KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY
Hiranya Chandra Bhuyan School of Science and Technology
Home Assignment

Diploma in Computer Science (DCS)/
Master of Science in Information Technology (M.Sc.IT)

Course: COMPUTER ORGANIZATION AND ARCHITECTURE
2nd Semester, 2024
Total Marks: 50

- **The Home Assignment should be written in your own language only.**
- **Copying from the Self Learning Material or from others shall result in deduction of marks.**
- **The last date of submission of the Home Assignment is 30/06/2024.**

Q1. Discuss the principles of computer arithmetic and its relevance to computer architecture. Describe the representation of integer and floating-point numbers in digital computers, including signed-magnitude, one's complement and, two's complement. (10)

Q2. Discuss the concept of cache memory and its role in improving system performance. Explain the principles of cache organization, including cache mapping techniques. (10)

Q3. Explain the concept of virtual memory and its implementation in modern computer systems. Discuss the benefits of virtual memory in enhancing system performance and managing memory resources efficiently. (10)

Question related to environment

Q4. Assess the effectiveness of current waste management practices in your community or country. Analyze the challenges posed by increasing levels of waste generation and propose innovative solutions for reducing, recycling, and managing waste more sustainably. (10)

Additional question in lieu of MCQ

Q5. Discuss the operation of Interrupt-Driven I/O in computer systems. Explain how interrupts are used to handle asynchronous events and prioritize I/O operations. Describe the steps involved in servicing an interrupt request and the role of interrupt handlers in managing I/O operations efficiently. (10)

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Home Assignment

Diploma in Computer Science (DCS)/
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Course: DATA STRUCTURE IN C LANGUAGE
2nd Semester, 2024
Total Marks: 50

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Q1. Why are stacks called "LIFO" structures? Explain the push and pop operations. (10)

Q2. Show all the passes using the Bubble Sorting technique with the following list–

25, 46, 78, 90, 31, 4, 19, 89, 55, 62 (10)

Q3. Describe how rotations are done in AVL trees using examples. (10)

Question related to environment

Q4. Assess the potential of renewable energy sources, such as solar, wind, and hydropower, in mitigating greenhouse gas emissions and reducing reliance on fossil fuels. Discuss challenges and opportunities associated with the transition to a renewable energy economy. (10)

Additional question in lieu of MCQ

Q5. Construct a binary search tree with following data and find out the inorder, preorder and postorder traversal of the tree: **4, 2, 8, 13, 6, 20, 40, 12, 17** (10)

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Home Assignment

Diploma in Computer Science (DCS)/
Master of Science in Information Technology (M.Sc.IT)

Course: FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEM
2nd Semester, 2024
Total Marks: 50

- **The Home Assignment should be written in your own language only.**
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- **The last date of submission of the Home Assignment is 30/06/2024.**

Q1. Design a conceptual schema for a university's student information system, considering entities such as students, courses, instructors, and enrolments. Illustrate your schema using an entity-relationship diagram (ERD) and explain the cardinality and participation constraints associated with each relationship. (10)

Q2. Evaluate the impact of database normalization on data integrity, storage efficiency, and query performance. Discuss the principles of normalization (e.g., 1NF to BCNF) and their practical implications in designing relational database schemas. Illustrate your arguments with relevant scenarios and propose strategies for balancing normalization against denormalization in database design. (10)

Q3. Compare and contrast deadlock prevention and deadlock avoidance strategies in database management systems. Discuss the advantages, disadvantages, and implementation considerations of each approach. Provide real-world examples where each strategy would be most suitable and analyze the trade-offs involved in their selection. (10)

Question related to environment

Q4. Examine the effectiveness of governmental policies in addressing air pollution in urban areas. Evaluate the role of regulatory measures, public awareness campaigns, and technological innovations in reducing air pollutants and improving air quality. Discuss the challenges faced in implementing and enforcing these policies and suggest potential solutions. (10)

Additional question in lieu of MCQ

Q5. Design a relational database schema for a book store system that includes entities such as books, authors, customers, and orders. Discuss the normalization process applied to ensure data integrity and minimize redundancy. Provide illustrative examples of SQL queries to demonstrate the functionality of your database design. (10)

N.B. The learners will have to collect receipt after submitting the assignment with the signature and seal of the collector of study centre and will have to keep with him/her till the declaration of result.

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Receipt

Received the assignment from Mr/Ms …….…….

Enrollment number……of DCS 2nd semester(2024) on…….....2024.

Date:

Signature of collector with seal: