

Total No. of Printed Pages : 21

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ARE ASKED TO DO SO)

A

PHD-EE-2023-24
Computer Science

SET-X

10021

Sr. No.

Time : 1¼ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (in words) _____

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1. Which of the following is an example of a tautology ?
 - (1) $p \text{ AND } \sim p$
 - (2) $p \text{ OR } \sim p$
 - (3) $p \text{ XOR } \sim p$
 - (4) $p \leftrightarrow \sim p$
2. Which property is not necessarily satisfied by an equivalence relation ?
 - (1) Reflexivity
 - (2) Symmetry
 - (3) Transitivity
 - (4) Asymmetry
3. If there are 8 pigeons and 7 pigeonholes, what is guaranteed according to the Pigeonhole Principle ?
 - (1) Some pigeonhole is empty.
 - (2) Some pigeonhole has more than one pigeon.
 - (3) Each pigeonhole has exactly one pigeon.
 - (4) Each pigeonhole has at most one pigeon.
4. In cryptography, which concept from group theory is utilized to secure communication through public-key cryptography ?
 - (1) Isomorphism
 - (2) Homomorphism
 - (3) Automorphism
 - (4) Discrete logarithm problem
5. What is the chromatic number of a graph ?
 - (1) The minimum number of colors needed to color the vertices of the graph such that no two adjacent vertices have the same color.
 - (2) The maximum degree of any vertex in the graph.
 - (3) The minimum degree of any vertex in the graph.
 - (4) The maximum number of vertices that are pairwise adjacent.

6. Which algebraic structure has both addition and multiplication operations, where multiplication is distributive over addition, and it may not have multiplicative inverses for all elements ?
- (1) Group (2) Ring
(3) Field (4) Integral Domain
7. Which algorithm is commonly used to find the shortest path between two vertices in a weighted graph ?
- (1) Breadth-First Search (BFS) (2) Depth-First Search (DFS)
(3) Dijkstra's algorithm (4) Kruskal's algorithm
8. What does the expression $\forall x \exists y P(x, y)$ mean in terms of nested quantifiers ?
- (1) There exists an x such that for every y , $P(x, y)$ is true.
(2) For every x , there exists a y such that $P(x, y)$ is true.
(3) There exists an x and a y such that $P(x, y)$ is true.
(4) For every x and y , $P(x, y)$ is true.
9. Which rule of inference is represented by the statement " p implies q , and p is true, therefore q is true" ?
- (1) Modus Ponens (2) Modus Tollens
(3) Hypothetical Syllogism (4) Disjunctive Syllogism
10. If $C = A \cap B$, what is the complement of set C with respect to the universal set U ?
- (1) $A \cap B$ (2) $A \cup B$
(3) $A - B$ (4) $A' \cup B'$

A

11. What is the primary characteristic of combinational circuits ?
- (1) Feedback
 - (2) Memory elements
 - (3) Sequential operation
 - (4) No feedback
12. What is the purpose of a shift microoperation ?
- (1) Transfer data from one register to another
 - (2) Shift bits within a register
 - (3) Perform arithmetic operations
 - (4) Move data within a register
13. What is the primary function of the control unit in a computer ?
- (1) Execute arithmetic operations
 - (2) Manage input-output operations
 - (3) Control the flow of data within the CPU
 - (4) Manage the memory hierarchy
14. In a general register organization, what are the registers used for ?
- (1) To store program instructions
 - (2) To store intermediate data during program execution
 - (3) To manage input-output operations
 - (4) To store permanent data
15. What is the primary advantage of pipelining in computer architecture ?
- (1) Improved instruction set
 - (2) Faster clock speed
 - (3) Increased throughput
 - (4) Reduced power consumption

16. What is the purpose of DMA (Direct Memory Access) in computer systems ?
- (1) Execute arithmetic operations
 - (2) Manage input-output operations
 - (3) Transfer data between main memory and auxiliary memory
 - (4) Control the flow of data within the CPU
17. What is the role of cache memory in the memory hierarchy ?
- (1) Store permanent data
 - (2) Provide fast access to frequently used data
 - (3) Manage input-output operations
 - (4) Control the flow of data within the CPU
18. What is a characteristic feature of a multicore processor ?
- (1) Single processor with multiple cores
 - (2) Multiple processors with single cores
 - (3) Multiple processors with multiple cores
 - (4) Single processor with single core
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20. In a 4-to-1 multiplexer, how many input lines can be selected using the control lines ?
- (1) 1
 - (2) 2
 - (3) 3
 - (4) 4

21. Which programming paradigm emphasizes defining computation as the evaluation of mathematical functions and avoids changing state and mutable data ?
- (1) Imperative
 - (2) Declarative
 - (3) Procedural
 - (4) Object-Oriented
22. Which formal model is often used to describe the syntax of programming languages ?
- (1) Finite State Machine (FSM)
 - (2) Turing Machine
 - (3) Context-Free Grammar (CFG)
 - (4) Pushdown Automaton (PDA)
23. Which property of a type allows an object of that type to be modified after its creation ?
- (1) Mutable
 - (2) Immutable
 - (3) Static
 - (4) Dynamic
24. In C programming, what is the purpose of the "typedef" keyword ?
- (1) Declare a new type
 - (2) Define a constant
 - (3) Declare a variable
 - (4) Define a function
25. Which keyword is used in C++ to define a function ?
- (1) method
 - (2) function
 - (3) def
 - (4) define
26. What is the purpose of a destructor in C++ ?
- (1) Initialize an object
 - (2) Perform cleanup tasks when an object goes out of scope
 - (3) Define the structure of a class
 - (4) Overload operators

27. In C++, which keyword is used to handle exceptions ?
- (1) throw
 - (2) catch
 - (3) exception
 - (4) try
28. In 2-D geometrical transforms, what does shear refer to ?
- (1) Changing the position of an object
 - (2) Changing the size of an object
 - (3) Changing the orientation of an object
 - (4) Distorting the shape of an object
29. Which illumination model is commonly used to simulate the interaction of light with surfaces in computer graphics ?
- (1) Flat shading
 - (2) Gouraud shading
 - (3) Phong shading
 - (4) Lambertian shading
30. What is the purpose of using quadric surfaces in 3D object representation ?
- (1) Representing flat surfaces
 - (2) Representing surfaces with complex shapes
 - (3) Representing cubic surfaces
 - (4) Representing polygonal surfaces
31. What is the primary goal of the three-schema architecture in a database system ?
- (1) Data integrity
 - (2) Data independence
 - (3) Data security
 - (4) Data consistency

