

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (R,S) Examinations April 2026 (2019 Scheme)



Course Code: ADT308

Course name: COMPREHENSIVE COURSE WORK

Max. Marks: 50

Duration: 1 Hour

- Instructions:**
- (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. You are given reviews of few Netflix series marked as positive, negative and neutral. Classifying reviews of a new Netflix series is an example of
 - a) Supervised learning
 - b) Unsupervised learning
 - c) Semi supervised learning
 - d) Reinforcement learning
2. Following are the types of supervised learning
 - a) Classification
 - b) Regression
 - c) subgroup discovery
 - d) all of the above
3. The output of training process in machine learning is
 - a) machine learning model
 - b) machine learning algorithm
 - c) null
 - d) accuracy
4. PCA is
 - a) forward feature selection
 - b) backward feature selection
 - c) feature extraction
 - d) all of the above
5. Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging?
 - a) Random Forest
 - b) Regression
 - c) Classification
 - d) Decision Tree
6. Which of the following is a supervised learning algorithm?
 - a) K-means
 - b) Naive Bayes
 - c) DBSCAN
 - d) Principal Component Analysis (PCA)
7. What is the purpose of the "train-test split" in machine learning?
 - a) To optimize model performance
 - b) To evaluate the model on unseen data
 - c) To ensure the model runs faster
 - d) To balance the dataset
8. What is a confusion matrix used for?

- a) To display the training accuracy of the model b) To evaluate the performance of a classification algorithm c) To calculate the covariance between features d) To visualize the decision boundaries
9. Which Python library is commonly used for data manipulation and analysis?
a) TensorFlow b) NumPy c) Matplotlib d) Pandas
10. Least Square Method uses ____.
a) Linear polynomial b) Linear regression c) Linear sequence d) None of the mentioned above
11. If several elements are competing for the same bucket in the hash table, what is it called?
a) Diffusion b) Replication c) Collision d) Duplication
12. Which data structure is used to store the undo history in a web browser?
a) Stack b) Queue c) Linked List d) Hash table
13. State True or False i) Binary search is used for searching in a sorted array ii) The time complexity of binary search is $O(\log n)$
a) True, True b) False, True c) True, false d) False, False
14. What can be said about the array representation of a circular queue when it contains only one element?
a) $FRONT = REAR + 1$ b) $FRONT = REAR - 1$ c) $FRONT = REAR = NULL$ d) None of these
15. The Inorder and Preorder traversal of a binary tree is d b e a f c g and a b d e c f g respectively. Which among the following is the correct Post Order Traversal Sequence for this tree?
a) d e b f g c a b) e d b g f c a c) e d b f g c a d) d e f g b c a
16. Assume that the operators +, -, X are left associative and ^ is right associative. The order of precedence (from highest to lowest) is ^, X, +, -. The postfix expression for the infix expression $a + b X c - d ^ e ^ f$ is?
a) $abc X + def ^ -$ b) $abc X + de ^ f -$ c) $ab + c X d - e ^ f ^$ d) $) - + a X bc ^ ^ def$
17. The worst case complexity of quick sort is
a) $O(n)$ b) $O(\log n)$ c) $O(n^2)$ d) $O(n \log n)$
18. You are given pointers to first and last nodes of a singly linked list, which of the following operations are dependent on the length of the linked list?
a) Delete the first element b) Insert a new element as a first element c) Add a new element at the end of the list d) Delete the last element of the list
19. Which of the following can be the sequence of nodes examined in binary search tree while searching for key 88?
a) 90,40,65,50,88 b) 90,110,80,85,88 c) 190,60,90,85,88 d) 65,140,80,70,88
20. What is the advantage of a hash table as a data structure?

- a) easy to implement b) faster access of data c) exhibit good locality of reference d) very efficient for less number of entries

21 Which normal form is considered adequate for normal relationship database design?

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

22

X	Y	Z
1	4	2
1	5	3
1	6	3
3	2	2

Given the relation instance

Which of the following functional dependencies are satisfied by the instance?

- a) $XY \rightarrow Z$ and $Z \rightarrow Y$ b) $YZ \rightarrow X$ and $Y \rightarrow Z$ c) $YZ \rightarrow X$ and $X \rightarrow Z$ d) $XZ \rightarrow Y$ and $Y \rightarrow X$

23 What are the desirable properties of a decomposition?

- a) Partition constraint b) Dependency preservation c) Redundancy d) Security

24 Let E1 and E2 be two entities in an E/R diagram with simple single-valued attributes. R1 and R2 are two relationships between E1 and E2, where R1 is one-to-many and R2 is many-to-many. R1 and R2 do not have any attributes of their own. What is the minimum number of tables required to represent this situation in the relational model?

- a) 3 b) 4 c) 5 d) 6

25 Which one of the following statements is NOT correct about the B+ tree data structure used for creating an index of a relational database table?

