2 marks)

30. The following are elements of networking:
  1. Twisted pair cables
  2. Modem
  3. Microwaves
  4. Hub
  5. Fiber optics

  Which one of the following pairs is **NOT** a signal transmission medium in data communications?
  A. 1 and 5
  B. 2 and 4
  C. 1 and 3
  D. 3 and 5 (2 marks)

31. Which category of computer-based information systems is designed to increase the productivity of clerical workers and knowledge workers and enhance communication in the workplace?
  A. Decision support systems
  B. Office automation systems
  C. Knowledge work systems
  D. Management information systems (2 marks)

32. The limit that separates a system from the external environment is called?
  A. Control
  B. Process
  C. Boundary
  D. Feedback

33. The administration of conducting any business using the internet, extranet, web, and intranet is known as?
  A. e-Business.
  B. e-Health
  C. e-Education
  D. e-Commerce (2 marks)

34. The rights of the owner of information to decide how much information is to be exchanged, shared or distributed is known as?
   A. Intellectual property rights
   B. Data protection act
   C. Computer misuse
   D. Labour law (2 marks)

35. Which of the following is **NOT** a characteristic of Read Only Memory (ROM)?
   A. It is non volatile
   B. Data contained in it can only be read
   C. Its capacity can be increased
   D. It stores manufacturer's instructions (2 marks)

36. The following are benefits experienced by companies that switch to telecommuting, **EXCEPT**?
   A. Increased productivity
   B. Less travel fatigue
   C. Lower operational costs
   D. Cybersecurity issues (2 marks)

37. Which is the component that allows a computer programmer to write sets of instructions in specific programming language?
   A. Translator
   B. Loader
   C. Debugger
   D. Linker (2 marks)

38. Which of the following is **NOT** a component of system software?
   A. Device drivers
   B. Utility programs
   C. Translators
   D. Spreadsheets (2 marks)

39. Which among the following are the technologies that enable setting up a Local Area Network (LAN)?
   I. Workstations
   II. Modem
   III. Front end processor
   IV. Switch

   A. I and II
   B. I and III
   C. I and IV
   D. II and III (2 marks)

40. Besides computer power supply unit, a computer has a Complementary Metal Oxide Semiconductor (CMOS) battery.

   Which of the following statements **BEST** describes the function of CMOS battery?
   A. To maintain the time, date, hard disk and other configuration settings of a computer
   B. To set up the computer and boot the operating system
   C. To check computer hardware in order to ensure everything is working correctly
   D. To manage all of the software and hardware on the computer (2 marks)

41. The practice of sending unwanted email messages, frequently with commercial content, in large quantities is known as?
   A. Profiling
   B. Phishing
   C. Spamming
   D. Hacking (2 marks)

42. The following are methods of collecting data, **EXCEPT?**
    A. Observations
    B. Interviews
    C. Document reviews
    D. Testing (2 marks)

43. Which of the following is **NOT** a goal in information systems security?
    A. Confidentiality
    B. Availability
    C. Validation
    D. Integrity (2 marks)

44. Digital technology is taking over the average office and the average modern business in a big way, if that wasn't already obvious.
    Which of the following are major issues arising out of the growing reliance on information technology?
    I. Security threats
    II. Profitability
    III. Privacy concerns
    IV. Easily available
    A. I and II
    B. I and III
    C. II and III
    D. II and IV

45. Which of the following is an example of a database management software?
    A. Ms Access
    B. Ms Excel
    C. Ms PowerPoint
    D. SPSS (2 marks)

46. The electronic data processing system which is characterized by a system that processes data as it's collected and produces near-instantaneous output is known as?
    A. Distributed system
    B. Offline system
    C. Batch system
    D. Real-time system (2 marks)

47. Which is the software development methodology that emphasises on quick prototyping and iterative development to meet the requirements of a project?
    A. Computer aided software engineering
    B. Waterfall
    C. Rapid application development
    D. Spiral (2 marks)

48. The following are common categories of cybersecurity, **EXCEPT?**
    A. Network security
    B. Application security
    C. Back up security
    D. Disaster recovery and business continuity (2 marks)

49. Which of the following is **NOT** a type of memory?
    A. Scanner
    B. Random access memory
    C. Cache
    D. Flash disk (2 marks)

50.    Outsourcing is a business practice in which services or job functions are hired out to a third party on a contract or ongoing basis.

Which of the following is a disadvantage of outsourcing information system?
A.    Gain essential functions
B.    Security risks
C.    Cost reduction
D.    Improved focus                                                                                      (2 marks)

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**CISSE FOUNDATION LEVEL**

**COMPUTING SYSTEMS**

**MONDAY: 24 April 2023. Morning Paper.**                     **Time Allowed: 2 hours.**

**Answer ALL questions by indicating the letter (A, B, C or D) that represents the correct answer.  The paper is made up of fifty (50) multiple choice questions. Each question is allocated two (2) marks.**

1. A combination of graphics, text, sound, video and animation is known as_____.
   - A. Multiprogramming
   - B. Multifacet
   - C. Multimedia
   - D. Multiprocessing

2. Which programming language uses a compiler to convert source code to object code before execution?
   - A. High-level language
   - B. Low-level language
   - C. Assembly language
   - D. Natural language

3. The hardware device that enables multiple devices to connect to a computer network is known as?
   - A. Router
   - A. Multiplexer
   - B. Bridge
   - C. Hub

4. Microsoft Edge comes bundled with the Microsoft Windows operating system. In which category of software is it in?
   - A. System software
   - B. Translator
   - C. Web Browser
   - D. Application software

5. The name of the computer's central connectivity point, through which all other components and external peripherals connect is known as_____.
   - A. Microprocessor
   - B. System unit
   - C. Daughterboard
   - D. Motherboard

6. Which of the following statements **BEST** describes a virtual memory?
   - A. An extremely large main memory
   - B. An extremely large secondary memory
   - C. A type of computer memory that is directly accessed by the processor
   - D. A method of using the computer hard drive to provide extra memory for the computer.

7. The following features belong to word processing programs **EXCEPT?**
   - A. Paragraphs
   - B. Filter
   - C. Words
   - D. Characters

8.    Which of the following components is **NOT** a necessity in a local area network (LAN)?
       A.    Cable
       B.    Switch
       C.    Gateway
       D.    Computer

9.    Which of the following computer packages is applied in statistical analysis?
       A.    Presentation
       B.    Spreadsheet
       C.    Design
       D.    Paint

10.   A function in word processing that allows you to look for target text and change it with something else is known as_____.
       A.    Cut and paste
       B.    Find and replace
       C.    Word Art
       D.    Mail merge

11.   The following computer applications require real time processing **EXCEPT?**
       A.    Airline seat reservation
       B.    Traffic control
       C.    Payroll processing
       D.    Guided missile control

12.   **A** well-defined sequential computational technique that accepts a value or a collection of values as input and produces the output(s) needed to solve a problem is known as?
       A.    Program
       B.    Algorithm
       C.    Decision table
       D.    Flowchart

13.   Which of the following networks allows **MOST** flexibility on how devices are wired together in a network?
       A.    T-switched networks
       B.    Star networks
       C.    Ring networks
       D.    Bus networks

14.   The circuitry that directs operations within a computer's processor is known as?
       A.    Memory unit
       B.    Control unit
       C.    Arithmetic Logic Unit
       D.    Bus

15.   Which of the following term refers to the illegal access to the network or computer system?
       A.    Theft
       B.    Cracking
       C.    Social engineering
       D.    Piracy

16.   Which of the following statements **BEST** describes asynchronous transmission?
       A.    Transmission of data in which each character is a self-contained unit with its own start and stop bits and an uneven interval between them
       B.    Data transfer method which is characterised by a continuous stream of data in the form of signals
       C.    Transmission mode in which the data can flow in both directions at the same time
       D.    Mode of communication in which the bits are sent one after another without any start/stop bits or gaps between them

17.   The following are physical security controls used in computing, **EXCEPT?**
       A.    Security guard
       B.    Fence
       C.    Antivirus
       D.    Lock and key

18.    Which of the following types of information system is used in producing summary transaction data, high-volume data, and simple models?
   A.    Decision Support System (DSS)
   B.    Management Reporting System (MRS)
   C.    Executive Support System (ESS)
   D.    Transaction Processing System (TPS)

19.    The study and design of products that reduce stress and improve comfort to the user, helping increase the users' productivity is known as?
   A.    Ergonomics
   B.    Robotics
   C.    Artificial Intelligence
   D.    Computer Science

20.    Which of the following is **NOT** an information system's development methodology?
   A.    Waterfall
   B.    Rapid Application Development
   C.    Data flow diagram
   D.    Spiral

21.    Which of the following is **NOT** a good reason for outsourcing an information system in a business?
   A.    To reduce labour costs
   B.    To protect a business' intellectual property
   C.    To enable the business focus on its core business
   D.    To access experience

22.    Which one of the following is **NOT** regarded as a Computer programming language?
   A.    COBOL
   B.    DOS
   C.    FORTRAN
   D.    BASIC

23.    The name given to the last line or a paragraph printed at the top of a page is known as?
   A.    Page break
   B.    Widow
   C.    Orphan
   D.    Header

24.    A transaction processing system (TPS) is a computerised system that performs and records the daily routine transactions necessary to conduct the business.
   Which of the following is **NOT** a transaction processing system?
   A.    Budgeting systems
   B.    Payroll systems
   C.    Order processing systems
   D.    Reservation systems

25.    What is the name of a network that is partially accessed by authorised outside users such as customers or suppliers, enabling businesses to exchange information over the internet in a secure way?
   A.    Wide area network
   B.    Local area network
   C.    Intranets
   D.    Extranets

26.    Which of the following is a characteristic of an Executive Information System (EIS)?
   A.    Designed to process transactions virtually instantly
   B.    Does not tolerate mistakes
   C.    Integrates external and internal data
   D.    Connects with relevant subsystems for planning

27.    Which of the following statements **BEST** defines the role of a modem in computing?
     A.    Modem is a hardware component without which a computer cannot be connected over a network
     B.    Modem helps in stabilising the voltage
     C.    Modem is an object that increases a signal's strength, so it can travel greater distances without a loss in quality
     D.    Modem converts the analog signal into digital signal and vice-versa

28.    The following are unbound data transmission media, **EXCEPT?**
     A.    Satellite
     B.    Coaxial
     C.    Microwave
     D.    Bluetooth

29.    Which part of the Central Processing Unit (CPU) performs calculation and makes decisions.
     A.    Arithmetic Logic Unit
     B.    Alternating Logic Unit
     C.    Control Unit
     D.    Register

30.    Program Development Life Cycle (PDLC) is a process used in software engineering to manage the development of software programs.
     Which one of the following is NOT a step in program development life cycle (PDLC)**?**
     A.    Coding
     B.    Implementation
     C.    Testing
     D.    Debugging

31.    The data processing cycle consists of a series of steps where raw data (input) is fed into a system to produce actionable insights (output).
     The following are main steps in the data processing cycle, **EXCEPT**?
     A.    Collection
     B.    Preparation
     C.    Input
     D.    Documentation

32.    A security control method that defends a computer or network from outside cyber attackers by filtering out dangerous or superfluous network traffic is known as?
     A.    Firewall
     B.    Encryption
     C.    Antivirus
     D.    Password

33.    Which of the following statements **BEST** shows the importance of network configuration?
     A.    Enhances security and improves network stability
     B.    People can share information freely
     C.    Allows Anyone to connect to a computer network
     D.    Reduces the cost of laying out a computer network

34.    Which of the following is **NOT** a computer aided software engineering (CASE) tool?
     A.    Central Repository
     B.    Documentation Generators
     C.    Decision Tables
     D.    Code Generators

35.    Rapid Application Development (RAD) is focused primarily on rapid prototyping of software products, frequently iterating based on feedback, and continuously releasing updated versions of those products to the market.
     The following are strengths of RAD, **EXCEPT?**
     A.    Allows organisations to quickly and continuously improve their products
     B.    Allows teams to break down large projects into smaller, discrete, actionable tasks
     C.    Users can receive working products in less time
     D.    Requires highly skilled development team and product designers

36. The Hyper-Text Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser.

    The following are uses of HTML, **EXCEPT?**
    A. Web document Creation
    B. Responsive images on web pages
    C. Programing coding
    D. Internet navigation

37. Which of the following is **NOT** an application software?
    A. Word processor
    B. Operating system
    C. Spreadsheet
    D. Presentation

38. The software that allows individuals to use personal computers for storing and retrieving their personal information is known as?
    A. Personal assistance
    B. Word processor
    C. Spreadsheet
    D. Presentation

39. Which of the following is **NOT** an application of the computers in the home environment?
    A. Entertainment purpose, play games, watch films
    B. Keeping of personal records
    C. Internet surfing, internet browsing
    D. Computer Based Education (CBE)

40. The following are peripheral devices:
    X - Digital camera
    Y - Speaker
    Z - Hard disk

    Which of the above is/are used as an input device(s)?
    A. X only
    B. Y only
    C. X and Y only
    D. Y and Z only

41. Which of the following is **FALSE** about the Internet?
    A. Nobody owns the Internet.
    B. There is no centralised control.
    C. It is a network of computer networks.
    D. All the information available is accurate and reliable

42. What is the unit of measure of microprocessor speed?
    A. Byte
    B. Hertz
    C. Volt
    D. Watts

43. Which one of the following is **NOT** an operating system?
    A. Unix
    B. Windows
    C. Sage
    D. Linux

44. Which of the following is the function of the Windows key of the keyboard?
    A. Allows the user to abort, cancel, or close an operation.
    B. Opens the start menu
    C. Allows the user to switch between options in a program, separate documents, or web pages
    D. Halts execution of a running a program

45. Society has come to rely heavily on computers. Which of the following is a disadvantage of computers?
   A. Increases user productivity
   B. Stores vast amounts of information
   C. Helps sort, organise, and search through information
   D. Increases waste affecting the environment

46. An additional processor used in some computers to perform specialised tasks such as extensive arithmetic calculations or processing of graphical displays is known as?
   A. Duo core
   B. Multi core
   C. Multiprocessor
   D. Coprocessor

47. Which of the following is a benefit of using information communication technology (ICT) systems in a manufacturing business?
   A. Better use of resources
   B. Limited creativity
   C. High initial cost
   D. Adverse environmental issues

48. Which of the following communications network covers a geographic area such as a town, city or suburb?
   A. Virtual private network (VPN)
   B. Local area network (LAN)
   C. Metropolitan area network (MAN)
   D. Wide area network (WAN)

49. Which one of the following is a task performed by a spreadsheet software?
   A. Resource management
   B. Error detection
   C. Job scheduling
   D. Sales projection

50. Which type of processing system allows many users to share the computer resources simultaneously?
   A. Batch
   B. Offline
   C. Multiprocessing
   D. Time sharing

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**CISSE FOUNDATION LEVEL**

**COMPUTING SYSTEMS**

**MONDAY: 5 December 2022. Morning Paper.**            **Time Allowed: 2 hours.**

**Answer ALL questions by indicating the letter (A, B, C or D) that represents the correct answer. The paper is made up of fifty (50) multiple choice questions. Each question is allocated two (2) marks.**

1. The computer memory used for temporary storage of data and program is known as?
   A. RAM
   B. ROM
   C. EROM
   D. EPROM     (2 marks)

2. Which of the following statement is **TRUE** about impact printers?
   Impact printers:
   A. Are more expensive than laser printers
   B. Use optical technology
   C. Include ink jet and thermal devices
   D. Strike a ribbon against the paper to produce character images     (2 marks)

3. Which of the following is used by a typical modern computer?
   A. More than 1000 vacuum tubes
   B. Magnetic tapes
   C. LSI chips
   D. Magnetic cores     (2 marks)

4. Which one of the following **BEST** describes Microsoft Word?
   A. An operating system
   B. A processing device
   C. Application software
   D. A database system     (2 marks)

5. A computer cannot "boot" if it does not have one of the following. Which **ONE**?
   A. Compiler
   B. Loader
   C. Operating system
   D. Assembler     (2 marks)

6. Select the term that represents attempts by individuals to obtain confidential information from a computer by falsifying their identity.
   A. Phishing trips
   B. Computer viruses
   C. Phishing scams
   D. Spyware scams     (2 marks)

7. Which of the following software applications would be the **MOST** appropriate for performing numerical and statistical calculations?
   A. Database
   B. Document Processor
   C. Graphic Package
   D. Spreadsheet     (2 marks)

8.    A CD-ROM is a semiconductor memory.
      A.    TRUE
      B.    FALSE                                                                          (2 marks)

9.    A type of computer storage which stores or retains data after power goes off is known as?
      A.    Volatile storage
      B.    Non-volatile storage
      C.    Sequential storage
      D.    Direct storage                                                                 (2 marks)

10.   Which of the following refers to a small, single-site network?
      A.    LAN
      B.    WAN
      C.    PAN
      D.    MAN                                                                            (2 marks)

11.   What characteristic of read-only memory (ROM) makes it useful?
      A.    ROM information can be easily updated
      B.    Data in ROM is nonvolatile, that is, it remains there even without electrical power
      C.    ROM provides very large amounts of inexpensive data storage
      D.    ROM chips are easily swapped between different brands of computers                (2 marks)

12.   Select from the list below the three basic physical equipment categories of microcomputer hardware.
      A.    Keyboard, monitor, hard drive
      B.    System unit, input/output, memory
      C.    System unit, input/output, secondary storage
      D.    System unit, primary storage, secondary storage                                 (2 marks)

3.    Suggest the type of outsourcing **MOST** commonly used for IT equipment.
      A.    Onshore
      B.    Offshore
      C.    Up shore
      D.    Down Shore                                                                      (2 marks)

14.   Identify the first step in system development lifecycle (SDLC) framework?
      A.    Feasibility Study
      B.    Requirement Gathering
      C.    Monitoring
      D.    System Analysis                                                                 (2 marks)

15.   Which of the following is **NOT** correct model in Software Development Paradigm?
      A.    Waterfall Model
      B.    P model
      C.    Spiral Model
      D.    V model                                                                         (2 marks)

16.   Which system development model is **NOT** suitable for accommodating changes?
      A.    Prototyping
      B.    Spiral Model
      C.    Waterfall Model
      D.    Agile                                                                           (2 marks)

17.   The _____ can help you choose a product.
      A.    Office Automation System
      B.    Management Information System
      C.    Transaction Processing System
      D.    Decision support system                                                         (2 marks)

18. What is the major drawback of using RAD Model?
   A. Highly specialised and skilled developers/designers are required
   B. Increases reusability of components
   C. Encourages customer/client feedback
   D. Increases reusability of components, highly specialised and skilled developers/designers are required
   (2 marks)