- 32.** In a client/server architecture for a DBMS, what is the role of the client ?
- (1) Manage database transactions
 - (2) Execute database queries
 - (3) Store and retrieve data
 - (4) Provide database security
- 33.** In an Entity-Relationship Diagram (ERD), what does a diamond shape represent ?
- (1) Entity
 - (2) Attribute
 - (3) Key
 - (4) Relationship
- 34.** What is the role of HDFS (Hadoop Distributed File System) in big data processing ?
- (1) Real-time data analytics
 - (2) Batch processing of large datasets
 - (3) Database querying
 - (4) Streamlining data integration
- 35.** According to Codd's rules for relational databases, what does the third rule ensure ?
- (1) Data independence
 - (2) Data security
 - (3) Data consistency
 - (4) Data integrity
- 36.** In the context of database transactions, what is the purpose of concurrency control ?
- (1) Ensure data consistency
 - (2) Avoid deadlocks
 - (3) Manage transaction isolation
 - (4) Optimize query performance
- 37.** What is the main challenge in managing multimedia databases ?
- (1) Limited storage capacity
 - (2) Complexity of data types
 - (3) Lack of query languages
 - (4) Inability to handle text data

38. What is the primary application of Hidden Markov Models (HMM) in data mining ?
- (1) Classification
 - (2) Regression
 - (3) Time-series analysis
 - (4) Clustering
39. What is the primary function of OLAP (Online Analytical Processing) in data warehousing ?
- (1) Data retrieval for decision support
 - (2) Data entry for transaction processing
 - (3) Data storage for long-term archiving
 - (4) Data encryption for security
40. Which NoSQL database is known for its document-oriented data model ?
- (1) Cassandra
 - (2) MongoDB
 - (3) Couchbase
 - (4) Redis
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 - (2) FAT32
 - (3) Ext4
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 - (3) Compiler
 - (4) Kernel

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- (1) Paging
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 - (2) Enhance file access speed
 - (3) Provide fault tolerance
 - (4) Encrypt data on the storage device
51. Which prescriptive process model is characterized by defining all stages and their specific activities before development begins ?
- (1) Waterfall model
 - (2) Incremental model
 - (3) Spiral model
 - (4) Agile model
52. What is the primary focus of aspect-oriented software development ?
- (1) Data modeling
 - (2) User interface design
 - (3) Separation of concerns
 - (4) Component reuse
53. What is the primary purpose of the Software Requirement Specification (SRS) document ?
- (1) Designing software architecture
 - (2) Coding software modules
 - (3) Documenting user manuals
 - (4) Describing the functional and non-functional requirements of the software
54. Which design principle is focused on minimizing the dependencies between different modules in a software system ?
- (1) Separation of Concerns
 - (2) Modularity
 - (3) Information Hiding
 - (4) Cohesion

55. Which model is *not* a software estimation model ?
- (1) COCOMO
 - (2) Waterfall Model
 - (3) Function Point Analysis
 - (4) LOC-based Estimation
56. What is the primary purpose of Quality Assurance in software development ?
- (1) Identifying and fixing defects
 - (2) Evaluating the performance of the software
 - (3) Managing project risks
 - (4) Ensuring that the software meets specified requirements
57. Which testing technique involves executing the software's functionality without knowledge of its internal code ?
- (1) White-box Testing
 - (2) Black-box Testing
 - (3) Grey-box Testing
 - (4) Glass-box Testing
58. What is Reverse Engineering in the context of software development ?
- (1) The process of creating software from scratch
 - (2) The process of reusing software components
 - (3) The process of understanding and analyzing existing software
 - (4) The process of documenting software code
59. What is a key principle of Extreme Programming (XP) ?
- (1) Heavy documentation
 - (2) Frequent and small releases
 - (3) Sequential development phases
 - (4) Strict adherence to a plan
60. In Scrum, what is the role of the Scrum Master ?
- (1) Managing the development team
 - (2) Ensuring the delivery of features
 - (3) Facilitating the Scrum process and removing impediments
 - (4) Defining project requirements

61. What is the time complexity of searching for an element in a sorted array using binary search ?
- (1) $O(1)$ (2) $O(\log n)$
(3) $O(n)$ (4) $O(n \log n)$
62. In a linked list, what is the term for the node that does not point to any other node ?
- (1) Head (2) Tail
(3) Null node (4) Sentinel node
63. Which algorithm is commonly used for sorting large datasets in external storage ?
- (1) QuickSort (2) MergeSort
(3) BubbleSort (4) InsertionSort
64. In the context of Design Techniques, what is the primary characteristic of a Greedy Algorithm ?
- (1) Backtracking
(2) Divide and Conquer
(3) Optimally solves subproblems
(4) Makes locally optimal choices at each stage with the hope of finding a global optimum
65. Which algorithmic technique is commonly used for optimization problems where the goal is to find the best solution from a set of feasible solutions ?
- (1) Divide and Conquer
(2) Greedy Algorithms
(3) Backtracking
(4) Branch and Bound

66. Maximum Flow is a concept often applied to solve problems related to :
- (1) Network connectivity
 - (2) Shortest paths
 - (3) Sorting algorithms
 - (4) Dynamic programming
67. Which complexity class represents problems that can be solved in polynomial time by a deterministic Turing machine ?
- (1) NP
 - (2) P
 - (3) NP-completeness
 - (4) Exponential
68. What is the primary application of the Fast Fourier Transform (FFT) algorithm in computer science ?
- (1) Sorting
 - (2) String Matching
 - (3) Polynomial Arithmetic
 - (4) Number Theoretic Algorithms
69. What is the primary goal of algorithms designed for NP-completeness and reducibility ?
- (1) Minimize time complexity
 - (2) Maximize space complexity
 - (3) Identify problems that are difficult to solve in polynomial time
 - (4) Solve problems in constant time
70. Approximation Algorithms are often used when :
- (1) Exact solutions are required
 - (2) Problems are NP-complete
 - (3) The problem size is small
 - (4) Polynomial-time solutions are not feasible

