BUN

PROVISIONAL ANSWER KEY

Name of the post	**Assistant Professor, Computer Science in Government Arts, Science & Commerce College, GES, Class-2 (Special Recruitment-PwD-Second Attempt)**
Advertisement No.	**85/2025-26**
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THE LINK FOR ONLINE OBJECTION SYSTEM WILL START FROM 30-06-2026; 11:00 AM ONWARDS

Instructions / સૂચના

Candidate must ensure compliance to the instructions mentioned below, else objections shall not be considered: -

(1) Candidates have to pay fees of Rs.100/- for each objection. The fees can be paid from the link given herewith.

(2) The Candidate will be able to submit objection only after payment of the fees. The generation of the receipt will only be considered as final submission.

(3) The Candidate must retain the receipt of the payment of the fees. The fees, once paid, will not be refunded under any circumstances.

(4) All the objections should be submitted through **ONLINE OBJECTION SUBMISSION SYSTEM** only. Physical or submission through any other means will not be considered.

(5) All objections are to be submitted with reference to the Master Question Paper published with provisional answer key, published herewith on the website / online objection submission system. Objections should be sent referring to the Question No. & options of the Master Question Paper. Objections regarding question nos. and options other than provisional answer key (Master Question Paper) shall not be considered.

(6) Objections and answers suggested by the candidate should be in compliance with the responses given by him in his answer sheet. Objections shall not be considered, in case, if responses given in the answer sheet /response sheet and submitted objections are differed.

(7) Supportive document to the objection must be uploaded, without which objection will not be considered.

(8) Objections must be supported by authentic references or documentary evidence. Objections based solely on Al, GPT, or similar tools without supporting evidence shall not be considered. For calculation-based, mathematical, statistical, or reasoning questions, candidates shall provide the relevant calculation, methodology, or logical basis in support of the objection.

ઉમેદવારે નીચેની સૂચનાઓનું પાલન કરવાની તકેદારી રાખવી, અન્યથા વાંધા-સૂચન અંગે કરેલ રજૂઆતો ધ્યાને લેવાશે નહીં

(1) ઉમેદવારે દરેક વાંધા દીઠ રૂપિયા ૧૦૦/-ફી ભરવાની રહેશે. જે ફી આ સાથે આપેલ લીંક ઉપરથી ભરી શકાશે.

(2) ફી ભર્યા બાદ જ વાંધો સબમીટ થઈ શકશે. ફી ભર્યાની આખરી પહોંચ જ આખરી સબમીશન ગણાશે.

(3) ફી ભર્યાની પહોંચ ઉમેદવારે સાચવી રાખવાની રહેશે. એક વાર ભરેલ ફી કોઈ પણ પરિસ્થિતિમાં પરત આપવામાં આવશે નહિ.

(4) વાંધા ફક્ત **ઓનલાઈન ઓબ્જેકશન સબમીશન સીસ્ટમ** દ્વારા જ સબમીટ કરવાના રહેશે. રૂબરૂ, ટપાલ અથવા ઈ-મેઈલ કે અન્ય કોઈ રીતે આયોગને મોકલવામાં આવેલ વાંધા ધ્યાને લેવામાં આવશે નહીં, જેની ખાસ નોંધ લેવી.

(5) ઉમેદવારે પોતાને પરીક્ષામાં મળેલ પ્રશ્નપુસ્તિકામાં છપાયેલ પ્રશ્નક્રમાંક મુજબ વાંધા-સૂચનો રજૂ ન કરતાં, તમામ વાંધા-સૂચનો વેબસાઈટ પર પ્રસિધ્ધ થયેલ પ્રોવિઝનલ આન્સર કી(માસ્ટર પ્રશ્નપત્ર) ના પ્રશ્નક્રમાંક મુજબ અને તે સંદર્ભમાં રજૂ કરવા. માસ્ટર પ્રશ્નપત્રમાં નિર્દિષ્ટ પ્રશ્ન અને વિકલ્પ સિવાયના વાંધા ધ્યાને લેવામાં આવશે નહીં.

(6) ઉમેદવારે પ્રશ્નના વિકલ્પ પર વાંધો રજૂ કરેલ છે અને વિકલ્પ રૂપે જે જવાબ સૂચવેલ છે એ જવાબ ઉમેદવારે પોતાની ઉત્તરવહીમાં આપેલ હોવો જોઈએ. ઉમેદવારે સૂચવેલ જવાવ અને ઉત્તરવહીનો જવાબ ભિન્ન હશે તો ઉમેદવારે રજૂ કરેલ વાંધા ધ્યાને લેવાશે નહીં.

(7) વાંધા માટે સંદર્ભ જોડવો આવશ્યક છે, જેના વિના વાંધો ધ્યાને લેવામાં આવશે નહીં.

(8) વાંધો પ્રમાણભૂત અને અધિકૃત સંદર્ભો અથવા દસ્તાવેજી પુરાવાથી સમર્થિત હોવો આવશ્યક છે. માત્ર AI, GPT અથવા સમાન સાધનો દ્વારા જનરેટ કરાયેલ અને આધારભૂત પુરાવા વિનાના વાંધાઓની વિચારણા કરવામાં આવશે નહીં. ગણતરી આધારિત, ગાણિતિક, આંકડાશાસ્ત્રીય અથવા તાર્કિક પ્રશ્નોના કિસ્સામાં ઉમેદવારે સબંધિત ગણતરી, પદ્ધતિ અથવા તાર્કિક આધાર રજૂ કરવાનો રહેશે.

Website link for online objection submission system: https://www.formonline.co.in/GPSC_TRACK/SearchPage.aspx

Q1. A data center is described as a critical infrastructure supporting digital systems. Which of the following is the most fundamental purpose of a data center?

A. A facility exclusively designed for internet browsing
B. A centralized facility housing IT equipment for processing, storing and transmitting digital data
C. A system used only for cloud computing services
D. A network device used for communication routing only

Q2. The rapid growth of data centers is attributed to multiple factors,which of the following is related to this growth trend?

A. Reduction in internet usage worldwide
B. Increased dependency on physical data storage
C. Expansion of digital communication, internet usage, and demand for large-scale data storage
D. Decline in business reliance on IT systems

Q3. Which of the following is the best explanation for why energy efficiency is critical in data center operations?

A. Energy costs are negligible in data center operations
B. Data centers consume minimal electricity compared to other industries
C. High energy consumption directly impacts operational costs and sustainability
D. Energy consumption does not affect cooling systems

Q4. Which of the following areas is NOT explicitly addressed in the TIA-942 standard for data center design?

A. Cabling infrastructure
B. Site layout and reliability
C. Employee salary structures
D. Environmental considerations

Q5. Power distribution in a data center involves multiple components.What is the role of a UPS system in it?

A. It increases network bandwidth
B. It acts as backup power and prevents disruptions during outages
C. It reduces cooling requirements
D. It converts digital signals into analog signals

Q6. Why are thermal management systems considered critical in the operational efficiency of modern data centers?

A. Temperature control systems require very little electrical power
B. Heat generation from computing infrastructure has no impact on facility operations
C. Environmental control and cooling infrastructure account for a significant portion of power usage because of heat produced by servers and networking equipment.
D. Data centers can operate reliably without dedicated cooling mechanisms

Q7. Which of the following best defines blockchain in the context of digital systems?

A. A centralized database controlled by a single authority
B. A distributed ledger that records transactions across multiple nodes securely
C. A type of cloud storage system
D. A programming language for financial applications

Q8. Hash cryptography is a fundamental component of blockchain systems. Which of the following best describes its primary purpose?

A. To store large volumes of data
B. To encrypt and secure data by converting it into fixed-length outputs
C. To increase internet speed
D. To replace network protocols

Q9. Immutability is a key feature of blockchain technology. Which of the following best explains this concept?

A. Data can be easily modified by users
B. Transactions can be deleted at any time
C. Once recorded, data cannot be altered without consensus
D. Data is stored temporarily

Q10. Blockchain operates on a distributed peer-to-peer (P2P) network. What is the main advantage of this architecture?

A. Centralized control of data
B. Reduced transparency
C. Elimination of intermediaries and increased system resilience
D. Limited scalability

Q11. Mining is a crucial process in blockchain systems. Which of the following best describes its function?

A. Storing user data
B. Validating transactions and adding them to the blockchain
C. Encrypting network traffic
D. Managing cloud storage

Q12. Consensus protocols ensure agreement among blockchain participants. Which of the following is a widely used consensus mechanism in blockchain systems?

A. HTTP
B. Proof of Work
C. FTP
D. DNS

Q13. Blockchain applications are expanding across industries. Which of the following represents a valid application area of blockchain technology?

A. Only banking sector
B. Only gaming industry
C. Supply chain, healthcare, and voting systems
D. Only social media

Q14. What is the meaning of decentralization in blockchain?

A. Control by a single authority
B. Data stored only on one server
C. Distribution of control across multiple nodes without a central authority
D. Limited access to users

Q15. Which of the following best describes the rational agent approach to artificial intelligence?

A. Designing systems that exactly mimic human thought processes
B. Building systems that act to achieve the best expected outcome based on available information
C. Creating systems that replicate human emotions and behaviour
D. Developing machines that pass the Turing Test exclusively

Q16. Which of the following is a requirement for a system to pass the standard Turing Test?

A. It must physically resemble a human
B. It must outperform humans in mathematical tasks
C. It must generate responses indistinguishable from a human in conversation
D. It must learn without supervision

Q17. Problem-solving agents operate by searching through a state space. Which of the following is the correct difference between uninformed and informed search strategies?

A. Uninformed search uses heuristics, while informed search does not
B. Informed search uses domain-specific knowledge to guide exploration, while uninformed search does not
C. Uninformed search guarantees optimal solutions, while informed search does not
D. Both are identical except for implementation

Q18. Constraint Satisfaction Problems (CSPs) are widely used in AI. Which of the following is the correct purpose of constraint propagation techniques?

A. To eliminate variables from the problem
B. To reduce the search space by enforcing consistency among variables
C. To convert CSPs into optimization problems
D. To increase computational complexity

Q19. Which of the following best describes the role of model checking in propositional logic used within AI?

A. To generate new symbols automatically
B. To verify whether a given sentence is true in a particular model
C. To simplify logical expressions
D. To replace theorem proving methods

Q20. First-order logic extends propositional logic. Which of the following best describes its main advantage in AI applications?

A. It eliminates variables entirely
B. It allows representation of objects, relations, and quantification
C. It simplifies all logical expressions
D. It requires no inference mechanisms

Q21. Bayesian networks are widely used for probabilistic reasoning. Which of the following best describes their primary advantage?

A. They eliminate uncertainty in reasoning
B. They represent probabilistic relationships among variables in a structured graphical form
C. They replace logical inference completely
D. They require no prior knowledge

Q22. Which of the following correctly describes supervised learning?

A. Learning without labelled data
B. Learning through interaction with the environment only
C. Learning a mapping from inputs to outputs using labelled examples
D. Learning by random exploration

Q23. Which of the following best explains the core principle of reinforcement learning?

A. Learning by memorizing datasets
B. Learning by receiving labelled examples
C. Learning through rewards and penalties based on actions
D. Learning through logical inference only

Q24. Which of the following best matches the definition of "a collection of autonomous computers connected by a communication technology"?

A. A single powerful computer running multiple programs simultaneously
B. Multiple computers connected in such a way that they can exchange information regardless of physical medium
C. A group of computers sharing a common operating system appearing as a single entity
D. A centralized computing system where users access a mainframe

Q25. The concept of resource sharing is central to business applications of computer networks. Which of the following scenarios best demonstrates this principle?

A. Each employee having a dedicated private printer
B. A centralized server storing company data accessible by employees across locations.
C. Independent computers performing isolated tasks
D. Using offline storage devices for data transfer

Q26. Which of the following correctly describes the client-server model in networking?

A. Servers continuously broadcast data without client interaction
B. Clients send requests and servers respond with the requested data or services
C. Clients and servers perform identical functions simultaneously
D. Servers only store data and never process requests

Q27. Which of the following best characterizes a peer-to-peer system?

A. A system with a central database and dedicated server
B. A hierarchical structure with strict roles
C. A decentralized system where each participant can act as both client and server
D. A system limited to small-scale local networks

Q28. Which of the following is an example of a consumer-to-consumer (C2C) application?

A. A company purchasing raw materials from a supplier
B. A government providing online tax forms
C. An individual selling used goods through an online auction platform
D. A business selling products directly to customers online

Q29. Which of the following scenarios best illustrates mobility without wireless networking?

A. A smartphone accessing data over a cellular network
B. A desktop computer connected via Wi-Fi
C. A laptop connected to a wired network in a hotel room
D. A handheld device using Bluetooth communication

Q30. Which of the following isa primary function of a wireless sensor network?

A. Performing centralized data processing in data centers
B. Collecting and wirelessly transmitting data about physical environments
C. Managing large-scale databases
D. Providing user authentication services

Q31. The OSI reference model is a fundamental concept in networking. Which of the following best reflects its purpose?

A. To define specific hardware configurations for networks
B. To provide a standardized framework for understanding and designing network communication systems
C. To replace all existing network protocols
D. To restrict communication between different network vendors

Q32. In the physical layer, the maximum data rate of a communication channel depends on certain theoretical limits. Which of the following best describes the significance of Shannon's theorem in this context?

A. It determines the physical size of transmission media
B. It provides a theoretical upper bound on data transmission rate based on bandwidth and noise
C. It eliminates transmission errors completely
D. It defines routing algorithms for networks

Q33. Which of the following is primary advantage of fiber optic media over traditional copper-based media?

A. Lower installation cost in all scenarios
B. Ability to carry higher bandwidth signals with lower attenuation
C. Easier maintenance and repair
D. Compatibility with analog transmission only

Q34. Which of the following best describes the purpose of error-detecting codes such as CRC?

