Reg No.:_____

Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth Semester B.Tech Degree (R, S) Examination May 2024 (2019 Scheme)

Course Code: ADT308

Course name: COMPREHENSIVE COURSE WORK

Max. Marks: 50

Duration: 1Hour

(1) Each question carries one mark. No negative marks for wrong answers
(2) Total number of questions: 50
(3) All questions are to be answered. Each question will be followed by 4 possible answers of
which only ONE is correct.
(4) If more than one option is chosen, it will not be considered for valuation.

1   Which of the following is NOT a valid deadlock prevention scheme?

a) Release all resources before requesting a new resource

b) Number the resources uniquely and never request a lower numbered resource than the last one requested.

c) Never request a resource after releasing any resource

d) Request and all required resources be allocated before execution.

2   Consider a virtual memory system with FIFO page replacement policy. For an arbitrary page access pattern, increasing the number of page frames in main memory will

a) Always decrease the number of page faults

b) Always increase the number of page faults

c) Some times increase the number of page faults

d) Never affect the number of page faults

3   Suppose the time to service a page fault is on the average 10 milliseconds, while a memory access takes 1 microsecond. Then a 99.99% hit ratio results in average memory access time of

a) 1.9999 milliseconds

b) 1 millisecond

c) 9.999 microseconds

d) 1.9999 microseconds

4   Which of the following scheduling algorithms is non-preemptive?

a) Round Robin

b) First-In First-Out

c) Multilevel Queue Scheduling

d) Multilevel Queue Scheduling with Feedback

13 A standard circular Queue 'q' implemented whose size is 11 from 0 to 10. The front & rear pointers start to point at q[2]. The ninth element be added at which position?

    a) q[0]   b) q[1]   c) q[9]   d) q[10]

14 The preorder traversal of a binary search tree is 15, 10, 12, 11, 20, 18, 16, 19. Which one of the following is the postorder traversal of the tree?

    a) 11,12,10,16,1   b) 20,19,18,16,15,1   c) 10,11,12,15,16   d) 19,16,18,20,11,
    9,18,20,15   2,11,10   ,18,19,20   12,10,15

15 A hash table contains 10 buckets and uses linear probing to resolve collisions. The key values are integers and the hash function used is key % 10. If the values 43, 165, 62, 123, 142 are inserted in the table, in what location would the key value 142 be inserted?

    a) 2   b) 3   c) 4   d) 6

16 Let P be a singly linked list, Let Q be the pointer to an intermediate node x in the list.What is the worst-case time complexity of the best known algorithm to delete the node x from the list?

    a) O(n)   b) O(n log n)   c) O(1)   d) None of these

17 The result evaluating the postfix expression is: 10 5 + 60 6 / .* 8 -

    a) 284   b) 213   c) 142   d) 71

18 The best data structure to check whether an arithmetic expression has balanced parentheses is a

    a) Stack   b) Queue   c) Tree   d) List

19 In a depth-first traversal of a graph G with n vertices,k edges are marked as tree edges. The number of connected components in G is

    a) K   b) k+1   c) n-k   d) n-k-1

20 What is the maximum number of swaps that can be performed in the Selection Sort algorithm?

    a) n-1   b) n   c) 1   d) n-2

21 Which one of the options given below refers to the degree of a relation in relational database systems?

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21 Which one of the options given below refers to the degree of a relation in relational database systems?

| a) Number of attributes of its relation schema. | b) Number of tuples stored in the relation. | c) Number of entries in the relation. | d) Number of distinct domains of its relation schema. |

22   Which of the following statements is/are TRUE with respect to deadlocks?

| a) Circular wait is a necessary condition for the formation of deadlock | b) In a system where each resource has more than one instance, a cycle in its wait-for graph indicates the presence of a deadlock | c) If the current allocation of resources to processes leads the system to unsafe state, then deadlock will necessarily occur | d) None of these |

23   In SQL, which of the following is an aggregate function?

| a) Avg | b) Select | c) Ordered by | d) Distinct |

24   Which of the following is generally used for performing tasks like creating the structure of the relations, deleting relation?

| a) DML | b) Query | c) Relational Schema | d) DDL |

25   Which one of the following given statements possibly contains the error?

| a) select * from emp where empid = 10003; | b) select empid from emp where empid = 10006; | c) select empid from emp; | d) select empid where empid = 1009 and Lastname = 'GELLER'; |

26   A Database Management System is a type of _____software.

| a) It is a type of system software | b) It is a kind of application software | c) It is a kind of general software | d) None of these |

27   Which of the following is a top-down approach in which the entity's higher level can be divided into two lower sub-entities?