71. Russel's Paradox is related to :
- (1) Set theory
 - (2) Graph theory
 - (3) Number theory
 - (4) Formal languages
72. What does the Pumping Lemma for Regular Languages state ?
- (1) All regular languages can be pumped
 - (2) Any sufficiently large regular language can be divided into parts that can be pumped to generate more strings in the language
 - (3) Regular expressions can be pumped to produce additional patterns
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73. The Equivalence of Pushdown Automata (PDA) and Context-Free Grammars is known as :
- (1) Chomsky Normal Form
 - (2) Pumping Lemma
 - (3) Greibach Normal Form
 - (4) Cook-Levin Theorem
74. What type of language is recognized by a Turing Machine in a single head, single tape configuration ?
- (1) Regular language
 - (2) Context-Free language
 - (3) Context-Sensitive language
 - (4) Recursively Enumerable language
75. The Halting Problem is an example of a problem that is :
- (1) Solvable
 - (2) Tractable
 - (3) Unsolvable
 - (4) Context-Free

76. In the context of parsing, which type of parser is LL(1) ?
- (1) Top-down parser
 - (2) Bottom-up parser
 - (3) LR parser
 - (4) LALR(1) parser
77. In the context of Turing Machines, what is the significance of the Universal Turing Machine ?
- (1) It recognizes only regular languages
 - (2) It can simulate any other Turing Machine
 - (3) It is less powerful than a standard Turing Machine
 - (4) It is designed for practical computations
78. What does Peep-Hole Optimization focus on ?
- (1) Global optimization
 - (2) Loop optimization
 - (3) Local optimization
 - (4) Instruction scheduling
79. Instruction Scheduling in code optimization is concerned with :
- (1) Reordering instructions to improve parallelism
 - (2) Adding new instructions for better performance
 - (3) Removing unnecessary instructions
 - (4) Optimizing loops
80. What is the primary goal of the Symbol Table in a compiler's Run Time System ?
- (1) Managing storage organization
 - (2) Storing intermediate code
 - (3) Storing lexical tokens
 - (4) Managing information about identifiers in the source program

- 81.** In the context of transmission media, what is characteristic of Broadband Transmission ?
- (1) High bandwidth and multiple channels
 - (2) Single channel with low bandwidth
 - (3) Limited coverage area
 - (4) Analog signal transmission only
- 82.** What term describes the process of combining multiple signals into a single channel for transmission ?
- (1) Modulation
 - (2) Demodulation
 - (3) Multiplexing
 - (4) Encoding
- 83.** In the OSI Reference Model, which layer is responsible for end-to-end communication and provides services like flow control and error correction ?
- (1) Network Layer
 - (2) Transport Layer
 - (3) Data Link Layer
 - (4) Presentation Layer
- 84.** Which switching technique involves creating a dedicated communication path between two devices for the entire duration of their communication ?
- (1) Circuit Switching
 - (2) Packet Switching
 - (3) Message Switching
 - (4) Virtual Switching
- 85.** In the TCP/IP Protocol Suite, which layer is responsible for logical addressing and routing ?
- (1) Data Link Layer
 - (2) Network Layer
 - (3) Transport Layer
 - (4) Application Layer

86. Which multiple access technique is used in Ethernet networks and involves collision detection ?
- (1) CSMA/CA (2) Token Passing
(3) FDMA (4) CSMA/CD
87. In the context of email communication, which protocol is commonly used for retrieving emails from a mail server ?
- (1) SMTP (2) IMAP
(3) POP (4) HTTP
88. Which type of algorithms use a single key for both encryption and decryption in network security ?
- (1) Public-Key Algorithms (2) Secret-Key Algorithms
(3) Digital Signature (4) Cryptographic Hash Functions
89. What is the primary purpose of a Digital Signature in network security ?
- (1) Ensuring confidentiality of data
(2) Verifying the authenticity and integrity of a message
(3) Hiding information within other information
(4) Preventing malware attacks
90. What is the primary goal of Cloud Computing ?
- (1) Ensuring the privacy of data
(2) Centralized management of local servers
(3) Facilitating collaborative development
(4) Efficient use of physical hardware resources

91. In Rational Agent Approaches to AI, what criterion is used to evaluate the performance of an agent ?

- (1) Execution speed
- (2) Memory utilization
- (3) Rationality
- (4) Complexity of the algorithm

92. In the context of Game Playing, what is the purpose of the Min-Max Search algorithm ?

- (1) Maximizing the number of moves
- (2) Minimizing the number of search nodes
- (3) Maximizing the chances of winning
- (4) Minimizing the opponent's chances of winning

93. In Expert Systems, how is uncertainty in knowledge typically handled ?

- (1) Utilizing deterministic rules
- (2) Relying on probabilistic reasoning
- (3) Avoiding the representation of uncertain knowledge
- (4) Using only factual information

94. Ontologies in knowledge representation refer to :

- (1) Representations of rules
- (2) Formal specifications of procedures
- (3) Hierarchical structures of concepts and relationships
- (4) Frames for knowledge representation

95. Goal Stack Planning is based on :
- (1) Linear programming techniques
 - (2) A stack-based approach to goal achievement
 - (3) Hierarchical decomposition of tasks
 - (4) Nonlinear optimization
96. In Multi-Agent Systems, what is the purpose of Agent Communication ?
- (1) Representing knowledge using ontologies
 - (2) Enabling agents to exchange information
 - (3) Hierarchical decomposition of tasks
 - (4) Planning and scheduling tasks
97. In Fuzzy Control Systems, what does the process of Defuzzification involve ?
- (1) Converting fuzzy input to crisp output
 - (2) Converting crisp input to fuzzy output
 - (3) Combining fuzzy inputs
 - (4) Applying fuzzy rules
98. Which type of learning in Artificial Neural Networks involves learning from a set of labeled input-output pairs ?
- (1) Reinforcement learning
 - (2) Self-organizing learning
 - (3) Supervised learning
 - (4) Unsupervised learning

99. What is the primary goal of the Fuzzy Inference System in Fuzzy Logic ?

- (1) Fuzzification of inputs
- (2) Defuzzification of outputs
- (3) Making decisions based on fuzzy rules
- (4) Combining fuzzy rules

