Code No: MC2021/R20

MCA II Semester Regular Examinations, October-2021
DATABASE MANAGEMENT SYTEMS

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a What are the responsibilities of the DBA and the database designers?   7M
   b Discuss the main categories of data models. What are the basic differences between   7M
      the Relational model, the object model.

OR

2. a What are the four main types of actions involved in databases? Briefly discuss   7M
      each.
   b What is logical data independence and why is it important?   7M

UNIT-II

3. a Draw an ER diagram for Hospital management system   7M
   b What is a view? How views are implemented?   7M

OR

4. a Explain the importance of Null values in Relational Model.   7M
   b Create database and views for employee with minimum 4 attributes. And also   7M
      perform altering and destroying tables and view.

UNIT-III

5. Consider the SAILOR DATABASE   14M
    Sailors (sid:string, sname:string, rating:integer, age:real)
    Boats (bid:integer, bname:string, color:string)
    Reserves (sid:integer, bid:integer, day:date)
    Based on the above schemas answer the following queries. Based on the above
    schema, write the corresponding Relational Algebra, SQL queries for the following?
    i)   Find the names of sailors who have reserved at least one boat.
    ii) Find the names of the sailors who have reserved both a Red boat and a Green
         boat.
    iii) Find names of sailors who have reserved all boats.
    iv) Find all sailors with a rating above 7.

OR

6. a What is grouping? Is there a counterpart in relational algebra? Explainthis feature,   7M
      and discuss the interaction of the HAVING and WHERE clauses.Mention any
      restrictions that must be satisfied by the fields that appear inthe GROUP BY clause.
      Give examples.
   b Write a short note on: 7M
         i) Constraints versus Triggers
         ii) Null Values

UNIT-IV

7. a Consider the following set F of functional dependencies on the relationschema r (A, B, C, D, E, F):   7M

   A→BCD
   BC→DE
   B→D
   D→A

   i) Compute B$^+$.
   ii) Compute a canonical cover for the above set of functional dependenciesF; give each step of your derivation with an explanation.

   b What is multi valued dependency? Illustrate 4NF with an example.   7M

OR

8. a Explain the phantom phenomenon. Why may this phenomenon lead to an incorrect concurrent execution despite the use of the two-phase locking protocol?   7M

   b   7M

UNIT-V

9. a What is a cascadeless schedule? Why is cascadelessness of schedules desirable? Are there any circumstances under which it would be desirable to allow non-cascadeless schedules? Explain your answer.   7M·

   b Why concurrency control is needed? Explain the problems that would arise when concurrency control is not provided by the database system.   7M

OR

10. a Consider the precedence graph of following Figure. Is the corresponding schedule conflict serializable? Explain your answer.   7M
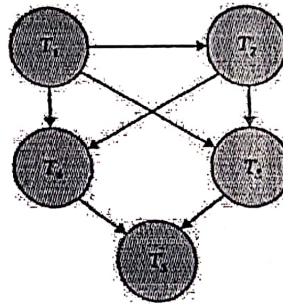
   b Discuss two Phase Locking protocol to ensure serializability.   7M

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Code No: MC2022/R20

MCA II Semester Regular Examinations, October-2021
COMPUTER NETWORKS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1.	a	Explain OSI reference architecture in detail.	7M
	b	Why are a LAN required and what objectives are achieved by having a LAN?	7M

OR

2.	a	Differentiate between guided and unguided transmission media.	7M
	b	Why twisted pair cables are preferable over coaxial cables? Explain.	7M

UNIT-II

3.	a	Explain in detail about the synchronous time division multiplexing.	7M
	b	What are the various types of error detection methods?	7M

OR

4.	a	Calculate the polynomial checksum for the following frame and generator Frame: 110101101 1and Generator: x^4+x+1	7M
	b	Explain Sliding window protocols in detail.	7M

UNIT-III

5.	a	Describe the working principle of Carrier sense multiple access with collision Detection (CSMA/CD).	7M
	b	Distinguish between pure ALOHA and slotted ALOHA.	7M

OR

6.	a	What are the common Ethernet Implementations? Explain them.	7M
	b	Explain different controlled access protocols in detail.	7M

UNIT-IV

7.	a	With an example, explain the distance vector routing.	7M
	b	Explain the prevention polices of congestion.	7M

OR

8.	a	In what way a selecting flooding differs from flooding. Explain.	7M
	b	How is the Connection - Oriented Services implemented? Explain.	7M

UNIT-V

9.	a	What are the functions of transport layer? State transport service primitives.	7M
	b	Describe importance of DNS in application layer.	7M

OR

10.	a	Give the format of the UDP segment and TCP segment? Explain when UDP ispreferred to TCP.	7M
	b	Define FTP. Discuss in brief about FTP.	7M

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Code No: MC2023/R20

MCA II Semester Regular Examinations, October-2021

SOFTWARE ENGINEERING AND DESIGN PATTERNS

Time: 3 Hours

Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a What is Software Process? How is it related to a Software Project and Product? 7M
    b What is waterfall model? How is it different from other engineering process models? 8M

OR

2. a Discuss Prototyping Model with advantages and disadvantages. 8M
    b What is agility? List and explain the agility principles to achieve agility. 7M