A. To correct all possible transmission errors automatically
B. To detect the presence of errors in transmitted data
C. To compress data before transmission
D. To increase transmission speed

Q35. What is the primary advantage of using sliding window protocols compared to stop-and-wait protocols?

A. They eliminate the need for acknowledgments
B. They allow multiple frames to be in transit simultaneously, improving efficiency
C. They reduce the size of transmitted data
D. They prevent all types of transmission errors

Q36. Which of the following is the fundamental working principle of Carrier Sense Multiple Access (CSMA) protocols?

A. Nodes transmit data without checking the channel
B. Nodes listen to the channel before transmitting to avoid collisions
C. Nodes use only fixed time slots for transmission
D. Nodes transmit data only after receiving acknowledgment

Q37. Which of the following is the main role of switching in modern Ethernet networks?

A. It increases collisions in the network
B. It allows multiple devices to share a single collision domain
C. It separates collision domains, improving network performance
D. It eliminates the need for MAC addresses

Q38. Which of the following correctly describes distance vector routing?

A. Each router has complete knowledge of the entire network topology
B. Routers exchange information with neighbors to determine shortest paths iteratively
C. Routing decisions are made only at the source node
D. It eliminates routing loops completely

Q39. Which one of the following is function of IP addressing?

A. To encrypt data packets during transmission
B. To uniquely identify devices and enable routing of packets across networks
C. To manage error correction at the transport layer
D. To allocate bandwidth dynamically

Q40. Which of the following mechanisms is primarily responsible for controlling congestion in TCP?

A. Error detection codes
B. Sliding window with congestion control algorithms
C. Fixed bandwidth allocation
D. Static routing tables

Q41. Which of the following is the primary function of the Domain Name System (DNS)?

A. To encrypt web traffic
B. To translate human-readable domain names into IP addresses
C. To manage file transfers between servers
D. To control network congestion

Q42. Network security involves multiple techniques for ensuring confidentiality and integrity. Which of the following best describes the role of public-key cryptography?

A. It uses a single shared key for encryption and decryption
B. It relies on symmetric algorithms only
C. It uses a pair of keys (public and private) for secure communication
D. It eliminates the need for authentication

Q43. IoT systems are often described using three fundamental dimensions. Which of the following combinations correctly represents these dimensions?

A. Devices, software, and networks for data storage
B. Things, connectivity, and semantic processing of data
C. Sensors, actuators, and controllers only
D. Hardware, operating system, and applications

Q44. In the context of IoT technical building blocks, which of the following is the role of middleware?

A. It provides direct communication between sensors only
B. It handles visualization and user interface exclusively
C. It facilitates data processing and analysis between hardware and presentation layers
D. It replaces the need for cloud computing

Q45. RFID technology is widely used in IoT applications. Which of the following statements correctly distinguishes between active and passive RFID systems?

A. Passive RFID has its own power source, while active RFID depends on readers
B. Active RFID uses reader signals only, while passive RFID is battery powered
C. Active RFID is self-powered and can communicate independently, whereas passive RFID relies on external signals
D. Both active and passive RFID require batteries

Q46.Which of the following options best illustrates the function of cloud processing in IoT systems?

A. Sensors operate independently without coordination
B. Devices only store data locally without analysis
C. Data collected from sensors is analyzed remotely to trigger automated actions
D. IoT systems function without any data storage

Q47. Which of the following options correctly describes the role of the communication layer in IoT layered architecture?

A. It stores and processes large datasets
B. It enables interaction between users and IoT services through networking protocols
C. It manages hardware sensors and actuators directly
D. It performs authentication and authorization exclusively

Q48.In a standard C/C++ program structure, the main() function plays a central role. Which of the following best describes the syntactic and functional significance of the main() function?

A. It is an optional function used only for debugging purposes
B. It is used exclusively for declaring global variables
C. It is executed only after all other functions have completed
D. It serves as the entry point where program execution begins

Q49.When declaring variables in C/C++, syntax rules must be strictly followed. Which of the following declarations is syntactically correct according to identifier naming conventions?

A. int 2value;
B. float value-1;
C. int value_1; #
D. char value 1;

Q50. Which of the following options best describes the overall transformation process performed by a compiler during program processing?

A. Conversion of machine code into high-level language instructions
B. Execution of source programs without intermediate representation
C. Transformation of program text into an abstract syntax tree followed by code generation
D. Direct translation of input data into output data without structural analysis

Q51. Which of the following is the primary role of lexical analysis in the compilation process?

A. To convert program text into tokens using pattern recognition techniques
B. To construct parse trees based on grammatical rules
C. To perform semantic checks such as type validation
D. To generate optimized machine code directly from source code

Q52. Regular expressions play a crucial role in lexical analysis. Which of the following best describes their function in defining tokens within a programming language?

A. They specify the hierarchical structure of programs
B. They determine memory allocation strategies
C. They define patterns that describe valid sequences of characters forming tokens
D. They optimize execution speed of compiled programs

Q53. Which of the following statements is true for bottom-up parsing?

A. It constructs parse trees from the root to the leaves

B. It starts with the input string and reduces it to the start symbol

C. It ignores grammar rules and relies only on heuristics

D. It is limited to deterministic grammars without conflicts

Q54. Attribute grammars are introduced as a method for context handling. Which of the following best describes their purpose in compiler design?

A. To associate semantic information with syntactic structures for context-sensitive analysis

B. To replace syntax analysis entirely

C. To generate machine code directly from tokens

D. To eliminate the need for symbol tables

Q55. Which of the following best describes the primary objective of data flow analysis in compiler design?

A. To convert high-level code into assembly instructions

B. To perform lexical tokenization of input programs

C. To analyze how data values propagate through program variables during execution

D. To design grammars for programming languages

Q56. Which of the following best distinguishes an interpreter from a compiler?

A. An interpreter executes the program directly, while a compiler translates it into target code

B. An interpreter produces optimized machine code, whereas a compiler does not

C. A compiler works only on low-level languages

D. An interpreter does not require any input program

Q57. Code generation involves several quality considerations. Which of the following are commonly considered important properties of generated code?

A. Correctness, speed, size, and power consumption

B. Portability, readability, and modularity

C. Syntax, semantics, and pragmatics

D. Compilation time, parsing complexity, and grammar ambiguity

Q58. Which of the following best describes the concept of register allocation by graph coloring in compiler design?

A. Assigning colors to variables to visualize program structure

B. Mapping variables to registers by modeling conflicts as a graph coloring problem

C. Compressing code size using color-based encoding
D. Rewriting source code using graphical representations

Q59. Which of the following best describes reference counting as a garbage collection technique?
A. It periodically scans memory to identify unreachable objects
B. It copies all active objects to a new memory space
C. It compacts memory without tracking object usage
D. It tracks the number of references to each object and deallocates when the count reaches zero

Q60. Which of the following is a distinct characteristic of functional programming relevant to compilation?
A. Programs are executed strictly in sequence with mutable state
B. Memory allocation is entirely manual
C. Control flow relies solely on goto statements
D. Functions are treated as first-class entities and support higher-order operations

Q61. In compiler design, what is the primary role of the Abstract Syntax Tree (AST) after lexical and syntax analysis?
A. It directly executes the program instructions
B. It represents the hierarchical syntactic structure of the program for further processing
C. It stores machine-level instructions for optimization
D. It replaces the need for parsing entirely

Q62. Which of the following options describes the boundary between lexical and syntactic analysis?
A. Lexical analysis handles semantics, while syntax analysis handles tokens
B. Syntax analysis precedes lexical analysis in all compiler designs
C. Both phases perform identical operations on the input
D. Lexical analysis groups characters into tokens, while syntax analysis organizes tokens into grammatical structures

Q63. Shift-reduce parsing methods are commonly associated with which parsing strategy in compiler design?

A. Top-down parsing using recursive expansion
B. Syntax analysis based only on lexical patterns
C. Semantic parsing without grammar productions
D. Bottom-up parsing that reduces symbols toward the start variable.

Q64. Semantic rules in compiler design are often attached to grammar productions mainly to:

A. Evaluate contextual and semantic properties during compilation.
B. Replace token generation completely
C. Eliminate the use of parsing tables
D. Directly execute source programs without translation

Q65. Which statement best explains the operational difference between just-in-time interpretation and ahead-of-time compilation?

A. Interpreted execution processes instructions during runtime, while compiled execution generates executable code before running.
B. Compiled execution always requires source code during runtime
C. Interpreters permanently store machine code after every execution
D. Both techniques execute programs identically at hardware level

Q66. Which of the following goals is generally considered important while optimizing generated machine code?

A. Producing correct, efficient, and compact executable code.
B. Increasing grammar ambiguity for flexibility
C. Maximizing the number of intermediate instructions
D. Reducing lexical analysis accuracy

Q67. Mark-and-sweep garbage collection works primarily by:

A. Counting active references for each object continuously
B. Manually releasing memory after program execution
C. Moving all objects into a secondary memory region
D. Identifying reachable objects and reclaiming memory occupied by unreachable ones.

Q68. The #include directive is part of the preprocessor in C/C++. Which of the following best describes its syntactic role in a program?

A. It executes code during runtime
B. It defines variables globally
C. It allocates memory dynamically
D. It includes the contents of a file before compilation begins

Q69. In the development of efficient software applications, why is the selection of an appropriate data structure considered important?

A. Because it determines the programming language used for implementation
B. Because it eliminates the need for algorithms in problem-solving
C. Because it restricts the type of problems that can be solved
D. Because it directly influences the efficiency of data storage, retrieval, and processing

Q70. An algorithm is considered a systematic method for solving problems. Which of the following statements best describes its fundamental nature?

A. It is a random sequence of instructions without a defined structure
B. It always produces multiple outputs for a single input
C. It focuses only on data storage rather than processing
D. It consists of a finite set of well-defined steps executed sequentially to solve a problem

Q71. When multiple algorithms exist for solving the same problem, what becomes the primary criterion for selecting the most suitable one?

A. The length of the program code
B. The programming language used
C. The performance in terms of time and space efficiency
D. The number of variables used

Q72. Which of the following characteristics ensures that an algorithm terminates after executing a limited number of steps?

A. Finiteness
B. Definiteness
C. Effectiveness
D. Generality

Q73. In algorithm design, the concept of “definiteness” implies which of the following?

A. Each step must be vague and flexible
B. The algorithm must run indefinitely
C. Each step must be clearly defined and unambiguous
D. The algorithm must use recursion

Q74. Which of the following is the correct option for the relationship between data structures and algorithms?

A. Data structures eliminate the need for algorithms
B. Algorithms operate independently of data structures
C. Data structures organize data, while algorithms define operations on that data
D. Both are unrelated concepts in programming

Q75. Which of the following is correctly identified as a linear data structure?

A. Trees
B. Graphs
C. Lists
D. Hash tables

Q76. According to the classification of data structures, which of the following belongs to non-linear data structures?

A. Arrays
B. Stacks
C. Queues
D. Trees

Q77. Which of the following is correct purpose of asymptotic notations such as Big-O in algorithm analysis?

A. To determine the syntax of programming languages
B. To evaluate the performance and running time of algorithms
C. To define data storage formats
D. To improve hardware efficiency

Q78. Which of the following is a valid characteristic of a well-designed algorithm regarding input and output?

A. It may or may not accept input values
B. It should accept zero or more inputs and produce at least one output
C. It must always accept exactly one input
D. It should not produce any output

Q79. Data structures are often implemented using various approaches. Which of the following best represents commonly used data structures?

A. Arrays, stacks, queues, and linked lists
B. Compilers, interpreters, and debuggers
C. Operating systems and databases
D. Routers and network protocols

Q80. Which of the following best reflects the scope of software engineering as an engineering discipline?

A. It focuses only on coding and debugging activities in software development
B. It is limited to designing algorithms and data structures
C. It deals only with theoretical aspects of computing systems
D. It includes all aspects from system specification to maintenance after deployment

Q81. Which of the following correctly distinguishes professional software from personal programming in terms of software artifacts?

A. Professional software requires only executable code without documentation
B. Personal software must always include detailed documentation
C. Professional software avoids reuse to ensure originality
D. Professional software includes programs along with documentation and configuration data

Q82. In software process models, four fundamental activities are identified. Which of the following sequences correctly represents these core software process activities?

A. Design → Testing → Deployment → Maintenance
B. Coding → Debugging → Documentation → Delivery
C. Analysis → Compilation → Execution → Monitoring
D. Specification → Development → Validation → Evolution

Q83. In distributed software engineering, which best characterizes the client–server model?

A. All processing is performed on a single centralized machine
B. Clients request services and servers provide shared resources over a network
C. Each node operates independently without communication
D. Processing is restricted to embedded hardware systems

Q84. Which best explains the role of services in service-oriented architecture (SOA)?

A. Services are tightly coupled modules that cannot be reused independently
B. Services replace all forms of traditional programming
C. Services act as reusable, loosely coupled components accessed over a network
D. Services operate only within a single machine environment

Q85. Which is a critical requirement for embedded systems?

A. Unlimited computational resources and flexible timing
B. Independence from hardware components
C. Strict timing constraints and interaction with hardware devices
D. Exclusive use of high-level scripting languages

Q86. Which is true for risk management in software projects?

A. Identifying, analysing, and mitigating potential risks during development
B. Eliminating all uncertainties before project initiation
C. Avoiding complex projects entirely
D. Delegating all decisions to automated tools

Q87. Which is the purpose of version management in configuration management?