100. What function guides the evolution of solutions in a Genetic Algorithm by measuring the quality of individuals ?

- (1) Crossover
- (2) Mutation
- (3) Encoding strategy
- (4) Fitness function

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 - (4) LALR(1) parser
17. In the context of Turing Machines, what is the significance of the Universal Turing Machine ?
- (1) It recognizes only regular languages
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- (1) Managing storage organization
 - (2) Storing intermediate code
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21. In Rational Agent Approaches to AI, what criterion is used to evaluate the performance of an agent ?
- (1) Execution speed
 - (2) Memory utilization
 - (3) Rationality
 - (4) Complexity of the algorithm
22. In the context of Game Playing, what is the purpose of the Min-Max Search algorithm ?
- (1) Maximizing the number of moves
 - (2) Minimizing the number of search nodes
 - (3) Maximizing the chances of winning
 - (4) Minimizing the opponent's chances of winning

23. In Expert Systems, how is uncertainty in knowledge typically handled ?

- (1) Utilizing deterministic rules
- (2) Relying on probabilistic reasoning
- (3) Avoiding the representation of uncertain knowledge
- (4) Using only factual information

24. Ontologies in knowledge representation refer to :

- (1) Representations of rules
- (2) Formal specifications of procedures
- (3) Hierarchical structures of concepts and relationships
- (4) Frames for knowledge representation

25. Goal Stack Planning is based on :

- (1) Linear programming techniques
- (2) A stack-based approach to goal achievement
- (3) Hierarchical decomposition of tasks
- (4) Nonlinear optimization

26. In Multi-Agent Systems, what is the purpose of Agent Communication ?

- (1) Representing knowledge using ontologies
- (2) Enabling agents to exchange information
- (3) Hierarchical decomposition of tasks
- (4) Planning and scheduling tasks

27. In Fuzzy Control Systems, what does the process of Defuzzification involve ?
- (1) Converting fuzzy input to crisp output
 - (2) Converting crisp input to fuzzy output
 - (3) Combining fuzzy inputs
 - (4) Applying fuzzy rules
28. Which type of learning in Artificial Neural Networks involves learning from a set of labeled input-output pairs ?
- (1) Reinforcement learning
 - (2) Self-organizing learning
 - (3) Supervised learning
 - (4) Unsupervised learning
29. What is the primary goal of the Fuzzy Inference System in Fuzzy Logic ?
- (1) Fuzzification of inputs
 - (2) Defuzzification of outputs
 - (3) Making decisions based on fuzzy rules
 - (4) Combining fuzzy rules
30. What function guides the evolution of solutions in a Genetic Algorithm by measuring the quality of individuals ?
- (1) Crossover
 - (2) Mutation
 - (3) Encoding strategy
 - (4) Fitness function

31. Which of the following is an example of a tautology ?
- (1) $p \text{ AND } \sim p$ (2) $p \text{ OR } \sim p$
(3) $p \text{ XOR } \sim p$ (4) $p \leftrightarrow \sim p$
32. Which property is not necessarily satisfied by an equivalence relation ?
- (1) Reflexivity (2) Symmetry
(3) Transitivity (4) Asymmetry
33. If there are 8 pigeons and 7 pigeonholes, what is guaranteed according to the Pigeonhole Principle ?
- (1) Some pigeonhole is empty.
(2) Some pigeonhole has more than one pigeon.
(3) Each pigeonhole has exactly one pigeon.
(4) Each pigeonhole has at most one pigeon.
34. In cryptography, which concept from group theory is utilized to secure communication through public-key cryptography ?
- (1) Isomorphism (2) Homomorphism
(3) Automorphism (4) Discrete logarithm problem
35. What is the chromatic number of a graph ?
- (1) The minimum number of colors needed to color the vertices of the graph such that no two adjacent vertices have the same color.
(2) The maximum degree of any vertex in the graph.
(3) The minimum degree of any vertex in the graph.
(4) The maximum number of vertices that are pairwise adjacent.

36. Which algebraic structure has both addition and multiplication operations, where multiplication is distributive over addition, and it may not have multiplicative inverses for all elements ?
- (1) Group (2) Ring
(3) Field (4) Integral Domain
37. Which algorithm is commonly used to find the shortest path between two vertices in a weighted graph ?
- (1) Breadth-First Search (BFS) (2) Depth-First Search (DFS)
(3) Dijkstra's algorithm (4) Kruskal's algorithm
38. What does the expression $\forall x \exists y P(x, y)$ mean in terms of nested quantifiers ?
- (1) There exists an x such that for every y , $P(x, y)$ is true.
(2) For every x , there exists a y such that $P(x, y)$ is true.
(3) There exists an x and a y such that $P(x, y)$ is true.
(4) For every x and y , $P(x, y)$ is true.
39. Which rule of inference is represented by the statement "p implies q, and p is true, therefore q is true" ?
- (1) Modus Ponens (2) Modus Tollens
(3) Hypothetical Syllogism (4) Disjunctive Syllogism
40. If $C = A \cap B$, what is the complement of set C with respect to the universal set U ?
- (1) $A \cap B$ (2) $A \cup B$
(3) $A - B$ (4) $A' \cup B'$

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 - (4) Defining project requirements

51. What is the time complexity of searching for an element in a sorted array using binary search ?
- (1) $O(1)$ (2) $O(\log n)$
(3) $O(n)$ (4) $O(n \log n)$
52. In a linked list, what is the term for the node that does not point to any other node ?
- (1) Head (2) Tail
(3) Null node (4) Sentinel node
53. Which algorithm is commonly used for sorting large datasets in external storage ?
- (1) QuickSort (2) MergeSort
(3) BubbleSort (4) InsertionSort
54. In the context of Design Techniques, what is the primary characteristic of a Greedy Algorithm ?
- (1) Backtracking
(2) Divide and Conquer
(3) Optimally solves subproblems
(4) Makes locally optimal choices at each stage with the hope of finding a global optimum
55. Which algorithmic technique is commonly used for optimization problems where the goal is to find the best solution from a set of feasible solutions ?
- (1) Divide and Conquer
(2) Greedy Algorithms
(3) Backtracking
(4) Branch and Bound