UNIT-II

3. a To develop use cases, what are the questions to be answered? What is the template for detailed description of use case? 7M
    b How to plan for monitoring a project using measurements to check if a project is progressing as per the plan? 8M

OR

4. Explain in detail about COCOMO model with an example. 15M

UNIT-III

5. a Suggest how you will evaluate a proposed architecture from a modifiability perspective 8M
    b Explain the testing objectives and its principles. 7M

OR

6. a Define verification and validation. What are the differences between them? Explain. 7M
    b What are different types of architectural styles exist for software and explain any one software architecture. 8M

UNIT-IV

7. a Explain in detail about Singleton design pattern. 7M
    b Explain in detail about Look-and-Feel Standards in document editors. 8M

OR

8. a Discuss in detail about factory method of design pattern. 7M
    b Discuss about how to make user interface more attractive in document editors. 8M

UNIT-V

9. a Define structural patterns. Explain in detail the adapter pattern. 7M
    b Explain the structure of mediator design pattern with a class diagram and discuss the collaboration with a sequence diagram. 8M

OR

10. a Briefly discuss façade pattern with respect to design and implementation. 8M
    b Explain the implementation issues of observer design pattern 7M

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Code No: MC2024/R20

MCA II Semester Regular Examinations, October-2021
DATA WAREHOUSING AND MINING

Time: 3 Hours

Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a What are summery statistics? Explain with suitable examples. 6M
   b Define sampling. What are different types of sampling? 6M

OR

2. a What is an attribute? What are the different types of attributes? 6M
   b Discuss briefly various measures of similarity and dissimilarity between attributes and data objects. 6M

UNIT-II

3. a Consider the data set shown in below Table 6M

Record	A	B	C	Class
1	0	0	0	+
2	0	0	1	−
3	0	1	1	−
4	0	1	1	−
5	0	0	1	+
6	1	0	1	+
7	1	0	1	−
8	1	0	1	−
9	1	1	1	+
10	1	0	1	+

   i) Estimate the conditional probabilities for $P(A|+)$, $P(B|+)$, $P(C|+)$, $P(A|−)$, $P(B|−)$, and $P(C|−)$.

   ii) Use the estimate of conditional probabilities given in the previous questionto predict the class label for a test sample $(A = 0, B = 1, C = 0)$ using the Naïve Bayes approach.

   iii) Estimate the conditional probabilities using the m-estimate approach, with $p = 1/2$ and $m = 4$.

   b Explain about evaluating the performance of a classifier. 6M

OR

4. a How to build a decision tree? Explain. 6M
   b What is SVM? Discuss how it handles non-separable case? 6M

1 of 2
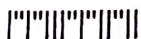
UNIT-III

5. a   A database has four transactions. Let min_sup=60% and min_conf=80%.   **7M**

       TID   Date   items_bought

      T100 10/15/99   {K,A,D,B}
      T200 10/15/99   {D,A,C,E,B}
      T300 10/19/99   {C,A,B,E}
      T400 10/22/99   {B,A,D}

      Find all frequent item sets using Apriori algorithm.

   b   How to handle continuous attributes? Discuss with example.   **5M**

OR

6. a   Find the frequent pattern using FP-Growth algorithm.   **7M**

      T1D   Items

      T1   {HotDogs, Buns, Ketchup}
      T2   {HotDogs, Buns}
      T3   {HotDogs, Coke, Chips}
      T4   {Chips, Coke}
      T5   {Chips, Ketchup}
      T6   {HotDogs, Coke, Chips}

   b   Discuss brieflycompact representation of frequent item sets.   **5M**

UNIT-IV

7. a   Write the DBSCAN algorithm and explain.   **6M**
   b   Difference between Bisecting K-means and K-means.   **6M**

OR

8. a   Apply single linkage and complete linkage clustering algorithms for the following 8   **8M**
     points to form 3 clusters:
       (4,6) , (2,5) , (9,3) , (6,9) , (7,5) , (5,7) , (2,2) , (6,6)

   b   What are different types of clusters? Explain.   **4M**

UNIT-V

9. a   Explain about web Structure Mining.   **6M**
   b   What is Search Engine? Describe its architecture.   **6M**

OR

10. a   Discuss briefly Kleinberg's HITS algorithm?   **6M**
   b   Write a short note on the following: **6M**
      i)   Enterprise search
      ii)   Characteristics of Search engines

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Code No: MC2025B/R20

MCA II Semester Regular Examinations, October-2021
DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a   How to improve the performance of union and find algorithms through weighted   7M
        union and collapsing find? Explain algorithms.
    b   Can we solve a problem with non-polynomial time complexity? Discuss various   7M
        methods for it.