A. To eliminate the need for software testing
B. To prevent software reuse
C. To reduce system documentation
D. To track and control different versions of software components over time

Q88. Which is the primary objective of an operating system?
A. To eliminate the need for application programs
B. To directly execute machine instructions without abstraction
C. To restrict access to hardware components permanently
D. To provide efficient and convenient use of hardware resources while ensuring fairness among users

Q89. What is the correct role of interrupts in system performance?
A. They reduce CPU clock speed
B. They keep CPU idle during I/O operations
C. They enable execution of other tasks during I/O waiting time
D. They eliminate memory management

Q90. Which is a correct option for process in operating systems?
A. A static program stored in memory
B. A program in execution along with its current state and resources
C. A set of CPU instructions only
D. A memory location containing executable code

Q91. What is the advantage of multithreading?
A. Eliminates context switching
B. Runs multiple programs independently
C. Improves responsiveness and resource utilization via concurrent execution
D. Eliminates memory management

Q92. What is the purpose of semaphores?
A. Dynamic memory allocation
B. Managing shared resources and preventing race conditions
C. Increasing CPU speed
D. Eliminating deadlocks

Q93. Which condition is necessary for deadlock?
A. Independent processes
B. Infinite resources
C. Circular wait condition
D. Preemption always allowed

Q94. What is the primary purpose of virtual memory?
A. Increase CPU speed
B. Provide large address space using secondary storage
C. Eliminate RAM
D. Restrict process execution

Q95. What defines time-sharing systems?
A. Sequential execution of processes
B. CPU divided into time slices among processes
C. Only system processes run
D. Priority-only scheduling

Q96. What is a key feature of Linux scheduling?
A. First-come-first-served only
B. No priorities
C. Dynamic priority-based time-sharing
D. No multitasking

Q97. What is the role of a file directory?
A. Stores file content
B. Executes programs
C. Manages CPU scheduling
D. Maintains metadata and organizes file access

Q98. Which of the following best distinguishes online transaction processing (OLTP) systems from data analytics workloads in traditional database environments?
A. OLTP processes large batches of historical data, while analytics handles real-time transactions
B. OLTP eliminates the need for concurrency control, while analytics requires strict locking
C. OLTP operates only on distributed systems, while analytics operates only on centralized systems
D. OLTP involves frequent small updates and queries, while analytics focuses on extracting patterns from large datasets

Q99. In relational database design, normalization aims to reduce redundancy and improve integrity. Which of the following best explains the purpose of Boyce-Codd Normal Form (BCNF) in relational database design?
A. To ensure that every non-key attribute is fully functionally dependent on the primary key
B. To eliminate multivalued dependencies only
C. To ensure that for every functional dependency, the determinant is a superkey
D. To allow partial dependencies for better performance

Q100. Modern databases support semi-structured data such as JSON and XML. Which of the following best characterizes semi-structured data as discussed in database systems?
A. Data strictly following a relational schema with fixed attributes
B. Data with no structure or organization

C. Data that may not conform to a rigid schema but contains tags or markers to separate elements

D. Data stored only in binary format

Q101. In database indexing, B+ trees are widely used. Which of the following best describes a key advantage of B+ tree index structures?

A. They store all records only in internal nodes

B. They allow efficient range queries due to linked leaf nodes

C. They eliminate the need for disk storage

D. They require no rebalancing operations

Q102. Query processing involves evaluating relational operations efficiently. Which of the following is the role of join algorithms in query processing?

A. They are used only for sorting data

B. They eliminate duplicate records only

C. They replace indexing mechanisms

D. They combine tuples from two relations based on a condition, often optimized for large datasets

Q103. Query optimization transforms queries into efficient execution plans. Which of the following is the purpose of cost estimation in query optimization?

A. To calculate storage capacity requirements

B. To determine the exact execution time of queries

C. To estimate the relative cost of different execution plans and choose the most efficient one

D. To eliminate all possible query plans

Q104. Transaction management ensures reliability in databases. Which of the following is correct for the atomicity property of transactions?

A. A transaction must execute concurrently with others

B. A transaction must be visible to all users immediately

C. A transaction must either complete entirely or have no effect at all

D. A transaction must always be reversible

Q105. Concurrency control mechanisms ensure correct execution of transactions. Which one of the following best describes two-phase locking (2PL)?

A. Locks are acquired and released simultaneously

B. Transactions have a growing phase (acquiring locks) and a shrinking phase (releasing locks)

C. Locks are never released until system shutdown

D. Locks are used only for read operations

Q106. Which statement is the reason for the rapid adoption of computer graphics in the fields of engineering and medicine?

A. It eliminates the need for computational hardware

B. It replaces traditional mathematical modeling entirely

C. It restricts data representation to only visual formats

D. It enables fast and cost-effective generation and visualization of graphical data

Q107. In computer-aided design (CAD) systems, wireframe models are frequently used during the early stages of design. What is the most appropriate reason for using wireframe representations?

A. They allow quick visualization of internal and external structures for interactive modifications

B. They provide fully realistic surface rendering

C. They eliminate the need for geometric transformations

D. They automatically generate manufacturing instructions

Q108. Which of the following best describes the role of multi-window environments in CAD applications?

A. They allow simultaneous viewing of different sections or perspectives of a design

B. They restrict the display to a single perspective view

C. They reduce memory usage in graphics systems

D. They eliminate the need for user interaction

Q109. In presentation graphics, charts such as bar graphs and pie charts are widely used. What is the primary objective of these graphical representations?

A. To replace numerical data entirely

B. To increase computational complexity

C. To visually summarize relationships among multiple parameters in datasets

D. To eliminate statistical analysis

Q110. Three-dimensional graphical representations are sometimes used in presentation graphics even when not strictly necessary. What is the most appropriate justification for their use?

A. They always improve computational efficiency

B. They eliminate the need for data preprocessing

C. They provide a more visually appealing or dramatic representation of data

D. They reduce the dimensionality of datasets

Q111. Paint programs in computer graphics simulate traditional artistic tools. Which feature best characterizes advanced paintbrush systems described in the text?

A. They only allow monochrome drawing
B. They convert images directly into 3D models
C. They eliminate the need for input devices
D. They simulate brush strokes, pressure sensitivity, and color variation

Q112. Computer-generated animations often rely on sequential image frames. What is the key principle behind producing smooth motion in such animations?

A. Rendering all frames simultaneously
B. Slightly modifying object positions between consecutive frames
C. Using only static images
D. Eliminating intermediate frames

Q113. Which of the following defines morphing?

A. Rendering high-resolution static images
B. Converting 2D images into 3D models
C. Gradually transforming one object or image into another
D. Compressing graphical data

Q114. What is the primary advantage of using graphical simulators in training environments?

A. They eliminate the need for theoretical knowledge
B. They allow safe and controlled interaction with realistic system models
C. They reduce system complexity permanently
D. They replace real-world equipment entirely

Q115. What is the main purpose of incorporating graphical displays in simulators like flight simulators?

A. To reduce hardware cost
B. To eliminate user controls
C. To simplify aircraft design
D. To provide realistic visual feedback for operational training

Q116. What is the primary purpose of integrating graphics with live-action scenes in entertainment industries?

A. To eliminate actors entirely
B. To enhance realism and create effects that are difficult or impossible in real life
C. To reduce production time to zero
D. To avoid the use of cameras

Q117. C is often described as a “middle-level language” in programming literature. Which of the following best explains this characterization in terms of its capabilities and abstraction level?

