C 21267 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Computer Science

BCS 4C 04—DATA STRUCTURE USING C PROGRAMMING

(2017—2018 Admissions)

Time : Three Hours Maximum : 64 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. ———— is an example for non-primitive data structure.
2. LIFO stands for ————.
3. Give the time complexity of selection sort algorithm.
4. ———— is the equivalent postfix expression corresponding to the infix expression : (A – B) * (D/E).
5. In linked list, each node contains a minimum of two fields. One field is data field to store the data and second field is to store ————.

   A) Address of the linked list. B) Pointer to character.

   C) Pointer to integer. D) Pointer to next node.

6. Linked List is considered as an example of ———— type of memory allocation.

   A) Static. B) Dynamic.

   C) Heap. D) Run-time.

7. Recursion can be implemented using ———— data structure.
8. ———— data structure is a hybrid data structure serving the purpose of both the stack and queue and insertion and deletion of elements can take place from both the ends according to the requirements of the user.
9. The complexity of Binary search algorithm is ————.

   A) O (n). B) O (log n).

   C) O (n^2). D) O (n log n).

Part B

Answer **all** *questions.*
Each question carries 2 *marks.*

10. What is the difference between primitive and non-primitive data structure ?
11. Give the representation of sparse matrix.
12. What is header linked list ?
13. What is Dequeue ?
14. Write down the algorithm for linear search.

(5 × 2 = 10 marks)

Part C

Answer any **five** *questions.*
Each question carries 5 *marks.*

15. Explain the different categories of data structures.
16. Compare and contrast arrays and singly linked list.
17. Write down the algorithm for adding a node at the end of linear linked list.
18. What are the different operations on stack ? Explain.
19. Explain any *two* applications of queue.
20. Write an algorithm for counting the number of nodes in a singly linked list.
21. What do you mean by priority queue ? How it can be represented in memory ? Explain the applications of priority queue ? Explain.
22. Apply merge sort to the list : 14, 17, 18, 12, 9, 7, 11, 34, 21, 11.

(5 × 5 = 25 marks)

Part D

Answer any **two** *questions.*
Each question carries 10 *marks.*

23. Illustrate the steps for evaluating the postfix expression ABC*D/+ where A = 2 B = 3 C = 4 D = 6 using stack.
24. What is circular linked list ? Write the algorithm for adding and deleting a node at the beginning of a circular linked list
25. Compare and contrast linear and binary search algorithm. Also compare the time and space complexities of the above algorithms.

(2 × 10 = 20 marks)

C 21266 (Pages : 2) Name.....

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FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Computer Science

BCS 4C 04—VISUAL PROGRAMMING

(2014—2016 Admissions)

Time : Three Hours Maximum : 64 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. OLE stands for ————————.
2. Expand CLR.
3. ———————— is not exactly a looping construct but it executes a series of statements that repeatedly refers to a single object or structure.
4. ———————— gets the number of characters in the current String object.
5. ———————— function returns a new DateTime that adds the specified number of years to the value of this instance.
6. A destructor has the name———————— and it can neither return a value nor can it take any parameters.
7. ———————— control is generally used to display some informative text on the GUI which is not changed during runtime.
8. ———————— property gets or sets the character used to mask characters of a password in a single- line TextBox control.
9. The ———————— control allows the user to set true/false or yes/no type options.

(9 × 1 = 9 marks)

Part B

Answer **all** *questions.*
Each question carries 2 *marks.*

10. What is the purpose of using Rich text box ?
11. What is the use of a timer control ?
12. What do you mean by event driven programming ?
13. How will you declare variables in VB.NET ?
14. Mention various keyboard events and explain when each event occurs.

(5 × 2 = 10 marks)

Part C

Answer any **five** *questions.*
Each question carries 5 *marks.*

15. Explain the sub procedures in VB.NET.
16. Explain with an example, the basic structure of a VB.NET program.
17. What is a Statement ? Explain different classification of statements.
18. Explain any *five* methods of DateTime object.
19. Explain choose function with an example.
20. Explain the possible values for button argument in a message box.
21. Explain various components in a dataset in ADO.NET.
22. Explain with an example, how to load data from database to a data grid ?