OR

2. a   Compare time complexity with space complexity?   7M
    b   Write the pseudo code for expressing algorithms.   7M

UNIT-II

3. a   Strassen's matrix multiplication reduces the time complexity of conventional matrix 7M
        multiplication. How? Show with derivation for time complexity.
    b   Trace merge sort algorithm for the given array of numbers, also show the tree calls 7M
        and compute the average time complexity.31, 19, 23, 25, 57, 48, 37, 12,92, 25,
        86,33

OR

4. a   Write and explain recursive binary search algorithm.   7M
    b   Derive the time complexity of merge sort.   7M

UNIT-III

5. a   What is principle of optimality? How it is used in dynamic programming to solve   7M
        optimization problems.
    b   Generate the optimal solution for 0/1 Knapsack problem when n=4, m=25   7M
        (w1,w2,w3,w4)=(8,10,5,7) and (p1,p2,p3,p4)=(2,5,8,1)

OR

6. a   What is the need of the Reliability design? Give the equations for the Reliability   7M
        design of the system
    b   Dynamic programming was best compared to the greedy method. Justify the statement.   7M

UNIT-IV

7. a   What is the backtracking? Give the solution for the 8 queens problem.   7M
    b   Write an algorithm for the graph coloring   7M

OR

8. a   What is sum-of-subsets problem? Write a recursive backtracking   7M
        algorithm for sum of subsets problem.
    b   What is a Hamiltonian Cycle? Explain how to find Hamiltonian path and cycle using   7M
        backtracking algorithm?

UNIT-V

9. a   Discuss about the cook's theorem.   7M
    b   Differentiate between NP-complete and NP-Hard   7M

OR

10. a   Explain FIFO Branch and Bound solution.   7M
    b   Illustrate 0/1 Knapsack problem with respect to branch and bound method.   7M

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Code No: MC2021/R20

MCA II Semester Regular/Supplementary Examinations, September-2022

DATABASE MANAGEMENT SYTEMS

Max. Marks: 70

Time: 3 Hours

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1.	a)	What is meant DBMS? Mention the advantages of DBMS.	7M
	b)	Explain architecture of DBMS with diagram.	7M

(OR)

2.	a)	Discuss the DBMS applications in detail.	7M
	b)	What is meant by data independence? Where it is used in DBMS?	7M

UNIT-II

3.	a)	Differentiate between relationship sets and entity sets.	7M
	b)	Discuss the additional features of the ER Model.	7M

(OR)

4.	a)	What is meant by enforcing integrity constraints? Mention some integrity constraints.	7M
	b)	What are views? Explain purpose and syntax of views.	7M

UNIT-III

5.	a)	What are selection and projections in relational algebra? How they are used in writing a SQL Query.	7M
	b)	What is meant by Renaming? Write an example of renaming algebra query.	7M

(OR)

6.	a)	What are active databases? Explain the design of active databases.	7M
	b)	What is meant by EXCEPT? How they are used in nested queries.	7M

UNIT-IV

7.	a)	Explain the merits of normalization.	7M
	b)	What is meant by Relation schema? Explain the purpose of function.	7M

(OR)

8.	a)	What is Boyce-codd normalization? How it is different from third normal form.	7M
	b)	Differentiate between functional dependencies and join dependencies.	7M

UNIT-V

9.	a)	Explain the mechanism of concurrency control.	7M
	b)	Discuss about lock-based protocols.	7M

(OR)

10.	a)	Distinguish between concurrency control and transaction management.	7M
	b)	Explain storage structure in transaction model.	7M

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1 of 1

Code No: MC2022/R20

MCA II Semester Regular/Supplementary Examinations, September-2022

COMPUTER NETWORKS

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a) Discuss the major functions performed by the Presentation layer and Application layer of the ISO -OSI model.   7M
   b) With neat examples explain analog signals & digital signals and periodic signals and aperiodic signals.   7M

(OR)

2. a) Explain the TCP/IP reference model of computer network with a neat diagram.   7M
   b) What is the significance of Twisted-pair cable? What are the different categories of UTP? Compare.   7M

UNIT-II

3. a) Explain how hamming code can be used to correct burst errors.   7M
   b) Discuss sliding window protocol using Go back n.   7M

(OR)

4. a) What kinds of errors can Vertical Redundancy check determine? What kinds of errors it cannot determine?   7M
   b) How does a Token Ring LAN operate? Discuss.   7M

UNIT-III

5. a) What is pure ALOHA and slotted ALOHA? Consider the delay of both at low load, Which one is less? Explain your answer.   7M
   b) Discuss the MAC layer functions of IEEE 802.11.   7M

(OR)

6. a) Explain the frame format, operation and ring maintenance feature of IEEE 802.5 MAC protocol.   7M
   b) Briefly define key requirements for wireless LANs.   7M

UNIT-IV

7. a) What are the network layer design issues? Explain.   7M
   b) Discuss about Congestion prevention polices.   7M

(OR)

8. a) What is Tunneling? Explain in detail.   7M
   b) Mention the limitations of Distance vector and Link state routing algorithm.   7M

UNIT-V

9. a) What are the properties of HTTP? What are the four groups of HTTP header? Explain.   7M
   b) Explain the architecture and services of e-mailing system.   7M

(OR)

10. a) Explain the TCP header and working of the TCP protocol.   7M
    b) Discuss how simple mail transfer protocol (SMTP) works? Can multimedia messages be transmitted using SMTP? Discuss.   7M

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Code No: MC2024/R20

MCA II Semester Regular/Supplementary Examinations, September-2022

DATA WAREHOUSING AND MINING

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a) i. What is data mining? Explain how the evolution of database technology led to data mining?   8M

    ii. Describe the functionalities of data mining.