- a) B+ Tree is a height-balanced tree b) Non-leaf nodes have pointers to data records c) Key values in each node are kept in sorted order d) Each leaf node has a pointer to the next leaf node

26 Which of the following is a DML command?

- a) DELETE b) CREATE c) ALTER d) DROP

27 Consider the relation R (A, B, C, D, E) and the functional dependency set $F = \{AB \rightarrow CD, ABC \rightarrow E, C \rightarrow A\}$. How many candidate keys are possible for the relation R?

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

28 Map the following statements to TRUE(T) or FALSE(F) respectively

(i) In SQL, by default 'order by' clause lists items in descending order.

(ii) In SQL, 'SELECT' clause automatically eliminates all duplicates.

- a) (i) TRUE and (ii) TRUE b) (i) TRUE and (ii) FALSE c) (i) FALSE and (ii) TRUE d) (i) FALSE and (ii) FALSE

29 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

- 30 In SQL, which of the following is an aggregate function?
 a) Avg b) Select c) Ordered by d) Distinct
- 31 Consider the reference string: 0 1 2 3 0 1 4 0 1 2 3 4 If FIFO page replacement algorithm is used, then the number of page faults with three page frames and four page frames are ____ and ____ respectively.
 a) 10, 9 b) 9, 9 c) 10, 10 d) 9, 10
- 32 Which of the following is NOT a primary function of an operating system?
 a) Memory management b) Device management c) File management d) Database management
- 33 If frame size is 4KB then a paging system with page table entry of 2 bytes can address ____ bytes of physical memory.
 a) 2^{12} b) 2^{16} c) 2^{18} d) 2^{28}
- 34 What is Response time?
 a) the total time taken from the submission time till the completion time b) the total time taken from the submission time till the first response is produced c) the total time taken from the submission time till the response is output d) none of the mentioned
- 35 The problem of indefinite blockage of low priority jobs in general priority scheduling algorithm can be solved using
 a) Swapping b) Dirty Bit c) Aging d) Compaction
- 36 Which of the following is true with regard to Round Robin scheduling technique?
 a) Responds poorly to short process with small time quantum b) Works like SJF for larger time quantum c) Does not use a prior knowledge of burst times of processes d) Ensure that the ready queue is always of the same size
- 37 Which memory management technique allows for efficient utilization of memory by allocating memory in variable-sized blocks?
 a) Paging b) Segmentation c) Swapping d) Fragmentation
- 38 A deadlock in an operating system occurs when:
 a) A process is unable to access a required resource indefinitely b) A process gets stuck in an infinite loop c) A process exceeds its allocated memory limit d) A process encounters an error during execution
- 39 Semaphore is a/an _____ to solve the critical section problem.
 a) hardware for a system b) special program for a system c) integer variable d) none of the mentioned
- 40 Consider the following set of processes with the arrival time and length of CPU burst time given in milli seconds(ms)
 Process Id Busrt Time Arrival Time

P1	0	5
P2	2	3
P3	2	2
P4	5	3
P5	6	1

What is the average turn around time for these processes with First Come First Serve (FCFS) scheduling algorithm?

- a) 5.3ms b) 6.4ms c) 7ms d) 8.2ms

41 Choose the Python data structure responsible for the storage and manipulation of tabular data in Data Science

- a) Array b) List c) Dictionary d) DataFrame

42 Which classification method is particularly known for its simplicity and effectiveness in text classification problems?

- a) Decision Trees b) Naive Bayes c) Rule-Based Classification d) K-Nearest Neighbors

43 What is the primary objective of a Support Vector Machine?

- a) To minimize the number of support vectors b) To maximize the margin between different classes c) To minimize the distance between data points and the decision boundary d) To maximize the number of data points within the margin

44 What does the Area Under the ROC Curve (AUC-ROC) represent in model evaluation?

- a) The model's accuracy b) The trade-off between Precision and Recall c) The model's ability to distinguish between classes d) The proportion of true negatives correctly identified

45 In the context of linear regression, what is the primary goal of the gradient descent algorithm?

- a) To maximize the cost function b) To minimize the cost function c) To find the maximum likelihood estimate d) To compute the eigenvalues of the feature matrix

46 In unsupervised learning, the primary goal is to:

- a) Predict outcomes based on input data. b) Identify hidden structures or patterns in data c) Maximize cumulative rewards through interactions d) Use a small amount of labeled data with a large amount of unlabeled data

47 Which of the following is not a type of neural network?

- a) Feedforward neural network b) Convolutional neural network c) Recurrent neural network d) Decision tree neural network

48 What type of data is considered unstructured?

- a) Data in relational databases b) Data in spreadsheets c) Data in CSV files d) Text documents and images

- 49 What is the purpose of regression analysis?
- a) Describing Variability b) Predicting the relationship between variables c) Correlation Analysis d) Data Mining
- 50 What do you understand by K in the k-Mean algorithm?
- a) i. Number of iterations b) Number of attributes c) Number of clusters d) Number of data