| a) Aggregation | b) Generalization | c) Specialization | d) None of these |

28   Which one of the following refers to the total view of the database content?

| a) Conceptual view | b) Physical view | c) Internal view | d) None of these |

29 Which of the following statements is correct?
1. A self-join may be implemented in SQL using table aliases.
2. The outer-join operation is a fundamental relational algebra procedure.
3. The procedures of natural join and outside join are the same.

a) 1 is correct   b) 1 and 2 is correct   c) 2 and 3 is correct   d) None of these

30 Location transparency in distributed databases allows database users, programmers, and administrators to handle data as if it were stored in a single location. A SQL query with location transparency must provide the following information:

a) Fragments   b) Locations   c) Local formats   d) Inheritances

31 Which algorithm is used for finding frequent itemsets in transactional databases?

a) Decision Trees   b) K-Means clustering   c) Apriori algorithm   d) Support Vector Machines (SVM)

32 In the context of machine learning, what is the term "bias-variance trade-off" referring to?

a) The trade-off between the quality of training data and testing data   b) The trade-off between the complexity of a model and its ability to generalize   c) The trade-off between the number of features and the size of the dataset   d) The trade-off between precision and recall in classification

33 Which algorithm is used for hierarchical clustering?

a) K-Means clustering   b) Agglomerative clustering   c) DBSCAN   d) PCA

34 Which method can be used to handle missing data in a dataset?

a) Removing the entire column with missing data   b) Replacing missing data with the median value of the column   c) Ignoring the rows with missing data during analysis   d) All of the above

35 Which technique is used to combat the vanishing gradient problem in deep neural networks?

a) ReLU activation function   b) Sigmoid activation function   c) Tanh activation function   d) Batch normalization

36 In the context of Support Vector Machines (SVM), what is the "kernel trick"?

a)	A technique to add more features to the dataset	b)	A method to increase the regularization term	c)	A way to perform dimensionality reduction	d)	A way to implicitly map data to higher-dimensional spaces

37   What is the purpose of regularization in linear regression?

a)	To make the model more complex	b)	To avoid underfitting	c)	To encourage overfitting	d)	To reduce the complexity of the model

38   K-Nearest Neighbors (KNN) is classified as what type of machine learning algorithm?

a)	Instance-based learning	b)	Parametric learning	c)	Non-parametric learning	d)	Model-based learning

39   Which of the following is not a supervised machine learning algorithm?

a)	K-means	b)	Naive Bayes	c)	SVM	d)	Decision Tree

40   Which of the following statements is not true about boosting?

a)	It mainly increases the bias and the variance	b)	It mainly decreases the bias and the variance	c)	It is a technique for solving two-class classification problems	d)	None of these

41   Ensemble learning is a machine learning technique that involves:

a)	Training multiple models and combining their predictions	b)	Training a single model on a large dataset	c)	Training a model using a deep neural network	d)	Training a model using reinforcement learning

42   Which ensemble learning algorithm assigns weights to base models based on their performance?

a)	AdaBoost	b)	Random Forest	c)	Gradient Boosting	d)	Stacking

43   Which of the following statement is not true about Naïve Bayes classifier algorithm?

a) It cannot be used for Binary as well as multi-class classifications	b) It is the most popular choice for text classification problems	c) It performs well in Multi-class prediction as compared to other algorithms	d) It is one of the fast and easy machine learning algorithms to predict a class of test datasets

44 Which one of the following models is a generative model used in machine learning?

a) Linear Regression	b) Logistic Regression	c) Naïve Bayes	d) Support vector machines

45 Which of the following can be considered as the classification or mapping of a set or class with some predefined group or classes?

a) Data set	b) Data Characterization	c) Data Sub Structure	d) Data Discrimination

46 In order to integrate heterogeneous databases, how many types of approaches are there in the data warehousing?

a) 1	b) 2	c) 3	d) 4

47 Which of the following is generally used by the E-R model to represent the weak entities?

a) Diamond	b) Doubly outlined rectangle	c) Dotted rectangle	d) Both B & C

48 Which of the following is finally produced by Hierarchical Clustering?

a) Final estimate of cluster centroids	b) Tree showing how close things are to each other	c) Assignment of each point to clusters	d) All of the above

49 Which clustering algorithm is suitable for high-dimensional data?

a) K-Means	b) DBSCAN	c) Agglomerative	d) Mean-Shift

50 Which of the following statements is not true about Random forests?

a) It has high complexity	b) Construction of Random forests are much easier than decision trees	c) Construction of Random forests are time-consuming than decision trees	d) More computational resources are required to implement Random Forest algorithm

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