   b) How is a data warehouse different from a database? How they are similar?   6M

(OR)

2. a) Describe the steps involved in data mining when viewed as a process of knowledge discovery.   7M

   b) Give any three commonly used statistical measures for the characterization of data dispersion, and discuss how they can be computed efficiently in large databases.   7M

UNIT-II

3. a) Why naive Bayesian classification is called "naive"? Briefly outline the major ideas of naive Bayesian classification.   7M

   b) Consider the following data set for a binary class problem and Calculate the information gain when splitting on A and B. Which attribute would the decision tree induction algorithm choose?   7M

A	B	Class Label
T	F	+
T	T	+
T	T	+
T	F	−
T	T	+
F	F	−
F	F	−
F	F	−
T	T	−
T	F	−

(OR)

4. a) What is boosting? State why it may improve the accuracy of decision tree induction.   7M

   b) Write an algorithm for k-nearest neighbor classification given k, the nearest number of neighbors, and n, the number of attributes describing each tuple.   7M

1 of 2

UNIT-III

5. a) Describe the different classifications of Association rule mining. **7M**

   b) How to generate association rules from frequent item sets? Discuss with suitable example. **7M**

(OR)

6. A database has 5 transactions. Let min sup = 60% and min conf = 80%. Find all frequent item sets using Apriori and FP-growth, respectively. Compare the efficiency of the two mining processes. **14M**

TID	items_bought
T100	{M, O, N, K, E, Y}
T200	{D, O, N, K, E, Y }
T300	{M, A, K, E}
T400	{M, U, C, K, Y}
T500	{C, O, O, K, I ,E}

UNIT-IV

7. a) Consider the mean of a cluster of objects from a binary transaction data set. Compute the following: **7M**

   i. What are the minimum and maximum values of the components of the mean?

   ii. What is the interpretation of components of the cluster mean?

   iii. Which components most accurately characterize the objects in the cluster?

   b) Discuss the similarity measures and distance measures frequently used in clustering the data. **7M**

(OR)

8. a) What is the main objective of clustering? Give the categorization of clustering approaches. Briefly discuss them. **6M**

   b) i. How to evaluate clustering algorithms? **8M**

   ii. Differentiate Agglomerative and Divisive Hierarchical Clustering?

UNIT-V

9. a) i. Explain the process of mining the World Wide Web. **7M**

   ii. What are the key issues in web mining?

   b) What are the 3 major tasks of web mining? Discuss **7M**

(OR)

10. a) What is the purpose of web mining? What techniques are used in web mining? Discuss. **7M**

    b) Discuss about HITS algorithm. **7M**

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2 of 2

Code No: MC2025B/R20

MCA II Semester Regular/Supplementary Examinations, September-2022
DESIGN AND ANALYSIS OF ALGORITHMS
Time: 3 Hours
Max. Marks: 70

Answer any FIVE Questions One Question From Each Unit
All Questions Carry Equal Marks

UNIT-I

1. a) Define and explain the asymptotic notations with an example for each.   7 M
   b) Develop the algorithm for FIND using collapsing rule with an example.   7 M

(OR)

2. a) List and explain different pseudo code conventions, with examples.   7 M
   b) Write the recursive algorithm for computing factorial of an integer and solve its recurrence relation for time complexity.   7 M

UNIT-II

3. a) Present and explain about randomized quick sort algorithm.   7 M
   b) Differentiate between Prim's and Kruskal's algorithms for finding the minimum cost spanning tree.   7 M

(OR)

4. a) Draw the tree of calls of merge sort for the following set: 7 M
   35, 25, 15, 10, 45, 75, 85, 65, 55, 5, 20, 18
   b) Compare the performance of Quick sort algorithm with merge sort algorithm.   7 M

UNIT-III

5. a) With an example, describe how traveling salesman problem can be solved using Dynamic Programming.   7 M
   b) Show that reliability design problem finds the best solution with multiple stages for the instance: $n=3$, $(c_1, c_2, c_3) = (40,15,25)$, and $C=120$, $(r_1, r_2, r_3) = (0.9, 0.8, 0.7)$.   7 M

(OR)

6. a) Solve the following 0/1 Knapsack problem using dynamic programming: 7 M
   $n=4$, $m=8$, $(p_1, p_2, \ldots, p_4) = (1,2,5,6)$, $(w_1, w_2, \ldots, w_4) = (2,3,4,5)$
   b) Illustrate the working principle of dynamic programming with all pairs shortest path problem.   7 M

UNIT-IV

7. a) Explain the 4-Queen problem using backtracking. Draw the state space tree by taking implicit constraints, explicit constraints and bounding function.   7 M
   b) Draw the state space tree for m-coloring of a graph when $n=3$ and $m=3$.   7 M

(OR)

8. a) Present and explain the control abstraction for backtracking.   7 M
   b) Describe the sum of subsets problem and explain the algorithm to find the solution for $W=\{8,12,14,11\}$ and $m=31$.   7 M

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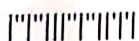
UNIT-V

9. a) Differentiate between FIFO and LC branch and bound techniques.   7 M
    b) What are non-deterministic algorithms? Explain with examples.   7 M

(OR)

10. a) With an example, explain how the branch – and – bound technique is used to solve   7 M
       0/1 knapsack problem.
    b) How are P and NP problems related? Give the relation between NP-hard and NP   7 M
       problems.