(5 × 5 = 25 marks)

Part D

Answer any **two** *questions.*
Each question carries 10 *marks.*

23. Explain the concept of single dimensional and multi-dimensional arrays with examples.
24. Explain the properties, methods and events of Checkbox control.
25. Explain arithmetic, comparison and logical operators in VB.NET.

(2 × 10 = 20 marks)

C 21265 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

Computer Science

BCS 4B 05—DATABASE MANAGEMENT SYSTEM AND RDBMS

(2017—2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. In mathematical term Row is referred as ———— in database management systems.
2. A ———— key is a primary key from one table that appears in another table to link the two together.
3. If every non-key attribute is functionally dependent on the primary key, the relation will be in ———— normal form.
4. BCNF stands for ————.
5. In Database Management systems, FD stands for ————.
6. The letter D in ACID properties of a transaction represents ————.
7. ———— is the language used by most of the Database Management Systems for helping their users to access data.
8. In SQL, GRANT is an example of ———— type of statement.
9. ———— is a special type of stored procedure that automatically runs when an event occurs in the database server.
10. In SQL, ———— command is used to provide system privileges, roles, and object privileges to uses and roles.

(10 × 1 = 10 Marks)

Part B

Answer **all** *questions.*
Each question carries 3 *marks.*

11. What are the disadvantages of traditional file systems ?

12. What is E-R model ?

13. What do you mean by database normalization ?

14. What is DCL command in SQL ? Give one example.

15. What are stored procedures ?

(5 × 3 = 15 marks)

Part C

Answer any **five** *questions.*
Each question carries 5 *marks.*

16. Explain the functionalities of a database administrator.

17. What is data independence ? Explain how it is achieved in Database Management Systems.

18. Give an account on relational algebraic operators.

19. Explain about functional and multivalued dependencies.

20. Explain the function and syntax of any two DCL statements is SQL.

21. Explain the differences between DROP TABLE and DROP VIEW statements in SQL.

22. Why is concurrency control needed ? Explain about uncommitted dependency anomalies.

23. Explain the various data types in SQL.

(5 × 5 = 25 marks)

Part D

Answer any **three** *questions.*
Each question carries 10 *marks.*

24. Explain the architecture of database management systems.

25. Discuss the various referential integrity constraints.

26. Compare and contrast BCNF and 3NF with examples.

27. The Employee Database Management System contains following Schema :

Employee :EmpID, Name, Address, DeptID, Designation, Salary.

Department:DeptID, DeptName, HeadID

(i) Write SQL query for retrieving the employee details (EmpID, Name, Address, DeptName, Designation and Salary) who gets maximum salary. (3 marks)

(ii) Write SQL query to list the names of all employees who earn salary more than Rs. 1,00,000 in a year. (3 marks)

(iii) Give the SQL statement for obtaining the name of the employee who heads the department where employee with EmpID = 100. (4 marks)

28. What is a Trigger ? Explain the procedure for creating triggers in SQL.

[3 × 10 = 30 marks]

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FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2022

Computer Science

BCS4B06—FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEM AND RDBMS

(2014—2016 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. ———— is a collection of interrelated data and a set of programs to access those data.
2. Entities are described in a database by a set of ————.
3. The collection of information stored in the database at a particular moment is called an ———— of database.
4. The participation of an entity set E in a relationship set R is said to be ———— if every in E participates in at least one relationship in R.
5. The union, ————, and Cartesian product are called binary operations.
6. By default, ———— clause lists items in ascending order.
7. A domain is ———— if elements of the domain are considered to be indivisible units.
8. Expand PJNF.
9. A transaction is said to have ———— if has either committed or aborted.
10. ———— is a collection of stored procedure and functions.

(10 × 1 = 10 marks)

Part B (Short Answer)

Answer **all** *questions.*
Each question carries 2 *marks.*

11. What is the primary goal of DBMS ?
12. What is weak entity ?

13. What is transitive dependency ?

14. What do you mean by durability in transaction concept ?

15. What is deadlock ?

(5 × 2 =10 marks)

Part C (Short Essay)

Answer any **five** *questions.*
Each question carries 4 marks.