56. Maximum Flow is a concept often applied to solve problems related to :
- (1) Network connectivity
 - (2) Shortest paths
 - (3) Sorting algorithms
 - (4) Dynamic programming
57. Which complexity class represents problems that can be solved in polynomial time by a deterministic Turing machine ?
- (1) NP
 - (2) P
 - (3) NP-completeness
 - (4) Exponential
58. What is the primary application of the Fast Fourier Transform (FFT) algorithm in computer science ?
- (1) Sorting
 - (2) String Matching
 - (3) Polynomial Arithmetic
 - (4) Number Theoretic Algorithms
59. What is the primary goal of algorithms designed for NP-completeness and reducibility ?
- (1) Minimize time complexity
 - (2) Maximize space complexity
 - (3) Identify problems that are difficult to solve i-n polynomial time
 - (4) Solve problems in constant time
60. Approximation Algorithms are often used when :
- (1) Exact solutions are required
 - (2) Problems are NP-complete
 - (3) The problem size is small
 - (4) Polynomial-time solutions are not feasible

61. Which programming paradigm emphasizes defining computation as the evaluation of mathematical functions and avoids changing state and mutable data ?
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 - (4) To store permanent data
75. What is the primary advantage of pipelining in computer architecture ?
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 - (2) Faster clock speed
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- 76.** What is the purpose of DMA (Direct Memory Access) in computer systems ?
- (1) Execute arithmetic operations
 - (2) Manage input-output operations
 - (3) Transfer data between main memory and auxiliary memory
 - (4) Control the flow of data within the CPU
- 77.** What is the role of cache memory in the memory hierarchy ?
- (1) Store permanent data
 - (2) Provide fast access to frequently used data
 - (3) Manage input-output operations
 - (4) Control the flow of data within the CPU
- 78.** What is a characteristic feature of a multicore processor ?
- (1) Single processor with multiple cores
 - (2) Multiple processors with single cores
 - (3) Multiple processors with multiple cores
 - (4) Single processor with single core
- 79.** What is the primary characteristic of combinational circuits ?
- (1) Feedback
 - (2) Memory elements
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- 80.** In a 4-to-1 multiplexer, how many input lines can be selected using the control lines ?
- (1) 1
 - (2) 2
 - (3) 3
 - (4) 4

81. In the context of transmission media, what is characteristic of Broadband Transmission ?
- (1) High bandwidth and multiple channels
 - (2) Single channel with low bandwidth
 - (3) Limited coverage area
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82. What term describes the process of combining multiple signals into a single channel for transmission ?
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83. In the OSI Reference Model, which layer is responsible for end-to-end communication and provides services like flow control and error correction ?
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B

91. What is the primary goal of the three-schema architecture in a database system ?
- (1) Data integrity
 - (2) Data independence
 - (3) Data security
 - (4) Data consistency
92. In a client/server architecture for a DBMS, what is the role of the client ?
- (1) Manage database transactions
 - (2) Execute database queries
 - (3) Store and retrieve data
 - (4) Provide database security
93. In an Entity-Relationship Diagram (ERD), what does a diamond shape represent ?
- (1) Entity
 - (2) Attribute
 - (3) Key
 - (4) Relationship
94. What is the role of HDFS (Hadoop Distributed File System) in big data processing ?
- (1) Real-time data analytics
 - (2) Batch processing of large datasets
 - (3) Database querying
 - (4) Streamlining data integration
95. According to Codd's rules for relational databases, what does the third rule ensure ?
- (1) Data independence
 - (2) Data security
 - (3) Data consistency
 - (4) Data integrity
96. In the context of database transactions, what is the purpose of concurrency control ?
- (1) Ensure data consistency
 - (2) Avoid deadlocks
 - (3) Manage transaction isolation
 - (4) Optimize query performance

97. What is the main challenge in managing multimedia databases ?
- (1) Limited storage capacity
 - (2) Complexity of data types
 - (3) Lack of query languages
 - (4) Inability to handle text data
98. What is the primary application of Hidden Markov Models (HMM) in data mining ?
- (1) Classification
 - (2) Regression
 - (3) Time-series analysis
 - (4) Clustering
99. What is the primary function of OLAP (Online Analytical Processing) in data warehousing ?
- (1) Data retrieval for decision support
 - (2) Data entry for transaction processing
 - (3) Data storage for long-term archiving
 - (4) Data encryption for security
100. Which NoSQL database is known for its document-oriented data model ?
- (1) Cassandra
 - (2) MongoDB
 - (3) Couchbase
 - (4) Redis

(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU
ARE ASKED TO DO SO)

C

PHD-EE-2023-24

Computer Science

SET-X

10015

Sr. No.

Time : 1½ Hours

Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (in words) _____

Name _____ Date of Birth _____

Father's Name _____ Mother's Name _____

Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

**CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE
STARTING THE QUESTION PAPER.**

1. **All questions are compulsory.**
2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
5. The candidate **must not** do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers **must not** be ticked in the question booklet.
6. **There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
7. Use only **Black or Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
8. **Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.**

PHD-EE-2023-24/(Computer Sc.)/(SET-X)/(C)

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- (1) CSMA/CA (2) Token Passing
(3) FDMA (4) CSMA/CD
27. In the context of email communication, which protocol is commonly used for retrieving emails from a mail server ?
- (1) SMTP (2) IMAP
(3) POP (4) HTTP

28. Which type of algorithms use a single key for both encryption and decryption in network security ?
- (1) Public-Key Algorithms
 - (2) Secret-Key Algorithms
 - (3) Digital Signature
 - (4) Cryptographic Hash Functions
29. What is the primary purpose of a Digital Signature in network security ?
- (1) Ensuring confidentiality of data
 - (2) Verifying the authenticity and integrity of a message
 - (3) Hiding information within other information
 - (4) Preventing malware attacks
30. What is the primary goal of Cloud Computing ?
- (1) Ensuring the privacy of data
 - (2) Centralized management of local servers
 - (3) Facilitating collaborative development
 - (4) Efficient use of physical hardware resources
31. Russel's Paradox is related to :
- (1) Set theory
 - (2) Graph theory
 - (3) Number theory
 - (4) Formal languages
32. What does the Pumping Lemma for Regular Languages state ?
- (1) All regular languages can be pumped
 - (2) Any sufficiently large regular language can be divided into parts that can be pumped to generate more strings in the language
 - (3) Regular expressions can be pumped to produce additional patterns
 - (4) Pumping is not applicable to regular languages

