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BCA 3rd Semester (Full & Re-appear)

Examination, December-2024

DATA STRUCTURE-I

Paper : BCA-202

Time allowed : 3 hours]

[Maximum marks : 80

Note : Attempt five questions in all. Question No. 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each unit. All questions carry equal marks.

1. Explain the following :

8×2=16

- (a) Data Structure
- (b) String
- (c) Parallel arrays
- (d) Threaded lists
- (e) Deques
- (f) Uses of trees in data structure
- (g) Graph theory
- (h) Define Tree.

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[P.T.O.]



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Unit-I

1. Explain the following in detail : $2 \times 8 = 16$

(a) Categories of Data structures

(b) Applications of data structures

Explain the concept of storing strings, string operations and Pattern matching algorithms in detail. 16

Unit-II

What is Linked list? What are the advantages and disadvantages of representing a group of items as an array versus a linear linked list? 16

Explain the following in detail :

(a) Linear arrays and Representation of linear array in memory 8

(b) Header linked list and circular linked list with example. 8

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Unit-III

6. (a) What is Stack? Explain the different operations on stacks in detail. 8

(b) Explain the applications of stack in detail. 8

7. What is Queues? Explain the concept of priority queues in detail. Also explain the applications of queues in detail. 16

Unit-IV

8. Explain the following in detail : $2 \times 8 = 16$

(a) Traversing binary trees

(b) Traversal algorithms using stacks

9. What is Graph? Explain Sequential and Linked representation of graphs in detail. 16

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Introduction to Operating System

Paper : BCA-201

Time allowed : 3 hours]

[Maximum marks : 80

Note : Question No. 1 is compulsory. Attempt four questions by selecting one question from each unit. All questions carry equal marks.

1.
 - (a) What is the concept of thrashing?
 - (b) What is process states diagram?
 - (c) What is Critical Section?
 - (d) What is Queue scheduling algorithm?
 - (e) What is Real-time Scheduling?
 - (f) What do you mean by free space management?
 - (g) What are Bernstein's Conditions?
 - (h) What should be page size? Justify your answer.

8×2=16

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[P.T.O.]



Unit-I

2. (a) What are operating system services? Discuss their significance. 6
- (b) What is an operating system? What are important characteristics of a good operating system? Also discuss the responsibilities of an operating system as a resource manager. 10
3. Differentiate between the following :
- (a) Program, process and thread 6
- (b) Multitasking and Batch processing 5
- (c) Time-sharing and Multiprogramming 5

Unit-II

4. Differentiate 'Deadlock-Avoidance', 'Deadlock-Prevention' and 'Deadlock-Detection'. What is Banker's algorithm and indicate for which of the above three the same is used? Illustrate the same through a suitable example. 16
5. What do you mean by a scheduler? What should be the performance criteria for a scheduler? Compare and contrast importance scheduling techniques. 16

Unit-III

6. (a) What is fragmentation? What are different types of fragmentation? How each of these can be overcome? Explain. 7
- (b) What is paging? How address mapping is performed in paging technique? Also enumerate the advantages and disadvantages of paging. 9
7. (a) What is memory management? Discuss objectives of memory management. 6
- (b) What is a Swapping System? Consider a swapping system in which memory of the following hole sizes in memory order : 10K, 4K, 20K, 18K, 7K, 9K, 12K and 15K. Which hole is taken for successive requests of : 10
- (i) 12K
- (ii) 10K
- (iii) 9K
- for first-fit? Repeat the same for Best-Fit, Worst-Fit and Next-Fit.

Unit-IV

8. What is meant by disk scheduling? Explain why disk scheduling is necessary? Enumerate the principal differences among various disk-scheduling techniques. 16

9. What is a file-system? Give the general model of a file-system? What are the main responsibilities of a file-system? Where is file-system located in layered organization of operating system? 16

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BCA 3rd Semester (Full & Re-appear)

Examination, December-2024

Communication Skills (English)

Paper : BCA-204

Time allowed : 3 hours]

[Maximum marks : 80

Note : Attempt five questions in all, selecting one question from each unit. **Question No. 1 is compulsory.**

1. (a) Write a short note on the scope of communication.
- (b) What is communication process?
- (c) What do you mean by non-verbal communication?
- (d) What is dyadic communication?
- (e) Make the words, using the following prefixes:
 - (i) dis _____
 - (ii) Ex _____
- (f) Make the words, using the following suffixes:
 - (i) _____ ent
 - (ii) _____ tion
- (g) What are the barriers to public speaking?
- (h) What are the objectives of interview? $8 \times 2 = 16$

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[P.T.O.]