A. It combines low-level memory access features with high-level structured programming constructs.

B. It only supports high-level abstractions like classes and objects

C. It is designed exclusively for machine-level programming

D. It eliminates the use of hardware-level operations entirely

Q118.Which of the following best describes the significance of operator precedence in evaluating expressions in C and C++?

A. It specifies the order in which operations are performed in an expression.

B. It determines the memory allocation for variables

C. It restricts the use of certain operators

D. It eliminates ambiguity in variable declaration

Q119. What is the primary advantage of using a switch statement over multiple if-else statements?

A. It allows evaluation of floating-point expressions only

B. It provides a more structured and readable way to handle multiple discrete values of a variable.

C. It executes faster in all situations without exception

D. It eliminates the need for conditional expressions

Q120. Which of the following statements best explains this relationship between arrays and pointers?

A. Arrays and pointers are completely unrelated data structures

B. Pointers cannot reference array elements

C. The name of an array acts as a constant pointer to its first element.

D. Arrays can only store pointer values

Q121. Which of the following best describes pointer arithmetic in C++?

A. It allows pointers to store arithmetic expressions

B. It converts pointers into integers

C. It restricts pointers to fixed memory locations

D. It enables incrementing or decrementing pointer values based on the size of the data type they reference.

Q122. Functions in C/C++ can be invoked using different parameter passing mechanisms. What is the key difference between call by value and call by reference?

A. Call by value modifies the original variable, while call by reference does not

B. Call by reference passes a copy of the variable, while call by value passes the address

C. Call by value passes a copy of the argument, whereas call by reference allows direct modification of the original variable.

D. There is no difference between the two

Q123. File handling is an essential aspect of programming. Which of the following best describes the role of a file pointer in C file I/O operations?

A. It stores the entire content of a file in memory

B. It tracks the current position within an open file.

C. It replaces the need for file names

D. It converts binary files into text files

Q124. What is the primary purpose of the #define directive?

A. To define symbolic constants or macros that are replaced before compilation.

B. To declare variables globally

C. To execute runtime instructions

D. To allocate memory dynamically

Q125. Which of the following options correctly defines encapsulation in C++?

A. Combining data and functions into a single unit and restricting direct access to some components.

B. Allowing multiple inheritance of classes

C. Executing functions at compile time

D. Replacing pointers with references

Q126.What is the correct purpose of constructors in a class?

A. To destroy objects when they go out of scope

B. To initialize objects when they are created.

C. To allocate memory manually

D. To overload operators automatically

Q127. Templates in C++ enable generic programming. What is the primary advantage of using templates?

A. They restrict functions to a single data type

B. They eliminate the need for functions

C. They replace object-oriented programming

D. They allow writing functions and classes that can operate with different data types without rewriting code.

Q128. In the context of client-side web programming, which of the following is the primary role of HTML, CSS, and JavaScript?

A. HTML structures content, CSS controls presentation, and JavaScript enables interactivity and computation.

B. HTML handles styling, CSS manages logic, and JavaScript structures content

C. HTML performs server-side processing, CSS handles databases, and JavaScript manages networking

D. HTML and CSS are interchangeable, while JavaScript is optional

Q129. Which of the following best describes the difference between client-side and server-side web programming?

A. Client-side programming executes on web servers, while server-side runs on user devices

B. Both client-side and server-side programming execute only on browsers

C. Client-side programming performs computations on the user's computer, whereas server-side programming processes data on the hosting server.

D. Server-side programming is obsolete and replaced entirely by client-side technologies

Q130. Why is JavaScript included alongside HTML and CSS in web development, instead of relying only on markup and styling languages?Select correct option.

A. Because JavaScript is required for database management

B. Because HTML cannot function without JavaScript

C. Because CSS is no longer used in modern web development

D. Because JavaScript enables calculations and processing of user input, making web pages interactive.

Q131.Relational operators are fundamental in forming conditional expressions. Which of the following expressions is syntactically valid and correctly evaluates equality in C/C++?

A. if (a = b)

B. if (a == b)

C. if (a === b)

D. if (a equals b)

Q132.Selection statements control the flow of execution. Which of the following best describes the syntactic requirement of an if statement in C/C++?

A. It must always include an else block

B. It can only evaluate integer expressions

C. It requires a loop structure to execute

D. The condition must be enclosed within parentheses

Q133 Functions in C/C++ follow a defined syntax for declaration. Which of the following best represents the correct general form of a function definition?

A. function name(parameters) return_type { }
B. return_type function_name(parameters) { }
C. function_name return_type(parameters) { }
D. parameters return_type function_name { }

Q134. Why is adherence to standards organizations such as W3C, WHATWG, and Ecma International important in education?

A. It ensures compatibility with outdated browsers only
B. It guarantees that all code will run without errors
C. It ensures that the technologies and practices taught are widely accepted and standardized across the industry.
D. It limits the use of modern web technologies

Q135. Loop constructs in C/C++ require specific syntax. Which of the following correctly represents the general structure of a for loop?

A. for (condition; initialization; increment)
B. for (increment; condition; initialization)
C. for (initialization; condition; increment)
D. for (initialization condition increment)

Q136. What is the best training sequence for beginners in web development?

A. It introduces advanced JavaScript concepts before HTML basics
B. It focuses only on CSS before any HTML is introduced
C. It begins with HTML fundamentals, progresses to CSS for styling, and then introduces JavaScript for interactivity.
D. It teaches server-side programming before client-side technologies

Q137.Why is binary representation preferred over decimal representation in computer systems?

A. Binary numbers require fewer digits than decimal numbers
B. Binary representation aligns with two stable physical states in electronic circuits.
C. Decimal systems are incompatible with logic gates
D. Binary representation eliminates the need for memory

Q138. Which of the following best describes the functional role of a logic gate in a digital system?

A. It stores binary data permanently
B. It performs arithmetic operations only
C. It implements Boolean functions by manipulating binary inputs.
D. It converts analog signals into digital signals

Q139. In Boolean algebra, which principle allows the simplification of expressions such that the complement of a variable is used to derive an equivalent expression?

A. Associative Law
B. Commutative Law
C. Identity Law
D. De Morgan's Theorem.

Q140. When simplifying Boolean expressions using Karnaugh maps (K-maps), what is the primary objective of grouping adjacent cells containing 1s?

A. To increase the number of variables in the expression
B. To convert the expression into decimal form
C. To ensure all minterms are included separately
D. To eliminate redundant variables and obtain a minimal expression.

Q141. Which of the following best characterizes a combinational circuit in digital design?

A. Output depends on present inputs and previous states
B. Output is independent of inputs
C. Output depends only on clock signals
D. Output depends only on present inputs.

Q142. In a full-adder circuit, what is the fundamental reason for introducing a carry input in addition to two input bits?

A. To simplify Boolean expressions
B. To allow addition of multi-bit binary numbers.
C. To reduce the number of logic gates
D. To eliminate overflow conditions

Q143. Which of the following statements best describes the behavior of a D flip-flop in a sequential circuit?

A. It toggles its state on every clock pulse
B. Its output follows the input continuously without delay
C. It stores the value of the input at the moment of a clock transition.
D. It always outputs the complement of the input

Q144. In digital components, what is the primary function of a decoder circuit?