- 33. The Equivalence of Pushdown Automata (PDA) and Context-Free Grammars is known as :**
- (1) Chomsky Normal Form (2) Pumping Lemma
(3) Greibach Normal Form (4) Cook-Levin Theorem
- 34. What type of language is recognized by a Turing Machine in a single head, single tape configuration ?**
- (1) Regular language (2) Context-Free language
(3) Context-Sensitive language (4) Recursively Enumerable language
- 35. The Halting Problem is an example of a problem that is :**
- (1) Solvable (2) Tractable
(3) Unsolvable (4) Context-Free
- 36. In the context of parsing, which type of parser is LL(1) ?**
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 - (4) Control the flow of data within the CPU

- 47. What is the role of cache memory in the memory hierarchy ?**
- (1) Store permanent data
 - (2) Provide fast access to frequently used data
 - (3) Manage input-output operations
 - (4) Control the flow of data within the CPU
- 48. What is a characteristic feature of a multicore processor ?**
- (1) Single processor with multiple cores
 - (2) Multiple processors with single cores
 - (3) Multiple processors with multiple cores
 - (4) Single processor with single core
- 49. What is the primary characteristic of combinational circuits ?**
- (1) Feedback
 - (2) Memory elements
 - (3) Sequential operation
 - (4) No feedback
- 50. In a 4-to-1 multiplexer, how many input lines can be selected using the control lines ?**
- (1) 1
 - (2) 2
 - (3) 3
 - (4) 4
- 51. What is the primary goal of the three-schema architecture in a database system ?**
- (1) Data integrity
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 - (3) Data security
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61. Which of the following is an example of a tautology ?
- (1) $p \text{ AND } \sim p$
 - (2) $p \text{ OR } \sim p$
 - (3) $p \text{ XOR } \sim p$
 - (4) $p \leftrightarrow \sim p$
62. Which property is not necessarily satisfied by an equivalence relation ?
- (1) Reflexivity
 - (2) Symmetry
 - (3) Transitivity
 - (4) Asymmetry

63. If there are 8 pigeons and 7 pigeonholes, what is guaranteed according to the Pigeonhole Principle ?
- (1) Some pigeonhole is empty.
 - (2) Some pigeonhole has more than one pigeon.
 - (3) Each pigeonhole has exactly one pigeon.
 - (4) Each pigeonhole has at most one pigeon.
64. In cryptography, which concept from group theory is utilized to secure communication through public-key cryptography ?
- (1) Isomorphism
 - (2) Homomorphism
 - (3) Automorphism
 - (4) Discrete logarithm problem
65. What is the chromatic number of a graph ?
- (1) The minimum number of colors needed to color the vertices of the graph such that no two adjacent vertices have the same color.
 - (2) The maximum degree of any vertex in the graph.
 - (3) The minimum degree of any vertex in the graph.
 - (4) The maximum number of vertices that are pairwise adjacent.
66. Which algebraic structure has both addition and multiplication operations, where multiplication is distributive over addition, and it may not have multiplicative inverses for all elements ?
- (1) Group
 - (2) Ring
 - (3) Field
 - (4) Integral Domain

67. Which algorithm is commonly used to find the shortest path between two vertices in a weighted graph ?
- (1) Breadth-First Search (BFS) (2) Depth-First Search (DFS)
(3) Dijkstra's algorithm (4) Kruskal's algorithm
68. What does the expression $\forall x \exists y P(x, y)$ mean in terms of nested quantifiers ?
- (1) There exists an x such that for every y , $P(x, y)$ is true.
(2) For every x , there exists a y such that $P(x, y)$ is true.
(3) There exists an x and a y such that $P(x, y)$ is true.
(4) For every x and y , $P(x, y)$ is true.
69. Which rule of inference is represented by the statement "p implies q, and p is true, therefore q is true" ?
- (1) Modus Ponens (2) Modus Tollens
(3) Hypothetical Syllogism (4) Disjunctive Syllogism
70. If $C = A \cap B$, what is the complement of set C with respect to the universal set U ?
- (1) $A \cap B$ (2) $A \cup B$
(3) $A - B$ (4) $A' \cup B'$
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- (1) Utilizing deterministic rules
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C

84. Ontologies in knowledge representation refer to :

- (1) Representations of rules
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- (1) Converting fuzzy input to crisp output
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D

SET-X

PHD-EE-2023-24
Computer Science

10016

Sr. No.

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Max. Marks : 100

Total Questions : 100

Roll No. (in figures) _____ (in words) _____

Name _____ Date of Birth _____

Father's Name _____ Mother's Name _____

Date of Examination _____

(Signature of the Candidate)

(Signature of the Invigilator)

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2. The candidates **must return** the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfair-means / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
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6. **There will be no negative marking. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.**
7. Use only **Black or Blue Ball Point Pen** of good quality in the OMR Answer-Sheet.
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PHD-EE-2023-24/(Computer Sc.)(SET-X)/(D)

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21. Russel's Paradox is related to :

- (1) Set theory
- (2) Graph theory
- (3) Number theory
- (4) Formal languages

22. What does the Pumping Lemma for Regular Languages state ?

- (1) All regular languages can be pumped
- (2) Any sufficiently large regular language can be divided into parts that can be pumped to generate more strings in the language
- (3) Regular expressions can be pumped to produce additional patterns
- (4) Pumping is not applicable to regular languages

23. The Equivalence of Pushdown Automata (PDA) and Context-Free Grammars is known as :

- (1) Chomsky Normal Form
- (2) Pumping Lemma
- (3) Greibach Normal Form
- (4) Cook-Levin Theorem

24. What type of language is recognized by a Turing Machine in a single head, single tape configuration ?

- (1) Regular language
- (2) Context-Free language
- (3) Context-Sensitive language
- (4) Recursively Enumerable language

25. The Halting Problem is an example of a problem that is :

- (1) Solvable
- (2) Tractable
- (3) Unsolvable
- (4) Context-Free

26. In the context of parsing, which type of parser is LL(1) ?

- (1) Top-down parser
- (2) Bottom-up parser
- (3) LR parser
- (4) LALR(1) parser

27. In the context of Turing Machines, what is the significance of the Universal Turing Machine ?

- (1) It recognizes only regular languages
- (2) It can simulate any other Turing Machine
- (3) It is less powerful than a standard Turing Machine
- (4) It is designed for practical computations

28. What does Peep-Hole Optimization focus on ?

- (1) Global optimization
- (2) Loop optimization
- (3) Local optimization
- (4) Instruction scheduling