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Course Code: 203MC2T06

ADITYA ENGINEERING COLLEGE (A)

MCA – II Semester End Examinations Regular & Supplementary (AR20) – SEP 2022

DATABASE MANAGEMENT SYSTEMS

Time: 3 hours

Max. Marks: 70

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1 a Who is a DBA? What is his role. How does his role differ from a database designer? — K2 CO1 [8M]

  b Define redundancy. Discuss about controlling redundancy. — K6 CO1 [6M]

OR

2 a Explain three schema architecture — K2 CO1 [7M]

  b Discuss the types of languages provided by DBMS. — K6 CO1 [7M]

UNIT – II

3 a Draw the ER diagram of Hospital Management System application. — K1 CO2 [7M]

  b Define weak entity set. How is it represented explain with an example — K1 CO2 [7M]

OR

4 a Define integrity constraint. Write about foreign key — K1 CO3 [7M]

  b Write about relational database query — K1 CO3 [7M]

UNIT – III

5 a Write about selection and projection operators — K1 CO3 [7M]

  b Discuss about various set operations — K6 CO3 [7M]

OR

6 a Write about the aggregate operators in SQL — K1 CO3 [7M]

  b Define a trigger. Compare row level and state level triggers — K5 CO3 [7M]

UNIT – IV

7 a Discuss about problems that are caused by redundancy — K6 CO4 [7M]

  b What is normalization? Explain about the first three normal forms. — K2 CO4 [7M]

OR

8 a Discuss closure set of functional dependencies — K6 CO4 [7M]

  b Explain about join dependency where is it used in the fifth normal form — K2 CO4 [7M]

UNIT – V

9 a Define a Transaction. Explain Simple Transaction Model — K3 CO5 [7M]

  b Explain Serializability with an example — K3 CO5 [7M]

OR

10 a Discuss the performance of Locking — K3 CO6 [7M]

  b Write about Concurrency control in DBMS — K3 CO6 [7M]

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ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular & Supplementary (AR20) – SEP 2022

COMPUTER NETWORKS

Time: 3 hours   **Max. Marks: 70**

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1	a	Explain the functions of various layers in ISO-OSI reference model.	K2	CO1	[7M]
	b	Explain different types of Unguided Transmission media.	K2	CO1	[7M]
		OR			
2	a	Explain the different topologies of the network.	K2	CO1	[7M]
	b	Write about Transmission Impairments.	K2	CO1	[7M]

UNIT – II

3	a	Demonstrate the Error Correcting codes with an example.	K3	CO2	[7M]
	b	Explain in detail about the sliding window protocol using Go-Back- N.	K2	CO2	[7M]
		OR			
4	a	What is the need of Flow control? Explain the common approaches for flow control in data link layer.	K1	CO2	[7M]
	b	Explain in detail about the sliding window protocol using Selective Repeat.	K2	CO2	[7M]

UNIT – III

5	a	Explain the working of Multiple Access Protocols.	K2	CO3	[7M]
	b	What are the several classifications of Ethernet?	K1	CO3	[7M]
		OR			
6	a	Explain the process of CSMA with Collision Detection.	K2	CO3	[7M]
	b	Explain the fields in the 802.11 Frame Structure.	K2	CO3	[7M]

UNIT – IV

7	a	With an example explain the shortest-path routing algorithm used in computer networks.	K3	CO4	[7M]
	b	What are the general principles of congestion control? Explain.	K2	CO4	[7M]
		OR			
8	a	Explain the Link State Routing Algorithm with an example.	K3	CO4	[7M]
	b	Explain about IPV6.	K2	CO4	[7M]

UNIT – V

9	a	Discuss in detail about the connection establishment and release in TCP.	K2	CO5	[7M]
	b	How DNS service maps domain names to IP addresses.	K2	CO5	[7M]
		OR			
10	a	Compare and Contrast the UDP header and the TCP header.	K2	CO5	[7M]
	b	Write short notes on HTTP.	K1	CO5	[7M]

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ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular & Supplementary (AR20) – SEP 2022

SOFTWARE ENGINEERING AND DESIGN PATTERNS

Time: 3 hours   Max. Marks: 70

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1	a	Discuss about evolving role of software.	K6	CO1	[7M]
	b	What is a myth. Discuss different management myths	K1	CO1	[7M]

OR

2	a	Explain water fall model.	K1	CO1	[7M]
	b	Define agility. Elaborate about agile process model.	K6	CO1	[7M]

UNIT – II

3	a	What is an SRS. Explain the features of an SRS.	K2	CO2	[7M]
	b	Explain requirements specification features.	K2	CO2	[7M]

OR

4	a	Explain about a use case. Write about primary and secondary actor and their goals.	K2	CO2	[7M]
	b	Discuss about scheduling principles.	K6	CO2	[7M]

UNIT – III

5	a	Define software architecture. Why is it important.	K1	CO3	[7M]
	b	Explain about object oriented design view	K2	CO3	[7M]

OR

6	a	What is a design? Explain about design principles.	K1	CO3	[7M]
	b	Explain about basic path testing method	K2	CO3	[7M]