16. Compare physical level and logical levels of data abstraction.

17. What are the merits of using DBMS approach ?

18. What is the use of DML? What are the basic types of DML ?

19. What are the types of attributes used in E-R model ?

20. Write a note on substring pattern matching.

21. What is 4NF? How is it differ from BCNF ?

22. Briefly explain the lost update problem in concurrent execution.

23. What are the levels of locks ?

(5 × 4 = 20 marks)

Part D (Essay)

Answer any **five** *questions.*
Each question carries 8 marks.

24. What are the major disadvantages of keeping organizational information in a file processing system? Explain.

25. Discuss the set of symbols used in the E-R diagrams.

26. Explain the people who work with a database.

27. Discuss the basic structure of an SQL expression with example.

28. Discuss the group by and having clauses in SQL

29. Explain the first three normal forms used in the relational-database design.

30. Discuss the transaction state with diagram.

31. Discuss two-phase locking.

(5 × 8 = 40 marks)

C 3520 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Computer Science

BCS 4B 05—DATABASE MANAGEMENT SYSTEM AND RDBMS

Time : Two Hours Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. What is the difference between database schema and database instance ?
2. What is meant by E-R models ?
3. What is meant by weak entity ?
4. What is the meaning of foreignkey ?
5. Define functional dependency.
6. What is the impact of primary key constraint ?
7. Describe DCL.
8. What is view ? How to create view ?
9. What is Alter command in SQL ?
10. What is BCNF ?
11. What is atomicity in DBMS ?
12. What do you mean by two-phase locking ?

(8 × 3 = 24 marks)

Section B (Short Essay Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. What is data independence ? Explain the difference between physical and logical data independence.
14. Explain the different types of attributes occurs in E-R model.

Turn over

15. Explain domain relational calculus with example.

16. Discuss the aggregate functions with examples.

17. Explain with example, the concept of nested queries.

18. Describe ACID properties of transaction.

19. Write SQL statements : (1) to create the table STUDENT(Name, Class, Mark, Rank), (2) to display the name and class of students with the descending of rank (3) List the details of students whose mark less than 60 and greater than 50.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*

The question carries 11 *marks.*

20. What is data base ? Describe the advantages and disadvantages of using DBMS.

21. What is normalization ? Explain 1NF, 2NF and 3NF with example.

(1 × 11 = 11 marks)

C 2176 (Pages : 2) Name.....

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FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Computer Science

BCS 4C 04—DATA STRUCTURE USING C PROGRAMMING

(2017 Admissions)

Time : Three Hours Maximum : 64 Marks

Section A

Answer **all** *questions.*

Each question carries 1 *mark.*

1. Define Data Structure.
2. Define complexity of algorithms.
3. Matrices with high proportion of zero entries are called ————.
4. ———— is a list of a finite number n homogeneous data elements.
5. A header linked list always contains a special node called ————.
6. Write one example for linear data structure.
7. If the size of the stack is 10 and we try to add 11^{th} element in to the stack, the condition is called ————.
8. Define a queue.
9. ———— refers to the operation of finding the location of a given item in a collection of items.

(9 × 1 = 9 marks)

Section B

Answer **all** *questions.*

Each question carries 2 *marks.*

10. Differentiate between primitive data types and abstract data types.
11. Briefly explain sparse matrix representation with example.
12. Write a procedure to PUSH an item onto the stack and delete the top item from the stack.
13. Define circular queue and Deque.
14. What is the difference between linear and binary search ?

(5 × 2 = 10 marks)

Turn over

Section C (Short Essay Type)

Answer any **five** *questions.*
Each question carries 5 *marks.*

15. Define 2D array. Explain how 2D arrays are represented in memory.
16. What is the difference between a queue and a stack ?
17. Write a program for traversing a linked list with suitable example.
18. What are the applications of stack and queue ?
19. Write the procedure for inserting an element into the array.
20. Briefly explain doubly linked list. Write a program for inserting a new node into a doubly linked list.
21. Explain the working of selection sort.
22. Briefly explain linear search and binary search algorithms. Compare both.

(5 × 5 = 25 marks)

Section D (Long Essay Type)

Answer any **two** *questions.*
Each question carries 10 *marks.*

23. Explain any two types of sorting with example.
24. Explain insertion and deletion operations in a queue.
25. Write notes on : a) Header linked list b) Priority queue.