19. Name the form of transaction processing in which all transactions are collected into a group and processed together.
   A. Accumulation processing
   B. Batch processing
   C. Data collection
   D. Data collection
   (2 marks)

20. Select from the list below the name of Internet service that enables a user to log on to another computer and access its public files.
   A. Telnet
   B. FTP
   C. Content streaming
   D. Instant messaging
   (2 marks)

21. Which of the following represents the application of information concepts and technology to routine, repetitive, and usually ordinary business transactions.
   A. E-commerce
   B. Transaction processing systems
   C. Management information systems
   D. Decision support systems
   (2 marks)

22. Which of the following statement is correct?
   A. Modem is a software
   B. Modem is the operating system
   C. Modem helps in stabilizing the voltage
   D. Modem converts the analog signal into digital signal and vice-versa
   (2 marks)

23. Which of the following can help you choose a product?
   A. Office automation system
   B. Management information system
   C. Transaction Processing System
   D. Decision Support System
   (2 marks)

24. Which of the following is a graphic representation of the modules in the system and the interconnection between them?
   A. System chart
   B. Structural chart
   C. Flow chart
   D. Pie chart
   (2 marks)

25. Which of the following is **NOT** one of the main components in a decision support system?
   A. Model
   B. Communication
   C. Data
   D. Dialogue
   (2 marks)

26. Select from the list below the statement that **BEST** describes Buy-side e-commerce.
   A. The use of electronic communications for all business processes.
   B. Any electronically mediated communication between an organisation and its stakeholders.
   C. An organisation using electronic media to sell direct to its customers.
   D. An organisation using electronic media to purchase from its suppliers.
   (2 marks)

27. Which of the following software development approach is **NOT** applicable to projects that demand continuous maintenance?
   A. Agile development methodology.
   B. DevOps deployment methodology
   C. Waterfall development methodology
   D. Rapid application development methodology                    (2 marks)

28. Select the type of information system that provide critical information for top management.
   A. Expert
   B. Executive
   C. Decision
   D. Managerial                    (2 marks)

29. How many arrows should come out of a decision symbol in a flowchart?
   A. 0
   B. 1
   C. 2
   D. 3                    (2 marks)

30. Which of the following methods processes data immediately after a transaction occurs?
   A. Batch
   B. Parallel
   C. Sequence
   D. Real time                    (2 marks)

31. Which information system use the information technology to develop all features in the products?
   A. Structure
   B. Strategic
   C. Systematic
   D. Statistical                    (2 marks)

32. Outsourcing is a process of collaboration between two or more parties.
   A. True
   B. False                    (2 marks)

33. Identify the correct definition for 'algorithm'.
   A. A problem
   B. A solution to a problem
   C. The steps that are taken to solve a problem
   D. The words to enter when typing                    (2 marks)

34. The payroll system in an organisation is an example of?
   A. MIS
   B. DSS
   C. ESS
   D. TPS                    (2 marks)

35. Which type of topology is best suited for large businesses which must carefully control and coordinate the operation of distributed branch outlets?
   A. Ring
   B. Local area
   C. Hierarchical
   D. Star                    (2 marks)

36. What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences?
   A. Unshielded twisted pair
   B. Optical fiber
   C. Coaxial cable
   D. Microwave                    (2 marks)

37. A collection of hyperlinked documents on the internet is known as?
    A. World Wide Web (WWW)
    B. E-mail system
    C. Mailing list
    D. Hypertext markup language                                                    (2 marks)

38. Which one of the following would breach the integrity of a system?
    A. Looking the room to prevent theft
    B. Full access rights for all users
    C. Fitting the system with an anti-theft device
    D. Protecting the device against willful or accidental damage                   (2 marks)

39. Which software prevents the external access to a system?
    A. Firewall
    B. Gateway
    C. Router
    D. Virus checker                                                                (2 marks)

40. What is the name given to the rights of the owner of information to decide how much information is to be exchanged, shared or distributed?
    A. Computer ethics
    B. Intellectual property rights
    C. Cyber law
    D. Labour law                                                                   (2 marks)

41. Consider the following:
    1. Twisted pair cables
    2. Microwaves and Satellite Signals
    3. Repeaters
    4. Analog Transmissions
    5. Fiber optics
    Which of the above is considered as signal transmission medium in data communications?
    A. (1) and (5)
    B. (1) and (2)
    C. (1) (2) and (5)
    D. (1) (2) (3) and (5)                                                          (2 marks)

42. In specific, if the systems use separate protocols, which one of the following devices is used to link two systems?
    A. Repeater
    B. Gateway
    C. Bridge
    D. Hub                                                                          (2 marks)

43. It is an act of stealing (like copying, distributing, modifying, selling) of software that is legally protected.
    A. Renting
    B. Software Piracy
    C. Copyright
    D. Hacking                                                                      (2 marks)

44. Which of the following is a main function of an electronic spreadsheet?
    A. Formulas
    B. Filing
    C. Sorting
    D. Heading                                                                      (2 marks)

45. Which memory stores startup instructions for a computer?
    A. Random access memory (RAM)
    B. Read Only Memory (ROM)
    C. Secondary memory
    D. Central processing unit (CPU)                                                (2 marks)

46.    Select from the list below a primary feature of an operating system.
       A.    Virus scanning
       B.    File management
       C.    Creating databases
       D.    Web searching                                                              (2 marks)

47.    Which of the following will **NOT** adversely affect the use of a computer?
       A.    Virus
       B.    Worm
       C.    Firewall
       D.    Trojan Horse                                                               (2 marks)

48.    Select the technology that was predominant in the third generation of computers.
       A.    Vacuum Tube
       B.    Transistor
       C.    Integrated Circuit
       D.    Very Large Scale Integrated (VLSI) Circuit                                 (2 marks)

49.    Under which of the following categories is a laptop computer classified?
       A.    Microcomputer
       B.    Minicomputer
       C.    Mainframe
       D.    Supercomputer                                                             (2 marks)

50.    Which of the following are components of the Central Processing Unit (CPU) of a computer?
       A.    Arithmetic and Logic Unit (ALU), Control Unit
       B.    Arithmetic and Logic Unit, Secondary Storage
       C.    Control Unit, Main Memory
       D.    Main Memory, Secondary Storage                                            (2 marks)

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**CISSE FOUNDATION LEVEL**

**COMPUTING SYSTEMS**

**MONDAY: 1 August 2022. Morning paper.**                    **Time Allowed: 2 hours.**

**Answer ALL questions.**                    **Each question is allocated two (2) marks.**

1.   Which of the following is not an interface for computer monitor?
     A.   DVI
     B.   IDE
     C.   VGA
     D.   HDMI

2.   Which of the following is the use of firewalls?
     A.   Block packets
     B.   Check for virus
     C.   Format disks
     D.   Control backups

3.   Which of the following determines the software that opens a file?
     A.   File size
     B.   File name
     C.   File extension
     D.   Date modified

4.   A device that connects networks of different protocols is known as
     A.   Router
     B.   Bridge
     C.   Switch
     D.   Hub

5.   Which of the following network configuration tool addresses the devices directly?
     A.   GUI
     B.   Menu Driven
     C.   CLI
     D.   Keyboard

6.   Which of the following is not a threat to data?
     A.   Worm
     B.   Phishing Software
     C.   Firmware
     D.   Malware

7.   Identify a software tool suitable for prototyping
     A.   MS Access
     B.   MYSQL
     C.   MS SQL Server
     D.   JAVA

8.      Identify a data type used to store average data of a field
        A.      Integer
        B.      Float
        C.      Array
        D.      String


9.      Which of the following health issue is caused by technology?
        A.      Measles
        B.      Malaria
        C.      Eye strain
        D.      Corona


10.     Which of the following method of data processing is suitable for reservation systems?
        A.      Offline
        B.      Online
        C.      Real time
        D.      Batch


11.     Which process of SDLC can occur at any stage of system development?
        A.      Testing
        B.      Implementation
        C.      Analysis
        D.      Documentation


12.     Choose the fastest transmission media
        A.      Twisted pair
        B.      Optic fiber
        C.      Air
        D.      Two pair cable


13.     Which is the reason for outsourcing ICT services?
        A.      Security
        B.      Speed
        C.      Scalability
        D.      Accuracy


14.     Which of the following is the latest feature to be included in ICT systems?
        A.      Artificial intelligence
        B.      Transistors
        C.      Large scale integration
        D.      VLSI

15.     Choose the most important use ICT in schools
        A.      Communication
        B.      Meetings
        C.      Storage
        D.      Lesson Presentation

16.     Identify the system that provides the most summarised report
        A.      Transaction processing system
        B.      Executive Information system
        C.      Management Information Systems
        D.      Decision support information system

17. A user who helps others when they are not able to use computers is called_____?
    A. User support analyst
    B. Engineers
    C. Systems administrators
    D. Database administrators

18. Which of the following was not an impact of COVID 19 pandemic on ICT?
    A. Online meeting
    B. Online classroom
    C. Increased productivity
    D. Online support

19. Evaluate the following statement as TRUE or FALSE "Computers have reduced in size over time"
    A) TRUE
    B) FALSE

20. Evaluate the following statement as TRUE or FALSE "In rapid application development two programmers work in one work station"
    A) TRUE
    B) FALSE

21. Which of the following is a keying in device?
    A. Mouse
    B. Concept keyboard
    C. Touch screen
    D. Touch pad

22. Which of the following NOT a criterion for classifying computer?
    A. Size
    B. Generation
    C. Purpose
    D. Cost

23. Identify a utility software
    A. Word
    B. Excel
    C. Kaspersky
    D. Access

24. Identify a low-level language from the list?
    A. Assembly
    B. Pascal
    C. C
    D. Java

25. What will the following statement evaluate: true and false evaluate to?
    A. True
    B. False
    C. Null
    D. Void

26. Conversion of high-level code to machine language line by line is called?
    A. Compilation
    B. Interpretation
    C. Coding
    D. Encoding

27.    A system used by a clerk in an organisation is?
       A.    Executive support system
       B.    Artificial intelligence
       C.    Transaction processing system
       D.    Decision support

28.    A type of data processing used by an organization for processing salaries is best referred to as?
       A.    Online
       B.    Batch processing
       C.    Real time
       D.    Offline

29.    A device that connects other computers to a WIFI network is called?
       A.    Access point
       B.    Router
       C.    Switch
       D.    Hub

30.    Which of the following is the best example of e-governance?
       A.    Checking exams results online
       B.    Tweeting a friend
       C.    Applying for passports online
       D.    Applying police abstract using paper form

31.    Which of the following is **NOT** a softcopy output device?
       A.    Printer
       B.    LED
       C.    Speaker
       D.    Monitor

32.    Which of the following software is installed before a new device can be useable?
       A.    Buffer
       B.    Drivers
       C.    Application
       D.    CMOS

33.    _____is a  computer memory used for temporary storage of data and program.
       A.    RAM
       B.    Flash disk
       C.    EROM
       D.    Hard disk

34.    The first step in system development lifecycle is?
       A.    Feasibility Study
       B.    Requirement Gathering
       C.    Planning
       D.    System Analysis

35.    The problem associated with waterfall model is?
       A. Slow speed of implementation
       B. The project is Complex
       C. Does not accommodate changes
       D. Projects maintenance is difficult

36.    Evaluate the following statement "Software outsourcing is a process of collaboration between two or more parties with common interest". Is it true or false?
       A)    True
       B)    False

37. Choose the most appropriate statement that describes impact printers?
    A. They are fast
    B. Use optical technology
    C. Uses thermal devices
    D. Strike an inked ribbon against a paper to produce characters.

38. _____tool is a software package that provides support for the design and implementation of information systems.
    A. Python
    B. CASE
    C. LISP
    D. JAVA

39. The following technology was used by fourth generation computers?
    A. Transistors
    B. Vacuum tubes
    C. LSI chips
    D. Magnetic cores

40. Notepad is an example of a _____ software
    A. Operating system
    B. Application Software
    C. Word processor
    D. Input device

41. The most appropriate application software for performing numerical and statistical calculations is?
    A. Document Processor
    B. Python
    C. Database
    D. Spread Sheet

42. A small single-site network in an organisation is called?
    A. LAN
    B. WAN
    C. Internet
    D. Blue tooth

43. Which of the following storage devices uses small magnets to store data?
    A. Flash disks
    B. DVD
    C. Hard disk
    D. CDROM

44. In program execution, _____ converts and executes a whole program
    A. Compiler
    B. Interpreter
    C. Converter
    D. Instructions

45. A collection of webpages is called _____
    A. Server IP
    B. Web browser
    C. DNS server
    D. Web site

46. Any software that prevents a computer system from achieving its performance is called?
   A. System infectors
   B. Malware
   C. Linkers
   D. Boot infectors

47. Choose the one that is odd one out.
   A. Monitor
   B. Keyboard
   C. Webcam
   D. Mouse

48. What is the name given to programs stored in ROM chips?
   A. Hardware
   B. Firmware
   C. Freeware
   D. Software

49. Which of the following is the problem of using ICT for entertainment?
   A. Variety
   B. Readily available
   C. Addiction
   D. Low cost

50. Which of the following is **NOT** a data pre-processing method?
   A. Data Visualization
   B. Data Discretization
   C. Data Cleaning
   D. Data Reduction

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INSTRUCTIONS TO CANDIDATES
Answer all questions
Select correct answers in the questions below

1. Which of following technologies was used in the first generation of computers?
   **a.  Vaccum tubes and magnetic drum**
   b.  Integrated circuits
   c.  Magnetic tape
   d.  Transistors

2. The series of repeatable steps taken by a team to achieve business goal is known as?
   a.      Business intelligence
   **b.      Business process**
   c.      Quality process
   d.      Business process re-engineering

3. Choose a programming language that is in the category of low level
   a.  Procedural language
   **b.  Assembly language**
   c.  Machine language
   d.   Logic programming

4. In which layer of the client computing architecture does the business logic lie?
   a.  1$^{st}$ Tier
   **b.  2$^{nd}$ Tier**
   c.  3$^{rd}$ Tier
   d.  4$^{th}$ tier

5. Which of the following data processing mode is suitable for data that is required for immediate decision making?
   a.  Batch processing
   b.  Electronic data processing
   **c.  Realtime processing**
   d.  Multiprocessing

6. Which of the following is used to link devices of different topology?
   a.  Switch
   **b.  Router**
   c.  Hub
   d.  Modem

7. Which of the following is **NOT** a task in system analysis stage of system development life cycle?
   a.  Decomposition
   b.  Problem formulation
   c.  Creating functional requirements.
   **d.  Creating flowcharts**

8.  Which of the following is stored in flash memory chip?
    a.  **BIOS**
    b.  Operating system
    c.  Compiler
    d.  Application software
9.  In which category does android software belong?
    a.  Application software
    b.  Firm ware
    c.  **Operating system**
    d.  Kernel.
10. Choose the layer in which Simple Mail Transfer Protocol (SMTP) is found in the TCP/IP protocol?
    a.  Transport layer
    b.  Internet layer
    c.  Network layer
    d.  **Application layer**
11. Select from the following a set of processes and procedures that transform data into information.
    a.  **Information system**
    b.  Knowledge system
    c.  Expert system
    d.  Operating system
12. Which of the following computers will be the most appropriate for intensive mathematical and scientific application?
    a.  Mainframe computers
    b.  **Super computers**
    c.  Hybrid computers
    d.  Mini computers
13. Which of the following programming languages is an Object-Oriented programming language?
    a.  Pascal
    b.  LISP
    c.  **JAVA**
    d.  C
14. Which of the following is **NOT** a technological impact of Covid-19 lock down?
    a.  Increased eLearning
    b.  Innovation
    c.  More use of video conferencing
    d.  **Closure of schools**
15. Which of the following is used to design computer programs?
    a.  **Flowchart**
    b.  Loader
    c.  Editor
    d.  Debugger
16. Identify the challenges of ring topology in a network.
    a.  Complexity
    b.  **Any node failure affects the entire network**
    c.  Expensive
    d.  Insecure.
17. What is the name given to a document used when a company goes outside its organization to develop a new system?
    a.  Request for expression of interest
    b.  Request for invoice
    c.  **Request for proposal**
    d.  Request for comments
18. What is equivalent of 5KB into bytes?
    a.  1000 bytes
    b.  5000 bytes
    c.  **5120 bytes**
    d.  40 bytes

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19. Which of the following is a programming methodology?
    a. **Event driven**
    b. Design
    c. Analysis
    d. Coding
20. Which of the following is **NOT** an ethical concern in computer networking?
    a. **Hardware failure.**
    b. Hacking
    c. Tapping
    d. Copyright
21. Which of the following is an advantage of programming using low level languages?
    a. Easy to learn
    b. Portable
    c. **Fast processing**
    d. Compatibility
22. Which of the following determines the speed of a computer?
    a. **Bus width**
    b. Manufacturer
    c. Motherboard
    d. Software.
23. Identify an input device captures data directly from the source
    a. Keyboard
    b. Mouse
    c. **Optical character recognition**
    d. Touch screen
24. Which part of the motherboard allows users to add new devices and capabilities to a computer system?
    a. **Expansion slots**
    b. Sockets
    c. Ports
    d. Chipset
25. Which of the following is a short-range wireless connectivity technology?
    a. WIFI
    b. Satellite
    c. **Bluetooth**
    d. Microwave
26. Which of the following statements correctly defines Sequential file organization technique?
    a. **Method of storing records in contiguous blocks according to a key**
    b. Storing records sequentially but using an index to locate records
    c. Using an index for each key type
    d. Having records placed randomly throughout the file
27. Which of the following is **NOT** used in a Local Area Network?
    a. Computer
    b. **Frame-Relay.**
    c. Router
    d. Logical Address
28. Which of the following is **NOT** a system investigation technique?
    a. Surveys
    b. Observation
    c. Review previous studies
    d. **Consultation**
29. A compiler is used to convert the source code written in mnemonics into object code.
    a. True
    b. **False**
30. Software that prevents unauthorized access to a network located between a private network and an outer network on the Internet restricting Internet traffic in, out or within a private network is referred to as?
    a. Firmware
    b. **Firewall**
    c. Antivirus
    d. Malware