UNIT – IV

7	a	What is a design pattern. Discuss about its essential elements.	K1	CO4	[7M]
	b	How does design pattern solve day to day problems.	K1	CO4	[7M]

OR

8	a	Describe all steps for applying a design patterns.	K2	CO5	[7M]
	b	Discuss about prototype pattern	K6	CO7	[7M]

UNIT – V

9	a	Write about a façade pattern.	K1	CO7	[7M]
	b	Discuss about proxy pattern.	K6	CO7	[7M]

OR

10	a	Discuss motivation and applicability in interpreter pattern	K6	CO8	[7M]
	b	Write about chain of responsibility pattern	K1	CO8	[7M]

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ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular & Supplementary (AR20) – SEP 2022

DATA WAREHOUSING AND MINING

Time: 3 hours

Max. Marks: 70

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I
1	a	What is Data Mining? Explain the challenges of Data Mining.	K2	CO1	[7M]
	b	Explain the different types of Data in data mining.	K2	CO1	[7M]

OR

2	a	What is Sampling? Explain how Discretization and Binarization are used in Data Preprocessing?	K2	CO1	[7M]
	b	What is Visualization? Explain the general concepts and techniques for data Visualization.	K2	CO1	[7M]

UNIT – II
3	a	Explain Decision Tree Induction algorithm with a suitable example.	K2	CO3	[7M]
	b	What is Overfitting problem? Explain the methods to solve the overfitting problem.	K2	CO3	[7M]

OR

4	a	Explain how a rule-Based Classifier works along with its characteristics.	K2	CO3	[7M]
	b	Write about Nearest Neighbor Classifier Technique.	K3	CO3	[7M]

UNIT – III
5	a	Explain the procedure to mining Frequent Itemsets using Candidate generation?	K2	CO4	[7M]
	b	Write about FP Growth Algorithm in detail.	K3	CO4	[7M]

OR

6	a	Write about Sequential patterns with Timing Constraints in detail.	K3	CO4	[7M]
	b	Explain Apriori-Like method for subgraph patterns with support count.	K2	CO4	[7M]

UNIT – IV
7	a	Explain the strengths and weaknesses of K-Means Algorithm.	K2	CO5	[7M]
	b	Describe Agglomerative Hierarchical Clustering in detail.	K3	CO5	[7M]

OR

8	a	Differentiate between-means and DBSCAN in cluster Analysis.	K3	CO5	[7M]
	b	Explain cluster Evaluation methods ?	K2	CO5	[7M]

UNIT – V
9	a	What is Web content mining? Explain briefly with example?	K2	CO6	[7M]
	b	Write about Web structure mining.	K3	CO6	[7M]

OR

10	a	What is Page ranking? Explain page ranking Algorithm?	K2	CO6	[7M]
	b	Explain various components of Search engine Architecture?	K2	CO6	[7M]

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ADITYA ENGINEERING COLLEGE (A)

MCA – II Semester End Examinations Regular & Supplementary (AR20) – SEP 2022

DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 hours   Max. Marks: 70

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1 a Write short note on Fundamental design steps of Algorithmic Problem Solving K3 CO1 [7M]

   b Explain about asymptotic notations and classify the basic asymptotic efficiency classes? K3 CO1 [7M]

OR

2 a Describe briefly the Time Complexity estimation, space complexity estimation and tradeoff between Time and Space complexity. K3 CO2 [8M]

   b Describe an algorithm for binary search and analyze the algorithm for its time complexity. K3 CO2 [6M]

UNIT – II

3 a Classify the control abstraction for Divide and Conquer technique with Example K3 CO3 [7M]

   b Explain Strassen's Algorithm steps with Time Complexity K3 CO3 [7M]

OR

4 a Explain the Quick sort algorithm and write their time complexities with example list are 5, 3, 1, 9, 8, 2, 4, and 7. K3 CO3 [7M]

   b Distinguish between Dynamic Programming Method and Greedy Method K3 CO3 [7M]

UNIT – III

5 a How to compute 0/1 Knapsack problem using dynamic programming and explain it. K3 CO4 [7M]

   b Explain about Reliability design in dynamic programming. K3 CO4 [7M]

OR

6 a Explain Memory Function algorithm for the Knapsack problem K3 CO4 [7M]

   b Explain Optimal Binary Search Tree (OBST) with example. K3 CO4 [7M]

UNIT – IV

7 a Explain the backtracking algorithm for the n-queens problem.✓ K3 CO5 [7M]

   b Apply backtracking technique to solve the following instance of subset sum problem: S={1,3,4,5} and d=11.✓ K3 CO5 [7M]

(P.T.O)

H.T.No: 2 0 A 9 1 F 0 0 2 3   Course Code: 203MC2E02

ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular (AR20) – OCT 2021

DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3 hours   Max. Marks: 70

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1 a Describe briefly the Time Complexity estimation, space complexity estimation and tradeoff between Time and Space complexity   K1 CO1 [7M]

   b Explain the Performance analysis of an algorithm with an example   K1 CO1 [7M]