(2 × 10 = 20 marks)

C 2175 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Computer Science

BCS 4C 04—VISUAL PROGRAMMING

(2014 Admissions)

Time : Three Hours Maximum : 64 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. ———————— are the standard prefixes for the button and combo-box controls in .Net.
2. In VB.Net which data type accepts only true or false values.
3. What does FCL stands for ?
4. Which keyword is used to convert a string to number ?
5. ———————— property in array class of VB.Net returns an integer indicating the number of dimensions of the array.
6. Which statement is used to select specific field from a table ?
7. OLE stands for ————————.
8. Group Box is similar to ————————.
9. The first step of configuring a DataAdapter is to select ————————.

(9 × 1 = 9 marks)

Part B

Answer **all** *the questions.*
Each question carries 2 *marks.*

10. What do you mean by event driven programming ?
11. What is with statement? Explain with syntax and example.
12. What is the function of MsgBox and Input Box ?

13. How can you validate the data user enter into controls ?

14. How do you access data using data adapter control ?

(5 × 2 = 10 marks)

Part C

Answer any **five** *questions.*
Each question carries 5 *marks.*

15. Explain the concept of event driven programming.

16. Explain different parts of VB IDE

17. What are the different properties and key words used for Date and Time ?

18. What is the use of Do Loop ? Explain different types.

19. Explain any five basic controls with examples.

20. Explain object and classes in VB.

21. How to create Label using Label class ? Explain with suitable example.

22. Write down the code needed for moving next, previous and first record of a data set.

(5 × 5 = 25 marks)

Part D

Answer any **two** *questions.*
Each question carries 10 *marks.*

23. What is an exception ? Explain different exception handling techniques used in VB.

24. What are the different decision and selection making statements ? Explain each with example.

25. Write short notes on :

    (a) String functions used in VB.

    (b) Handling of multiple forms.

    (c) Text boxes and Rich Text Boxes.

    (d) Accessing data with the server explorer in ADO.NET.

(2 × 10 = 20 marks)

C 2174 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Computer Science

BCS 4B 05—DATABASE MANAGEMENT SYSTEM AND RDBMS

(2017 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. What is a Database System ?
2. Define Schema in a Database.
3. What do you understand by Data Model ?
4. What is a Weak Entity ?
5. What is Relational Algebra ?
6. Which normal form is considered adequate for normal relational database design ?
7. DDL stands for ————————.
8. ———————— is a virtual table, through which a selective portion of the data from one or more tables can be seen.
9. What do you mean by durability in DBMS ?
10. What is RDBMS ?

(10 × 1 = 10 marks)

Part B

Answer **all** *questions.*
Each question carries 3 *marks.*

11. Define Normalization. Explain 2NF.
12. Define different DDL commands.

Turn over

13. What is E-R model ?

14. What is stored procedure ?

15. What is the function of Grant and Revoke commands ?

(3 × 5 = 15 marks)

Part C

Answer any **five** *questions.*
Each question carries 5 *marks.*

16. Discuss the differences between database systems and information retrieval systems.

17. Explain the concept of Primary Key and Foreign Key.

18. Write a comparison on tuple calculus and domain calculus ?

19. Explain different control structures in SQL.

20. What are the Relational database design Anomalies in a Database ?

21. What is view in SQL ? How to create a view from multiple tables ?

22. Write a short note on generalization and specialization ?

23. Explain ACID properties.

(5 × 5 = 25 marks)

Part D

Answer any **three** *questions.*
Each question carries 10 *marks.*

24. Define DBMS. What are the advantages of DBMS over traditional file system ?

25. Explain Relational Algebra and its various operatioas.

26. Explain Boyce Codd Normal Form and Fourth Normal Form.

27. Write a short note on :

    (A) Built in Function in SQL (B) Aggregate Functions in SQL.

28. Explain different Concurrency Control Protocols in DBMS.

(3 × 10 = 30 marks)

C 2173 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Computer Science

BCS 4B 06—FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEM AND RDBMS

(2014 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 1 *mark.*

1. A collection of centrally controlled, integrated, and logically organized data is known as ————.
2. In an ER diagram ellipsis represents ————.
3. DDL stands for ————.
4. ————can act as both super key as well as candidate key.
5. If every non-prime attribute A of a relation R is fully functionally dependent on the primary key of R then R is said to be in ————.
6. In the ———— normal form, a composite attribute is converted to individual attributes.
7. ACID properties stand for ————.
8. The cardinality of the resultant relation of a Cartesian product operation on two relations with cardinality of 5 and 6 each is ————.
9. The command to remove rows from a table 'CUSTOMER' is ————.
10. A ———— is a PL/SQL block that fires or executed in response to a specific event in the database.