31. What is the name given to the mechanism of protecting critical systems and sensitive information from digital attacks?
    a. Protection
    b. Encryption
    c. Decryption
    **d. Cybersecurity**
32. Which of the following is an example of a control structure?
    a. Arrays
    b. Lists
    **c. For loop**
    d. Vector
33. Given that x=2, what is the answer expected from x>5?
    a. True
    **b. False**
    c. Yes/No
    d. 0/1
34. Which of the following is the first to be done to a variable?
    **a. Declaration**
    b. Inputting
    c. Outputting
    d. Processing
35. Choose the location where a programmer may **NOT** choose to store program data.
    a. Text files
    b. Databases
    c. Memory
    **d. ROM**
36. Match the programs with their functions

| Program | Function |
|---|---|
| Swift | Mobile programming |
| Ruby | Management software interface |
| Visual basics | Game programming |

    a. C-> y, E->z, d->y
    **b. C->x,d->z,e->y**
    c. C->z,d->x,e->y,
    d. x->C,d->z,e->y
37. Which of the following is the smallest piece of information in data processing?
    a. 6 bits
    b. Byte
    **c. Nibble**
    d. Word
38. Which of the follow technology provides the fastest secondary storage?
    a. Magnetic storage
    b. Optical storage
    c. DIMM
    **d. Flash memory**
39. Which of the following is **NOT** a type of software testing?
    a. Smoke
    **b. Troubleshooting**
    c. Beta
    d. Integration

40. Choose the name of the software produced by a proprietary company when testing software.
    a. Open source
    **b. Freeware**
    c. Proprietary
    d. End user agreement
41. Which of the following technologies was the first to be widely affected by ICT technology?
    **a. Mailing**
    b. Welding
    c. Weather forecasting
    d. Mineral exploitation
42. Below are reasons why companies create new programming languages, which one is not?
    a. Better performance
    **b. Increase development costs**
    c. Security of their software
    d. To fit their needs
43. Which of the following is the role of a database administrator in an organization?
    a. Debugging
    **b. Set and maintain database standards**
    c. Creating database programs.
    d. Designing software application
44. Why do organizations opt for tailor made software instead of off the shelf software?
    **a. Precise requirements**
    b. Better documentation
    c. Less errors
    d. Costs less
45. What is the danger of locating an organization server on a cloud location?
    a. Availability
    **b. Security**
    c. Performance
    d. Elasticity
46. Which of the following is **LEAST** likely to be caused by using a computer?
    a. Backache
    b. Strain Injury
    c. Eye problems
    **d. Hearing problems**
47. Which of the following command is used in network troubleshooting?
    a. Dir
    b. Chdir
    c. apipa
    **d. ping**
48. Which of the following is a CASE tool?
    **a. Diagramming tool**
    b. MYSQL
    c. Word processor
    d. Corel draw
49. Which of the following tool is the most suitable for prototyping?
    a. Oracle
    b. JAVA
    **c. Visual Basic**
    d. C++
50. Which of the following is the **MAJOR** concern among parents on ICT?
    a. Time saving
    **b. Cyber bullying**
    c. Loss of gadgets
    d. Expenses

51. Which level of management uses decision support systems?
   a. Transaction managers
   b. Supervisors
   **c. Strategic managers**
   d. Users
52. Which of the following is a part of an expert system?
   **a. Inference engine**
   b. An expert
   c. A database
   d. Kernel
53. Which of the following is **NOT** a type of programming error?
   a. Logical
   b. **Bug**
   c. Syntax
   d. Run-time
54. The process of contracting a certain project or an entire business task to an external service provider that specializes in the service is called_____.
   a. insourcing
   b. self-sourcing
   c. sourcing
   d. **outsourcing**
55. Select the type of information system that stores knowledge from a specific domain
   a. **Expert system**
   b. Decision Support System
   c. Knowledge Worker System
   d. Management of Information System
56. Which one of following is a characteristic of Online Analytical Processing (OLAP)?
   a. It allows both read and write operation
   b. **It allows only read and hardly write operations**
   c. OLTP employs traditional DBMS
   d. It holds current operational data
57. Select the application that is used at the operational level of an information system
   a. **Payroll system**
   b. Logistics systems
   c. Group decision support systems
   d. Budgeting systems
58. Which of following is **NOT** a problem-solving tool in programming?
   a. Decision tree
   b. Decision table
   c. Algorithm
   d. **Pivot tables**
59. A graphical representation of an algorithm is known as a?
   a. Work flow diagram
   b. **Flowchart**
   c. Pixel
   d. Pseudocode
60. The translator that coverts source code written in a high-level language to the object code by translating all the code at once is called?
   a. Assembler
   b. Loader
   c. Interpreter
   d. **Compiler**

61. _____ is the programming paradigm that focuses on the logic of computation while neglecting the control.
    a. **Declarative**
    b. Imperative
    c. Procedural
    d. Object-oriented

62. Select the name of the condition caused by excessive use of the computer causing a series of eye problems due to staring at the monitor of a computer for a long period of time.
    a. Repetitive Strain Injury
    b. Carpal Tunnel Syndrome
    c. **Computer Vision Syndrome**
    d. Blindness

63. Select the type of testing that takes place at the end users' site by the end users to validate the usability, functionality and compatibility of software.
    a. Unit testing
    b. Stress testing
    c. **Beta testing**
    d. Alpha testing

64. The problem-solving technique, that is concerned with the breaking down a task into smaller manageable tasks that are easier to debug is referred to as?
    a. Abstraction
    b. **Decomposition**
    c. Module
    d. Algorithm

65. Which programming control structure is used for executing repetitive statements in programming?
    a. **Iteration**
    b. Recursion
    c. Selection
    d. Sequential

66. The study of the sitting posture when using computers is known as?
    a. Egocentric
    b. Gymnastic
    c. Econometric
    d. **Ergonomics**

67. The application area of computing that tries to mimic the reasoning of a human being in problem solving is known as?
    a. Virtual reality
    b. **Artificial intelligence**
    c. Augmented reality
    d. Machine learning

68. The system program that takes the object code of a program as input and prepares it for execution is called?
    a. Compiler
    b. Debugger
    c. **Loader**
    d. Linker

69. Which of the following can cause eye strains when using computers monitors?
    a. Use of antiglare screen
    b. **Using computers with flickers**
    c. Use a wrist rest
    d. Using adjustable chairs

70. Which of the following is the correct steps for program life cycle?
    a. Analysis- Coding -Design- Testing-Maintenance
    b. **Analysis-Design-Coding-Testing-Maintenance**
    c. Analysis-Design- Maintenance -Coding-Testing
    d. Analysis- Maintenance -Design-Coding-Testing

71. Working from a location other than an office using modern technology and telecommunications to remain in touch with your employer is called?
    a. Teleconferencing
    b. Outsourcing
    c. **Telecommuting**
    d. Teamworking