OR

2 a What is weighting rule? Discuss about the union algorithm using weighting rule.   K2 CO2 [8M]

   b What is meant by disjoint set? Explain the applications of disjoint set.   K1 CO2 [6M]

UNIT – II

3 a What is dividing and conquer strategy and explain the binary search with suitable example problem   K1 CO3 [7M]

   b Explain Strassen's Matrix multiplication Steps with time complexity   K1 CO3 [7M]

OR

4 a Distinguish between Quick sort and Merge sort, Arrange the following numbers in increasing order using Merge sort. (18, 29, 68, 32, 43, 37, 87, 24, 47, 50)   K3 CO3 [8M]

   b Distinguishes between Dynamic Programming Method and Greedy Method   K2 CO4 [6M]

UNIT – III

5 a Write all pairs shortest paths algorithm and explain the steps with an example.   K2 CO5 [8M]

   b Give the pseudo code for Prim's algorithm and apply it to find the minimum spanning tree with suitable example   K3 CO5 [6M]

OR

6 a What is principle's of optimality? Explain how travelling sales person problem uses the dynamic programming technique with example.   K1 CO4 [7M]

   b Explain how Matrix –chain Multiplication problem can be solved using dynamic programming with suitable example.   K2 CO3 [7M]

(P.T.O)

UNIT – IV

7 a Explain the backtracking algorithm for the 8-queens problem.   K3 CO6 [7M]

   b Give solution to Hamiltonian circuit using Backtracking technique   K3 CO6 [7M]

OR

8 a Give the statement of sum –of subsets problem. Find all sum of subsets for K3 CO6 [7M]
n=4, (w1, w2, w3, w4) = (11, 13, 24, 7) and M=31.

   b Apply backtracking technique to solve the following instance of sum of K3 CO6 [7M]
subsets problem: S= {1, 3, 4, 5} and d=11.

UNIT – V

9 a Discuss Branch and Bound to compare Backtracking technique   K2 CO7 [6M]

   b Solve the following instance of the Knapsack problem by branch and K2 CO7 [8M]
bound algorithm. Knapsack capacity W=10

ITEM	WEIGHT	VALUE
1	4	$40
2	7	$42
3	5	$25
4	3	$12

OR

10 a Solve the following 6 city travelling salesperson problem using Branch and K3 CO7 [8M]
Bound algorithm

   b Compare Deterministic and Non-Deterministic algorithms   K2 CO7 [6M]

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ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular (AR20) – OCT 2021

DATABASE MANAGEMENT SYSTEMS

Time: 3 hours   Max. Marks: 70

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1	a	Define an end user. Discuss their categorization and activities	K1	CO1	[7M]
	b	Explain database system environment with a neat diagram	K2	CO1	[7M]

OR

2	a	Define data independence, differentiate between logical and physical data independence	K3	CO1	[7M]
	b	What is an interface? Write about any 3 interfaces in detail.	K1	CO1	[7M]

UNIT – II

3	a	Compare UML with ER diagrams.	K2	CO2	[7M]
	b	Discuss conceptual and logical database designs.	K1	CO2	[7M]

OR

4	a	Define and explain about candidate key, super key and primary key	K1	CO2	[7M]
	b	What is a view? How are views used for security	K1	CO2	[7M]

UNIT – III

5	a	Define a join. Explain different types of joins with examples.	K2	CO3	[7M]
	b	What is a division operator? Where is it used? Explain query of division operator with an example.	K2	CO3	[7M]

OR

6	a	What is a nested query? Explain correlated nested queries.	K2	CO3	[7M]
	b	What is a group by clause? Where is it used? Explain with an example.	K1	CO3	[7M]

UNIT – IV

7	a	What are functional dependencies? Discuss about their relation with primary key.	K1	CO4	[7M]
	b	Discuss how BCNF is superior to 3NF	K1	CO4	[7M]

OR

8	a	Define multivalued dependencies. Where is it applied in normalization	K1	CO4	[7M]
	b	Explain fourth normal form with an example	K2	CO4	[7M]

UNIT – V

9	a	What are ACID properties? Explain them with examples	K1	CO5	[7M]
	b	Define a Locking protocol. Explain Strict two-Phase Locking protocol	K1	CO5	[7M]

OR

10	a	Discuss How does a DBA handle Trashing	K1	CO5	[7M]
	b	Explain Validation Based Protocols	K2	CO5	[7M]

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ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular (AR20) – OCT 2021

COMPUTER NETWORKS

Time: 3 hours   Max. Marks: 70

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1	a	Explain any 4 layers of *OSI* reference model with a neat diagram.	K2	CO1	[7M]
	b	Briefly explain about Guided Transmission Media.	K2	CO1	[7M]

OR

2	a	Compare and contrast between the *OSI* model and *TCP/IP* model.	K2	CO2	[7M]
	b	Write about Transmission Impairments.	K2	CO1	[7M]

UNIT – II

3	a	Discuss in brief about the Error Detection Codes.	K3	CO2	[7M]
	b	Describe the stop and wait protocol with neat sketch.	K2	CO2	[7M]

OR

4	a	Give brief information about *CRC* with an example.	K3	CO2	[7M]
	b	Elaborate Sliding Window Protocol with an example.	K3	CO2	[7M]