(10 × 1 = 10 marks)

Part B

Answer **all** *the questions.*
Each question carries 2 *marks.*

11. Differentiate between primary key and foreign key.
12. Define entity integrity rule
13. Define 2NF.
14. Explain the Two-Phase Locking protocol.
15. Explain the basic built-in data types in SQL.

Part C

Answer any **four** *questions.*
Each question carries 5 *marks.*

16. Explain various advantages of using DBMS approach.
17. Explain about EER with an example.
18. Differentiate between relational algebra and relational calculus.
19. Explain with example, the use of GROUP BY HAVING clause in SQL.
20. Consider the following relations :

    Emp(eid, ename, age, salary)

    Works(eid, did, time)

    Department(did, dname, budget, managerid)

    Write SQL DDL statements required to create the above relations with necessary constraints.
21. Explain with an example, the concept of 3NF.
22. List the ACID properties. Explain the usefulness of each.
23. Explain the concept of a stored procedure by writing a simple real-life example.

(4 × 5 = 20 marks)

Part D

Answer any **five** *questions.*
Each question carries 8 *marks.*

24. Explain with a neat diagram, the three-level architecture of a DBMS.
25. Explain about various uses of a database system with prime importance to their duties.
26. Draw an ER diagram for an educational institution. Identify the appropriate entities, attributes and relationships.
27. Explain the fundamental operations in relational algebra with suitable examples.
28. Give an example of a relation schema R and a set of functional dependencies such that R is in 3NF but not in BCNF.
29. a) What are the major problems caused by redundancy ?

    b) Explain with example, Lossless-join decomposition.
30. Write short notes on :

    a) Concurrency control mechanism in transaction management.

    b) Triggers and cursors.

31. Consider the following schema :

Suppliers(sid, sname, address)

Parts(pid, pname, colour)

Catalog(sid, pid, cost)

The Catalog relation lists the prices charged for Parts by Suppliers. Write SQL statements for the following queries.

a) Find the pnames of parts for which there is some suppliers.

b) Find the pnames of parts supplied by ABC suppliers.

c) Find the snames of suppliers who supply every red part.

d) Find the sids of suppliers who supply a red part and a green part.

(5 × 8 = 40 marks)

C 3521 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION APRIL 2021

Computer Science

BCS 4C 04—DATA STRUCTURE USING C PROGRAMMING

Time : Two Hours Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 *marks.*
All questions can be attended.
Overall Ceiling 24.

1. What is ADT ? Specify its significance.
2. What are data structures ? List out various linear data structures.
3. Explain the time complexity of an algorithm with example.
4. What are the advantages of an array variable ?
5. How to represent a sparse matrix in memory ?
6. What are the advantages of a dynamic memory allocation in linked list representation ?
7. What is the basic concept of a doubly linked list ?
8. What is stack organization ? Specify the significance of the term "Top of the stack".
9. Develop an algorithm to insert an element in to a queue.
10. Explain one of the applications of a queue.
11. What is sort procedure ? Specify its advantages.
12. What are the complexity specifications of search algorithms ?

(8 × 3 = 24 mark

Section B (Short Essay Type Questions)

Answer at least **five** *questions.*
Each question carries 5 *marks.*
All questions can be attended.
Overall Ceiling 25.

13. Explain the classification of data structures with examples. Also, specify the advantages of a dynamic data structures.

14. What are two dimensional arrays ? How to represent a two dimensional array in memory.

15. Develop an algorithm to insert a node in a singly linked list.

16. Explain various types of deques and its advantages with suitable example.

17. Explain the implementation of a stack in an array.

18. Illustrate the working of a bubble sort procedure with proper example.

19. Explain the linear search procedure with supporting algorithms.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 *marks.*

20. What are the features of a circular queue ? Explain the implementation of a circular queue using arrays.

21. Discuss the quick sort procedure with suitable example.

(1 × 11 = 11 marks)