A. To convert multiple outputs into a single input
B. To select one input from many inputs
C. To convert binary information into a unique output line.
D. To store encoded data

Q145. Which of the following best explains the role of registers in computer architecture?

A. They perform logical operations only
B. They store binary information temporarily using flip-flops.
C. They control input-output devices
D. They convert analog signals into digital signals

Q146. In the context of a multiplexer, how is the output line determined?

A. By summing all input signals
B. By randomly selecting an input line
C. By using selection inputs to choose one of many data inputs.
D. By storing all input values simultaneously

Q147. Which of the following best describes the concept of a sequential circuit compared to a combinational circuit?

A. It depends only on present inputs
B. It has no memory elements
C. Its output depends on both present inputs and past states.
D. It cannot use flip-flops

Q148. In the context of set theory, which of the following statements best describes the role of the "universe of discourse" when defining sets?

A. It defines the total collection from which elements of a set are drawn.
B. It restricts sets to only finite elements.
C. It ensures all sets are mutually disjoint.
D. It eliminates the need for characteristic functions.

Q149. Which of the following identities correctly represents a distributive law of sets?

A. $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
B. $A \cup (B \cap C) = (A \cap B) \cup (A \cap C)$
C. $A \cap (B \cup C) = (A \cup B) \cap (A \cup C)$
D. $A \cap (B \cup C) = (A \cap B) \cap (A \cap C)$

Q150. Which of the following best explains why equivalence relations are important in discrete mathematics?

A. They partition a set into disjoint equivalence classes.
B. They eliminate redundancy in functions.
C. They ensure all relations are symmetric.
D. They convert relations into functions.

Q151. A function (f: A → B) is said to be one-to-one (injective) if:

A. Every element of B has a preimage in A.

B. Distinct elements of A map to distinct elements of B.

C. Every element of A maps to all elements of B.

D. Elements of B map back to A uniquely.

Q152.Which principle is primarily used to count the number of ways an event can occur when it can be broken into mutually exclusive cases?

A. Inclusion-Exclusion Principle

B. Multiplication Principle

C. Addition Principle

D. Pigeonhole Principle

Q153. What distinguishes permutations from combinations in counting problems?

A. Permutations ignore repetition.

B. Combinations consider order, permutations do not.

C. Permutations consider order, combinations do not.

D. Both treat order identically.

Q154. Which method is used to solve linear recurrence relations with constant coefficients?

A. Inclusion-Exclusion method

B. Characteristic root method

C. Pigeonhole method

D. Greedy algorithm

Q155. Which of the following statements best defines a simple graph?

A. A graph with weighted edges.

B. A graph with directed edges only.

C. A graph with no loops and no multiple edges.

D. A graph with cycles only.

Q156. Which property uniquely characterizes a tree in graph theory?

A. It contains at least one cycle.

B. It is a connected graph with no cycles.

C. It has equal number of vertices and edges.

D. It must be directed.

Q157. Which of the following laws in Boolean algebra states that A + A = A and A · A = A?

A. Commutative Law
B. Distributive Law
C. Idempotent Law
D. Absorption Law

Q158. Which rule of inference allows one to conclude q from p → q and p?

A. Modus Tollens
B. Hypothetical Syllogism
C. Modus Ponens
D. Disjunctive Syllogism

Q159.In the context of computer system architecture, which combination best represents the fundamental structural elements required for program execution and system functionality?

A. Compiler, assembler, interpreter, linker
B. Processor, main memory, I/O modules, and system bus
C. Cache, registers, pipelines, and threads
D. Kernel, shell, utilities, and drivers

Q160.Which of the following best explains the role of the program counter (PC) during instruction execution in a processor?

A. It stores the result of arithmetic operations.
B. It contains the address of the next instruction to be executed.
C. It holds the currently executing instruction permanently.
D. It manages communication between I/O devices.

Q161.During the instruction cycle, what is the primary function of the Instruction Register (IR)?

A. To store memory addresses for data access
B. To buffer input/output data
C. To maintain system clock timing
D. To temporarily hold the instruction currently being executed

Q162.Which of the following best characterizes the purpose of cache memory within the memory hierarchy?

A. To permanently store large datasets
B. To provide backup storage for system recovery
C. To reduce access time by storing frequently used data closer to the CPU
D. To replace main memory entirely

Q163.What is the key advantage of Direct Memory Access (DMA) in modern computer systems?

A. It increases processor clock speed
B. It allows I/O devices to transfer data without continuous CPU intervention
C. It replaces the need for interrupts
D. It simplifies instruction execution

Q164.Which statement best describes the evolution of microprocessors in modern computing systems?

A. They have integrated multiple cores and advanced processing capabilities on a single chip
B. They have become obsolete due to distributed computing
C. They no longer support multitasking
D. They rely entirely on external memory for processing

Q165.Which of the following is concept of an instruction cycle in a processor?

A. A sequence of fetching and executing instructions repeatedly
B. A process of compiling and linking programs
C. A method of allocating memory to processes
D. A mechanism for managing file systems

Q166.In operating system design, why is understanding hardware architecture essential?

A. Because operating systems directly replace hardware components
B. Because hardware determines programming languages
C. Because the OS must efficiently manage and utilize hardware resources
D. Because the OS eliminates the need for hardware optimization

Q167.Which of the following indicates the role of I/O modules in a computer system?

A. To execute instructions independently
B. To store long-term data permanently
C. To facilitate data transfer between the computer and external devices
D. To manage process scheduling

Q168.What is the primary purpose of the Memory Buffer Register (MBR) in processor operations?

A. To store instruction addresses permanently
B. To manage interrupt signals
C. To execute arithmetic operations
D. To hold data being transferred to or from memory

Q169 Which of the following is the significance of multicore processors in modern computing systems?

A. They reduce memory capacity requirements
B. They eliminate the need for operating systems
C. They simplify I/O operations only
D. They enable parallel processing by integrating multiple processing units on a single chip

Q170.Database systems are designed to manage large collections of data efficiently. Which of the following best explains the primary goal of a Database Management System (DBMS) in an enterprise environment?

A. To replace all application programs with a single executable system
B. To eliminate the need for data security and backup mechanisms
C. To restrict data access to only system administrators
D. To provide a convenient and efficient way to store, retrieve, and manage data

Q171.Modern database systems rely heavily on abstraction to manage complexity. Which of the following best describes the role of abstraction in database systems?

A. It removes all data relationships permanently
B. It forces users to understand physical storage structures
C. It eliminates the need for database schemas
D. It allows users to interact with data without knowing underlying storage details

Q172. Which of the following options represents structured data in a database system?

A. A university database storing student records with fixed attributes
B. Social media posts containing images and videos
C. Web browsing history with varying formats
D. Document collections with inconsistent formats

Q173.Database usage can be broadly categorized into transactional and analytical modes. Which of the following best characterizes Online Transaction Processing (OLTP)?