UNIT – III

5	a	Explain about Carrier Sense Multiple Access Protocols.	K2	CO5	[7M]
	b	Discuss in brief the MAC frame structure for 805.11 Frame Structure-Services.	K2	CO5	[7M]

OR

6	a	Explain in detail the operation of pure ALOHA and slotted ALOHA.	K2	CO5	[7M]
	b	Sketch the 802.11 Frame Structure with a neat diagram.	K2	CO5	[7M]

UNIT – IV

7	a	Show the working mechanism of Distance Vector Routing Algorithm with an example.	K2	CO6	[7M]
	b	Explain classification of the IP address.	K2	CO4	[7M]

OR

8	a	What is Load Shedding? Explain.	K2	CO6	[7M]
	b	Explain about IPV4.	K2	CO4	[7M]

UNIT – V

9	a	Summarize about Transmission Control Protocol services.	K2	CO6	[7M]
	b	What is the importance of DNS in Computer Networks? Explain.	K2	CO6	[7M]

OR

10	a	Explain about User Datagram Protocol services	K2	CO6	[7M]
	b	Write short notes on Electronic Mail.	K2	CO6	[7M]

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ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular (AR20) – OCT 2021

SOFTWARE ENGINEERING AND DESIGN PATTERNS

Time: 3 hours   **Max. Marks: 70**

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1	a	Explain different activities of process framework	K2	CO1	[7M]
	b	Discuss software development process in detail	K2	CO1	[7M]

OR

2	a	Discuss prototyping model with an example	K2	CO1	[7M]
	b	What is EXTREME programming. Discuss industrial practices of XP.	K2	CO1	[7M]

UNIT – II

3	a	What is a requirement? Discuss different types of requirements.	K2	CO2	[7M]
	b	Elaborate about different non functional requirements	K1	CO2	[7M]

OR

4	a	Define quality how is it assessed	K1	CO2	[7M]
	b	What is a software project plan. How is it monitored	K1	CO2	[7M]

UNIT – III

5	a	Define coupling. Explain different types of coupling	K2	CO3	[7M]
	b	What is a component? How is it different from a view?	K1	CO3	[7M]

OR

6	a	Explain object oriented design.	K2	CO3	[7M]
	b	Write the software testing characteristics	K1	CO3	[7M]

UNIT – IV

7	a	Discuss the format of a design pattern	K1	CO4	[7M]
	b	Write about design patterns in MVC	K1	CO4	[7M]

OR

8	a	Discuss applicability and structure of abstract factory method	K2	CO4	[7M]
	b	Identify participants and roles of factory method	K3	CO4	[7M]

UNIT – V

9	a	Explain about adapters in java	K2	CO5	[7M]
	b	Define façade pattern. How do you build a façade class	K1	CO5	[7M]

OR

10	a	Write about strategy pattern	K1	CO5	[7M]
	b	Discuss the consequences of visitor pattern	K1	CO5	[7M]

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Course Code: 203MC2T09

H.T.No: 2 0 A 9 1 F 0 0 2 3

ADITYA ENGINEERING COLLEGE (A)
MCA – II Semester End Examinations Regular (AR20) – OCT 2021

DATA WAREHOUSING AND MINING

Max. Marks: 70

Time: 3 hours

Answer ONE question from each unit
All Questions Carry Equal Marks (5 x 14 = 70M)
All parts of the questions must be answered at one place only

UNIT – I

1. a Explain the various preprocessing techniques used in data mining. — K2 CO1 [7M]
   b Explain the concept of similarity and dissimilarity in data mining. — K2 CO1 [7M]

OR

2. a Differentiate between OLAP and OLTP. — K3 CO2 [7M]
   b Explain Data cube computation Methods in data warehousing. — K2 CO2 [7M]

UNIT – II

3. a Explain Decision tree Induction with a suitable example. — K2 CO3 [7M]
   b Explain the various methods for evaluating the performance of a Classifier. — K2 CO3 [7M]

OR

4. a Write about Bayesian classifier for Bayesian belief Networks. — K2 CO3 [7M]
   b Explain the concept of Support vector machines in detail. — K2 CO3 [7M]

UNIT – III

5. a Explain Apriori Principle and write about frequent Item set Generation in Apriori Algorithm. — K2 CO4 [7M]
   b Explain FP growth Algorithm. — K2 CO4 [7M]

OR

6. a Explain different techniques for handling continuous Attributes. — K2 CO4 [7M]
   b Write about different subgraph patterns in data mining. — K2 CO4 [7M]

UNIT – IV

7. a What is Clustering? Write about K-means Algorithm. — K1 CO5 [7M]
   b Explain Lance-Williams formula for Cluster Proximity. — K2 CO5 [7M]

OR

8. a Describe the general characteristics of Clustering Algorithm. — K3 CO5 [7M]
   b Write about Scalable clustering Algorithm. — K2 CO5 [7M]

UNIT – V

9. a Define Web mining. Explain the characteristics of web mining. — K2 CO6 [7M]
   b What is Web content mining? Explain briefly with example? — K1 CO6 [7M]

OR

10. a What is Page ranking? Explain page ranking Algorithm? — K2 CO6 [7M]
    b Explain the architecture of a search engine. — K2 CO6 [7M]

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