29. Instruction Scheduling in code optimization is concerned with :
- (1) Reordering instructions to improve parallelism
 - (2) Adding new instructions for better performance
 - (3) Removing unnecessary instructions
 - (4) Optimizing loops
30. What is the primary goal of the Symbol Table in a compiler's Run Time System ?
- (1) Managing storage organization
 - (2) Storing intermediate code
 - (3) Storing lexical tokens
 - (4) Managing information about identifiers in the source program
31. Which programming paradigm emphasizes defining computation as the evaluation of mathematical functions and avoids changing state and mutable data ?
- (1) Imperative
 - (2) Declarative
 - (3) Procedural
 - (4) Object-Oriented
32. Which formal model is often used to describe the syntax of programming languages ?
- (1) Finite State Machine (FSM)
 - (2) Turing Machine
 - (3) Context-Free Grammar (CFG)
 - (4) Pushdown Automaton (PDA)
33. Which property of a type allows an object of that type to be modified after its creation ?
- (1) Mutable
 - (2) Immutable
 - (3) Static
 - (4) Dynamic

34. In C programming, what is the purpose of the "typedef" keyword ?
- (1) Declare a new type
 - (2) Define a constant
 - (3) Declare a variable
 - (4) Define a function
35. Which keyword is used in C++ to define a function ?
- (1) method
 - (2) function
 - (3) def
 - (4) define
36. What is the purpose of a destructor in C++ ?
- (1) Initialize an object
 - (2) Perform cleanup tasks when an object goes out of scope
 - (3) Define the structure of a class
 - (4) Overload operators
37. In C++, which keyword is used to handle exceptions ?
- (1) throw
 - (2) catch
 - (3) exception
 - (4) try
38. In 2-D geometrical transforms, what does shear refer to ?
- (1) Changing the position of an object
 - (2) Changing the size of an object
 - (3) Changing the orientation of an object
 - (4) Distorting the shape of an object
39. Which illumination model is commonly used to simulate the interaction of light with surfaces in computer graphics ?
- (1) Flat shading
 - (2) Gouraud shading
 - (3) Phong shading
 - (4) Lambertian shading

40. What is the purpose of using quadric surfaces in 3D object representation ?
- (1) Representing flat surfaces
 - (2) Representing surfaces with complex shapes
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51. In the context of transmission media, what is characteristic of Broadband Transmission ?

- (1) High bandwidth and multiple channels
- (2) Single channel with low bandwidth
- (3) Limited coverage area
- (4) Analog signal transmission only

52. What term describes the process of combining multiple signals into a single channel for transmission ?

- (1) Modulation
- (2) Demodulation
- (3) Multiplexing
- (4) Encoding

53. In the OSI Reference Model, which layer is responsible for end-to-end communication and provides services like flow control and error correction ?

- (1) Network Layer
- (2) Transport Layer
- (3) Data Link Layer
- (4) Presentation Layer

54. Which switching technique involves creating a dedicated communication path between two devices for the entire duration of their communication ?

- (1) Circuit Switching
- (2) Packet Switching
- (3) Message Switching
- (4) Virtual Switching

55. In the TCP/IP Protocol Suite, which layer is responsible for logical addressing and routing ?

(1) Data Link Layer

(2) Network Layer

(3) Transport Layer

(4) Application Layer

56. Which multiple access technique is used in Ethernet networks and involves collision detection ?

(1) CSMA/CA

(2) Token Passing

(3) FDMA

(4) CSMA/CD

57. In the context of email communication, which protocol is commonly used for retrieving emails from a mail server ?

(1) SMTP

(2) IMAP

(3) POP

(4) HTTP

58. Which type of algorithms use a single key for both encryption and decryption in network security ?

(1) Public-Key Algorithms

(2) Secret-Key Algorithms

(3) Digital Signature

(4) Cryptographic Hash Functions

59. What is the primary purpose of a Digital Signature in network security ?

(1) Ensuring confidentiality of data

(2) Verifying the authenticity and integrity of a message

(3) Hiding information within other information

(4) Preventing malware attacks

D

60. What is the primary goal of Cloud Computing ?

- (1) Ensuring the privacy of data
- (2) Centralized management of local servers
- (3) Facilitating collaborative development
- (4) Efficient use of physical hardware resources

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 - (3) Provide fault tolerance
 - (4) Encrypt data on the storage device

71. Which prescriptive process model is characterized by defining all stages and their specific activities before development begins ?
- (1) Waterfall model
 - (2) Incremental model
 - (3) Spiral model
 - (4) Agile model
72. What is the primary focus of aspect-oriented software development ?
- (1) Data modeling
 - (2) User interface design
 - (3) Separation of concerns
 - (4) Component reuse
73. What is the primary purpose of the Software Requirement Specification (SRS) document ?
- (1) Designing software architecture
 - (2) Coding software modules
 - (3) Documenting user manuals
 - (4) Describing the functional and non-functional requirements of the software
74. Which design principle is focused on minimizing the dependencies between different modules in a software system ?
- (1) Separation of Concerns
 - (2) Modularity
 - (3) Information Hiding
 - (4) Cohesion
75. Which model is *not* a software estimation model ?
- (1) COCOMO
 - (2) Waterfall Model
 - (3) Function Point Analysis
 - (4) LOC-based Estimation

76. What is the primary purpose of Quality Assurance in software development ?
- (1) Identifying and fixing defects
 - (2) Evaluating the performance of the software
 - (3) Managing project risks
 - (4) Ensuring that the software meets specified requirements
77. Which testing technique involves executing the software's functionality without knowledge of its internal code ?
- (1) White-box Testing
 - (2) Black-box Testing
 - (3) Grey-box Testing
 - (4) Glass-box Testing
78. What is Reverse Engineering in the context of software development ?
- (1) The process of creating software from scratch
 - (2) The process of reusing software components
 - (3) The process of understanding and analyzing existing software
 - (4) The process of documenting software code
79. What is a key principle of Extreme Programming (XP) ?
- (1) Heavy documentation
 - (2) Frequent and small releases
 - (3) Sequential development phases
 - (4) Strict adherence to a plan
80. In Scrum, what is the role of the Scrum Master ?
- (1) Managing the development team
 - (2) Ensuring the delivery of features
 - (3) Facilitating the Scrum process and removing impediments
 - (4) Defining project requirements