A. Processing large historical datasets for trend analysis
B. Performing complex data mining algorithms
C. Handling frequent, small transactions with multiple users concurrently
D. Storing unstructured multimedia data only

Q174.Data analytics plays a critical role in decision-making. Which of the following best explains the function of predictive models in database analytics?

A. They store raw data permanently
B. They eliminate the need for historical data

C. They use past data to infer patterns and support future decisions
D. They replace database management systems entirely

Q175.Traditional file-processing systems have several disadvantages compared to DBMS. Which of the following best explains the issue of data redundancy in such systems?
A. Data is stored only once, causing lack of availability
B. The same data is stored in multiple files, leading to duplication and inconsistency
C. Data is encrypted multiple times
D. Data is processed only in real time

Q176.Which of the following best explains why database systems are essential for modern enterprises such as banking, airlines, and e-commerce platforms?
A. They eliminate the need for hardware resources
B. They allow data to be stored randomly without structure
C. They manage large volumes of data accessed by multiple users simultaneously
D. They operate independently of application programs

Q177.In database systems, managing concurrent access to data is crucial. Which of the following best explains why multiple-user access requires careful system design?
A. It reduces system performance permanently
B. It eliminates the need for backup systems
C. It can lead to inconsistent or anomalous results if not controlled properly
D. It simplifies transaction processing

Q178.Which of the following is the key difference between early database systems and modern database systems?
A. Early systems handled complex multimedia data, while modern systems handle only structured data
B. Early systems focused on simple structured data, while modern systems support complex and variable data types
C. Early systems had advanced query optimization, while modern systems do not
D. Early systems were distributed globally, while modern systems are localized

Q179.Database systems must ensure data safety even in adverse situations. Which of the following best explains this requirement?
A. Data must be deleted regularly
B. Systems must ensure data integrity despite crashes or unauthorized access
C. Data should be stored only in volatile memory
D. Backup mechanisms are optional

Q180.Which of the following is the importance of database systems in everyday applications such as social media and online shopping?

A. They are used only for storing temporary files

B. They replace user interfaces entirely

C. They eliminate the need for internet connectivity

D. They enable seamless interaction with large datasets without exposing complexity to users

Q181.In digital computer systems, abstraction is an important principle used to manage system complexity. Which of the following best describes the role of abstraction in digital systems design?

A. By eliminating the need for hardware components entirely

B. By converting all operations into analog signals

C. By restricting system operations to fixed instruction sets only

D. By representing complex operations through simplified logical and functional models

Q182.Arrays are declared using a specific syntax in C/C++. Which of the following correctly declares an integer array of size 10?

A. int arr = [10];

B. int arr(10);

C. int arr[10];

D. array int arr[10];

Q183.What is the primary purpose of a truth table in digital logic design?

A. To store binary data permanently

B. To simplify hardware wiring connections

C. To convert analog signals into digital form

D. To list all possible input combinations and their corresponding outputs

Q184 Which of the following is an advantage of simplifying Boolean expressions using identities and theorems?

A. It increases the number of logic gates required

B. It reduces circuit complexity and improves efficiency

C. It eliminates the need for binary variables

D. It converts logic circuits into sequential circuits

Q185.Which of the following is the significance of grouping adjacent cells in a K-map?

A. It helps derive a simplified Boolean expression with fewer variables

B. It increases the number of minterms in the expression

C. It converts the expression into decimal representation

D. It ensures all outputs are equal to zero

Q186.Which of the following best describes the operation of a synchronous counter in digital electronics?

A. Its output depends on both present inputs and past states A. Its output depends only on the present input signals
B. It operates without any clock signal
C. It cannot store previous states or binary sequences
D. All flip-flops are triggered simultaneously by a common clock pulse.

Q187.What is the limitation of half-adder circuit?

A. It cannot produce a sum output
B. It does not consider carry input from previous stages
C. It requires more hardware than a full-adder
D. It operates only on decimal numbers

Q188.What is the characteristic behavior of a JK flip-flop when both J and K inputs are HIGH during a clock pulse?

A. The output remains unchanged
B. The output becomes permanently HIGH
C. The output toggles to the opposite state
D. The output follows the clock continously

Q189.What fundamentally distinguishes synchronous sequential circuits from combinational circuits?

A. Their outputs depend only on current input conditions
B. They operate without storage elements
C. They use memory elements and clock- controlled state transistions
D. They cannot perform logical operations

Q190.What is the primary purpose of an encoder circuit in digital electronics?

A. To transform multiple input signals into a coded binary output.
B. To convert coded inputs into multiple output lines
C. To store binary information temporarily
D. To perform arithmetic computations on digital data

Q191. What is the main function of a demultiplexer circuit?

A. To select one input from many input lines
B. To route a single input signal to one of several output lines based on selection inputs
C. To convert analog data into binary form
D. To store multiple outputs simultaneously

Q192. Pointers in C/C++ are declared using the * operator. Which of the following correctly declares a pointer to an integer variable?

A. int ptr*;
B. int **ptr;*
C. pointer int ptr;
D. int ptr;

Q193.Software systems are often described as abstract and intangible. Which of the following best explains a key implication of this characteristic in software development?

A. Software systems cannot be modified after development
B. Software systems are limited by physical material constraints
C. Software systems can become highly complex and difficult to manage
D. Software systems do not require design processes

Q194.In professional software development, what distinguishes software engineering from individual programming practices?

A. Software engineering focuses only on writing efficient code
B. Individual programming requires formal validation techniques
C. Software engineering avoids teamwork to reduce complexity
D. Software engineering includes systematic processes, documentation, and long-term maintenance

Q195.Software quality is determined not only by functionality but also by non-functional attributes. Which of the following best illustrates this broader view of quality?

A. Ensuring only correct output for given inputs
B. Focusing solely on minimizing development cost
C. Considering factors such as maintainability, reliability, and usability
D. Restricting software usage to expert users only

Q196.Different types of software applications require different engineering approaches. Which of the following best explains why no universal software engineering method exists?

A. All software systems are identical in structure
B. Software development is purely theoretical
C. Different applications have varying requirements, constraints, and environments
D. Software engineering methods are obsolete

Q197.In the context of software process activities, which of the following best explains the purpose of software validation?

A. To design the architecture of the system
B. To ensure the software meets customer requirements and expectations
C. To implement the system using programming languages
D. To manage project budgets and schedules

Q198.Web-based systems have significantly influenced software engineering practices. Which of the following indicates this impact?

A. Elimination of distributed systems
B. Reduction in software reuse practices
C. Increased use of reusable components and service-based architectures
D. Replacement of all traditional software development methods

Q199.Ethical responsibility is an important aspect of software engineering. Which of the following represents the principle of professional competence?

A. Accepting all projects regardless of skill level
B. Misrepresenting technical abilities to secure work
C. Undertaking only work within one's capability and expertise
D. Sharing confidential client data for research purposes

Q200.In software engineering ethics, confidentiality is a key concern. Which of the following best reflects this principle?

A. Publicly sharing all project information
B. Respecting client and employer information without unauthorized disclosure
C. Ignoring data protection laws when necessary
D. Prioritizing personal gain over organizational trust