72. The diagram below represents a typical computer network.
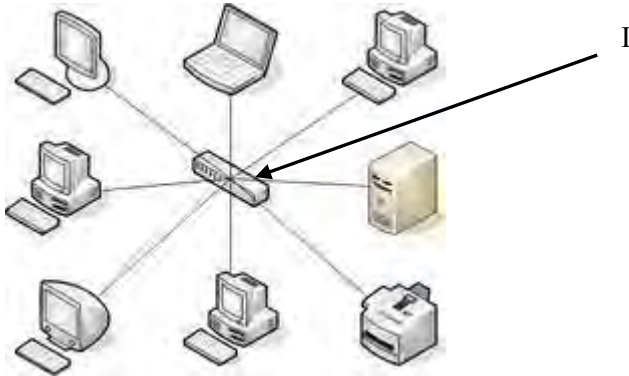


Suggest the name of the part labeled I on the diagram.

   a) Controller
   b) Node
   c) Bus
   **d) Hub**

**73.** The following is a list of disadvantages of a Star topology. Which one is **NOT**?
   **a) Not easy to extend the network**
   b) Expensive to install
   c) Extra hardware is required adding to the cost.
   d) Requires more cable

74. Match each of the following types of computer files with their corresponding descriptions

|     | Type of File    |   | Description                                          |
|-----|-----------------|---|------------------------------------------------------|
| I   | **Ordinary File**   | W | File used by the system for executing processes in some order |
| II  | **Directory file**  | X | File created by a user                               |
| III | **Special File**    | Y | File stored into a particular folder                 |
| IV  | **FIFO File**       | Z | File necessary to run a computer system              |

a) I -W, II -X, III -Y, IV-Z

**b) I-X, II -Y, III -Z, IV -W**       √

c) I -Z, II -Y, III -X, IV-W

d) I -Y, II -W, III -X, IV -Z

75. When is it necessary to use rapid application development method of information system development in an organization?

   a) When there is no need to encourage customer feedback
   b) When there is no need of increasing reusability of components
   c) When there is scarcity of qualified designers.
   **d) When the system is required in a short duration**

75. Given below are importance of Online Analytical Processing (OLAP) in a business data warehouse. Which one is **NOT**?
   a) Finding some clusters and outlier data is easy
   **b) It avoids analyzing time series data which is not necessary to a business**
   c) Provides building blocks for business modeling tools
   d) Quickly create and analyze 'what if' scenarios.

76. Below is a list of drawbacks of mobile commerce. Which one is NOT?
   a) Data privacy concerns
   b) Internet connectivity
   c) Shipping costs
   **d) Size of the gadget**

77. Information technology raises a number of legal and ethical issues. Which among the following is a legal issue raised by information technology?
   a) Access right
   b) Personal privacy
   c) Trade Secrets
   **d) Data protection**

78. The following is a list of types of decision support system. Which one is **NOT**?
   a) **Menu-driven**
   b) Communication-driven
   c) Data-driven
   d) Knowledge-driven

79. Information and communication technologies (ICT) have impacted entertainment and leisure activities in different ways. Choose one entertainment and leisure activity from the list below.
   a) **Video production**
   b) Video conferencing
   c) News editing
   d) Swimming lessons

80. Which of the following types of file correctly matches with its corresponding application software
   a) Kasneb.xlsx - Microsoft Text
   **b) Kasneb.txt - Notepad**
   c) Kasneb.pdf – Microsoft PowerPoint
   d) Kasneb.pptx -Microsoft publisher

81. Which of the following is **NOT** an arithmetic operator in programming?
   **a. ==**
   b. >=
   c. >
   d. =

82. What is the result of the operation 5%2
   a. Invalid
   b. 0
   c. 2.5
   **d. 1**

83. Which of the following stores historical data?
    a. Database
    b. Operational data
    **c. Data warehouse**
    d. Online database
84. Which of the following is NOT a system software?
    a. Utility
    b. Operating system
    **c. Spreadsheet**
    d. Language translator
85. A business professional who uses analysis and design techniques to solve business problems by using information technology and requires more in-depth technical knowledge is called?
    a. Business analyst
    **b. System analyst**
    c. Programmer
    d. System Programmer

86. Which of the following is proprietary Operating System?
    a. UNIX
    b. Android
    **c. Windows**
    d. CENTOS
87. In a computer architecture, a bus is a group of wires that connects different components of the computer. Which of the following is a computer bus?
    **a. Control**
    b. Register
    c. Link
    d. Width
88. Computing system can be used as more general term to describe a system that is used to solve problems and interact with the environment. Which of the following is NOT a component of the computing system?
    a. Procedures
    b. Orgware
    c. Data
    **d. Reports**
89. _____is a diagram that depicts the interactions between the system and external system users
    **a. Use-case**
    b. Activity diagram
    c. Flowchart
    d. UML
90. The technology that superimposes information such as text, image, sound on the real world and enhances a part of the user's physical world with computer-generated digital information is known as?
    a. Virtual Reality
    b. Computer Graphics
    **c. Augmented Reality**
    d. Animation
91. A type of software that is burnt into a hardware is called?
    a. Operating system
    **b. Firmware**
    c. Freeware
    d. Shareware
92. The natural counting numbers are to base?
    **a. 10**
    b. 2
    c. 8
    d. 7

93. A network device that **BEST** broadcasts information to the correct network segment is called?
    a. **Switch**
    b. Hub
    c. Bridge
    d. Router
94. Which of the following is the main shortcoming of outsourcing ICT services?
    a. Speed
    b. Location
    c. Performance
    d. **Data security**
95. Identify the correct statement about information systems
    a. **Different information systems types are used by different levels of management**
    b. All parts of an information system are used by any group of users
    c. All information can be stored in any location.
    d. Security is more important that access in a system
96. Which of the following application does **NOT** use artificial intelligence?
    a. Robotics
    b. Face recognition
    c. Natural language processing
    d. **Smart card authentication**
97. Consider the code below

    While (i<=5){
    x=x+2

    print i
    }
    If x is 3, what is the output?
    a. **5,7**
    b. 3,5
    c. None
    d. 3,3
98. Which of the following displays has the LEAST favourable output?
    a. Gas plasma
    b. **Cathode Ray Tube**
    c. Light Emitting Diode
    d. Liquid Crystal Display
99. Identify the address that is inbuilt in a physical computing device?
    a. IP address
    b. Routing table
    c. **MAC address**
    d. Subnet mask
100. Which of the following is the **MOST** effective method of securing organization data?
    a. Employing watchmen
    b. **Using firewalls**
    c. Using identification badges
    d. Using grills on doors