Unit-I

2. (a) Discuss the features of Communication. 8
 (b) What are the principles of communication? 8
3. (a) Explain the process of communication. 8
 (b) What do you mean by communication barriers? Explain their important causes. 8

Unit-II

4. (a) State the disadvantages of verbal communication. 8
 (b) Define non-verbal communication and explain its importance. 8
5. (a) Explain the role of effective listening in communication. 8
 (b) Define soft skills. How these can be developed? 8

Unit-III

6. (a) Give one word substitute of any five of the following : 5
 (i) One who does not care for art, literature etc.
 (ii) Men living in the same age.

- (iii) A game or battle in which neither party wins.
 (iv) One who thinks only of oneself.
 (v) One who is not easily pleased.
 (vi) That which cannot be read.
 (vii) A story that can hardly be believed.
 (viii) A sound that cannot be heard.
- (b) Form the words, using the following prefixes : 6
 (i) Un _____
 (ii) Dis _____
 (iii) Im _____
 (iv) Ir _____
 (v) Ch _____
 (vi) Re _____
- (c) Fill in the blanks with appropriate prepositions : 5
 (i) He is senior _____ me.
 (ii) He died of _____ cancer.
 (iii) He reached the station _____ 6 O'clock.
 Fill in the blanks with articles :
 (iv) He was _____ intelligent student.
 (v) It is _____ European Ship.

7. (a) Explain the various ways which help us to improve vocabulary. 8
- (b) In what way we develop our fluency with the help of language games? 8

Unit-IV

8. (a) Explain the points we should keep in mind in organizing a public speech. 8
- (b) What are the ways which are essential for an effective speech? 8
9. (a) What are the characteristics of an effective presentation? 8
- (b) What are the major points for the preparation for professional interviews? 8

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B.C.A. 3rd Semester (Full & Reappear)

Examination, December - 2024

INTRODUCTION TO DATABASE SYSTEMS

Paper -BCA-203

Time allowed : 3 hours]

[Maximum marks : 80

Note : *Question No. 1 is compulsory. Attempt five questions in total, the first being compulsory and select one question from each unit.*

1. (a) What is Data independence? 2
- (b) What is Data Abstraction? Explain by taking suitable example. 2
- (c) Differentiate between Data and Information. 2
- (d) Who are database designers? How are they different from Application developers? 2
- (e) What is conceptual modeling? 2
- (f) What are ER diagrams? 2
- (g) Define functional dependency. 2
- (h) Write the "INSERT" command of SQL by taking an examples. 2

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Unit - I

2. What is Database system? How is Database system different from a traditional file-based system? Explain its components, advantages, and disadvantages in detail.

16

3. (a) What is a Database Management System? What are the main functions of a DBMS? Explain. 8

(b) Write short note on the following : $2 \times 4 = 8$

(i) DBMS Languages

(ii) Database Administrator

Unit - II

4. (a) Explain the Three-level architecture of a DBMS.

8

- (b) What is data independence? Differentiate between logical Data independence and physical data independence. 8

5. Differentiate between the following: $2 \times 8 = 16$

(a) Centralized and Client-server architecture of DBMS.

(b) Record-based and Object-based data models.

Unit - III

6. Write short note on the following : $2 \times 8 = 16$

(i) Entity Relationship Model

(ii) Role of Abstraction and Integration of Data in DBMS

7. What are data models? Explain Hierarchical, Network and Relational Data models in detail. 16

Unit - IV

8. (a) What is relational Algebra? Explain in detail. 8

(b) What are Normal forms? Explain the different Normal Forms in detail with the help of examples.

8

- Q 9. (a) What is Query Processing? How do we optimize a query? Explain its algorithms. 8
- (b) What is SQL? Explain the various types of SQL commands. 8