81. Which of the following is an example of a tautology ?
- (1) $p \text{ AND } \sim p$ (2) $p \text{ OR } \sim p$
(3) $p \text{ XOR } \sim p$ (4) $p \leftrightarrow \sim p$
82. Which property is not necessarily satisfied by an equivalence relation ?
- (1) Reflexivity (2) Symmetry
(3) Transitivity (4) Asymmetry
83. If there are 8 pigeons and 7 pigeonholes, what is guaranteed according to the Pigeonhole Principle ?
- (1) Some pigeonhole is empty.
(2) Some pigeonhole has more than one pigeon.
(3) Each pigeonhole has exactly one pigeon.
(4) Each pigeonhole has at most one pigeon.
84. In cryptography, which concept from group theory is utilized to secure communication through public-key cryptography ?
- (1) Isomorphism (2) Homomorphism
(3) Automorphism (4) Discrete logarithm problem
85. What is the chromatic number of a graph ?
- (1) The minimum number of colors needed to color the vertices of the graph such that no two adjacent vertices have the same color.
(2) The maximum degree of any vertex in the graph.
(3) The minimum degree of any vertex in the graph.
(4) The maximum number of vertices that are pairwise adjacent.

86. Which algebraic structure has both addition and multiplication operations, where multiplication is distributive over addition, and it may not have multiplicative inverses for all elements ?
- (1) Group (2) Ring
(3) Field (4) Integral Domain
87. Which algorithm is commonly used to find the shortest path between two vertices in a weighted graph ?
- (1) Breadth-First Search (BFS) (2) Depth-First Search (DFS)
(3) Dijkstra's algorithm (4) Kruskal's algorithm
88. What does the expression $\forall x \exists y P(x, y)$ mean in terms of nested quantifiers ?
- (1) There exists an x such that for every y , $P(x, y)$ is true.
(2) For every x , there exists a y such that $P(x, y)$ is true.
(3) There exists an x and a y such that $P(x, y)$ is true.
(4) For every x and y , $P(x, y)$ is true.
89. Which rule of inference is represented by the statement "p implies q, and p is true, therefore q is true" ?
- (1) Modus Ponens (2) Modus Tollens
(3) Hypothetical Syllogism (4) Disjunctive Syllogism
90. If $C = A \cap B$, what is the complement of set C with respect to the universal set U ?
- (1) $A \cap B$ (2) $A \cup B$
(3) $A - B$ (4) $A' \cup B'$

D

91. What is the primary characteristic of combinational circuits ?
- (1) Feedback
 - (2) Memory elements
 - (3) Sequential operation
 - (4) No feedback
92. What is the purpose of a shift microoperation ?
- (1) Transfer data from one register to another
 - (2) Shift bits within a register
 - (3) Perform arithmetic operations
 - (4) Move data within a register
93. What is the primary function of the control unit in a computer ?
- (1) Execute arithmetic operations
 - (2) Manage input-output operations
 - (3) Control the flow of data within the CPU
 - (4) Manage the memory hierarchy
94. In a general register organization, what are the registers used for ?
- (1) To store program instructions
 - (2) To store intermediate data during program execution
 - (3) To manage input-output operations
 - (4) To store permanent data
95. What is the primary advantage of pipelining in computer architecture ?
- (1) Improved instruction set
 - (2) Faster clock speed
 - (3) Increased throughput
 - (4) Reduced power consumption

96. What is the purpose of DMA (Direct Memory Access) in computer systems ?
- (1) Execute arithmetic operations
 - (2) Manage input-output operations
 - (3) Transfer data between main memory and auxiliary memory
 - (4) Control the flow of data within the CPU
97. What is the role of cache memory in the memory hierarchy ?
- (1) Store permanent data
 - (2) Provide fast access to frequently used data
 - (3) Manage input-output operations
 - (4) Control the flow of data within the CPU
98. What is a characteristic feature of a multicore processor ?
- (1) Single processor with multiple cores
 - (2) Multiple processors with single cores
 - (3) Multiple processors with multiple cores
 - (4) Single processor with single core
99. What is the primary characteristic of combinational circuits ?
- | | |
|--------------------------|---------------------|
| (1) Feedback | (2) Memory elements |
| (3) Sequential operation | (4) No feedback |
100. In a 4-to-1 multiplexer, how many input lines can be selected using the control lines ?
- | | |
|-------|-------|
| (1) 1 | (2) 2 |
| (3) 3 | (4) 4 |

Answer keys of PHD-EE-2023-24 (COMPUTER SCIENCE) entrance exam dated 22.03.2024

Q. NO.	A	B	C	D
1	2	3	2	3
2	4	3	3	4
3	2	2	1	2
4	4	3	1	3
5	1	4	2	2
6	2	2	2	2
7	3	2	4	1
8	2	4	4	4
9	1	3	3	3
10	4	3	2	4
11	4	1	1	2
12	2	2	3	2
13	3	1	4	4
14	2	4	2	2
15	3	3	2	4
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20	4	4	3	2
21	2	3	1	1
22	3	4	3	2
23	1	2	2	1
24	1	3	1	4
25	2	2	2	3
26	2	2	4	1
27	4	1	3	2
28	4	4	2	3
29	3	3	2	1
30	2	4	4	4
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36	3	2	1	2
37	2	3	2	4
38	3	2	3	4
39	1	1	1	3
40	2	4	4	2
41	3	1	4	2
42	3	3	2	3
43	2	4	3	2
44	3	2	2	4
45	4	2	3	2
46	2	4	3	1
47	2	2	2	2
48	4	3	3	3
49	3	2	4	3
50	3	3	4	4

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22/03/24

Answer keys of PHD-EE-2023-24 (COMPUTER SCIENCE) entrance exam dated 22.03.2024

Q. NO.	A	B	C	D
51	1	2	2	1
52	3	3	2	3
53	4	2	4	2
54	2	4	2	1
55	2	2	4	2
56	4	1	3	4
57	2	2	2	3
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59	2	3	1	2
60	3	4	2	4
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64	4	1	4	3
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90	4	4	4	4
91	3	2	2	4
92	4	2	3	2
93	2	4	2	3
94	3	2	4	2
95	2	4	2	3
96	2	3	1	3
97	1	2	2	2
98	4	3	3	3
99	3	1	3	4
100	4	2	4	4

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