K24U 3535

Reg. No. : .....

Name : .....

III Semester B.C.A. Degree (C.B.C.S.S. – O.B.E.-Regular/Supplementary/ Improvement) Examination, November 2024
(2019 to 2023 Admissions)
General Awareness Course
3A12BCA : DATA STRUCTURES

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **(6×1=6)**

1. What is linear data structure ?
2. List the ways to represent a two-dimensional array in memory.
3. Convert the equation to prefix : A*B/(C – D)+E.
4. What do you mean by stack overflow ?
5. What do you mean by LIFO data structures ?
6. What is the content of the link part of the last node in a linked list ?

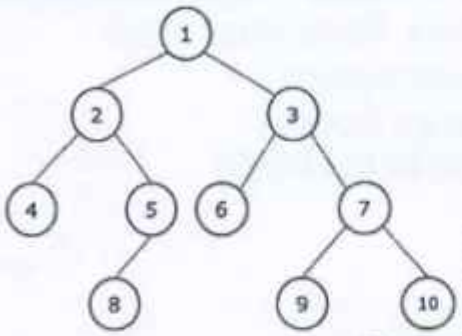
PART – B
(Short Essay)

Answer **any 6** questions. **(6×2=12)**

7. Describe the features of the insertion sort method.
8. What are the limitations of the linear search method ?
9. Write an algorithm to perform the insertion of a number into a linear queue.
10. Write a short note on the dequeue.
11. Describe the basic structure of a Linked List node.

P.T.O.

12. Describe the process of deleting a node from a linked list.
13. Describe the depth and height of a binary tree with an example.
14. Perform preorder traversal of the binary tree given below.



PART – C
(Essay)

Answer **any 4** questions. **(4×3=12)**

15. Briefly explain the representation of a sparse matrix using an array and linked list.
16. Write a note on the binary search method.
17. Compare and contrast the sorting algorithms : quick sort and merge sort.
18. What is a priority queue ? Explain the priority queue representation using the linked list.
19. Write an algorithm to merge two sorted linked lists.
20. Write a short note on Huffman code. Illustrate an example.

PART – D
(Long Essay)

Answer **any 2** questions. **(2×5=10)**

21. What are the various types of recursion ?
22. Write a function or algorithm to implement a stack using a linked list.
23. Explain various types of linked lists.
24. Explain BST and its operations with an example.

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III Semester B.C.A. Degree (C.B.C.S.S. – O.B.E.-Regular/Supplementary/ Improvement) Examination, November 2024
(2019 to 2023 Admissions)
General Awareness Course
3A13BCA : DATABASE MANAGEMENT SYSTEM

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **(6×1=6)**

1. What does ACID refer to in the context of transaction management ?
2. What is the significance of integrity rules ?
3. What is meant by lossless decomposition ?
4. What is sequence cycling ?
5. What is a subquery in SQL ?
6. What keyword is used to check if a value exists in the result of a subquery ?

PART – B
(Short Essay)

Answer **any 6** questions. **(6×2=12)**

7. Explain the difference between a naive user and a sophisticated user.
8. What are the two primary responsibilities of a database administrator ?
9. Give a practical example that shows the use of a division operator.
10. What is the difference between a relation and a relationship in a relational database ?

P.T.O.

11. What is a composite key in a relational database ?
12. Write a short note on SQL datatypes.
13. Explain the concept of stored procedures.
14. Write an update statement to increase the salary of all employees in the "IT" department by 10%. Include a condition to limit the raise to employees with a current salary less than $100,000.

PART – C
(Essay)

Answer **any 4** questions. **(4×3=12)**

15. Describe the WITH CHECK OPTION clause in view of creation and its importance.
16. Discuss three advantages of the object-oriented data model.
17. Explain the concept of cardinality in data modeling and give examples.
18. Describe the concept of functional dependency in database normalization.
19. Compare and contrast relational algebra and relational calculus.
20. Describe the purpose and syntax of the ALTER TABLE command. Provide an example of adding a new column to an existing table.

PART – D
(Long Essay)

Answer **any 2** questions. **(2×5=10)**

21. Discuss the limitations of the ER model. What alternatives or extensions have been proposed to address these limitations ?
22. Describe the join operation in relational algebra, including its variants, and provide examples.
23. Describe the purpose and structure of the SELECT statement. Write a SELECT query that joins two tables and includes sorting and filtering.
24. Explain the differences between scalar, inline table-valued and multi-statement table-valued functions.

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III Semester B.C.A. Degree (C.B.C.S.S. – O.B.E.-Regular/Supplementary/ Improvement) Examination, November 2024
(2019 to 2023 Admissions)
Core Course
3B06BCA : INTRODUCTION TO MICROPROCESSORS

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **(6×1=6)**

1. What is the role of the bus system in a processor ?
2. What is the basic word size of the Intel 8085 microprocessor ?
3. Specify the use of the 8086 assembly language directive, SEGMENT.
4. What is the benefit of bit preservation in rotate instructions ?
5. What is meant by 'cycle stealing' in the 8257 DMA controller ?
6. How many interrupt request lines does the 8259A support ?

PART – B
(Short Essay)

Answer **any 6** questions. **(6×2=12)**

7. What are the functions of the control unit ?
8. How does pipelining improve the performance of a microprocessor ?
9. What is the significance of data transceivers in 8086 ?
10. Describe the following 8086 assembly language instructions : push and pop.

P.T.O.

11. Explain the effect on the carry flag when a rotate operation is performed.
12. What is the ENTER command in stack frame management ?
13. What are the various types of interrupts in 8086 ?
14. Discuss the role of the following pins in the 8257 DMA controller. DACK and DREQ.

PART – C
(Essay)

Answer **any 4** questions. **(4×3=12)**

15. Explain Moore's Law and its impact on microprocessor development.
16. How does the 8086 handle I/O operations ?
17. Describe the purpose and usage of the following 8086 assembly language instructions : MUL, DIV.
18. Explain the structure of a typical 8086 assembly language program.
19. Explain the interrupt priority system in the 8086.
20. Describe the benefits and drawbacks of the interrupt-driven I/O method.

PART – D
(Long Essay)

Answer **any 2** questions. **(2×5=10)**

21. Explain the role of the stack pointer and the program counter in 8085.
22. Explain the purpose and functioning of the bus interface unit in the 8086 architecture.
23. Describe how the 8086 handles interrupts using the stack.
24. Explain the concept of Direct Memory Access (DMA). How does it improve system performance, and what are its key components ?

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III Semester B.C.A. Degree (C.B.C.S.S. – O.B.E.-Regular/Supplementary/ Improvement) Examination, November 2024
(2019 to 2023 Admissions)
Core Course
3B07BCA : JAVA PROGRAMING

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **(6×1=6)**

1. What do you mean by JVM ?
2. Mention any two properties of a constructor.
3. What do you mean by exceptions ?
4. Write the syntax of applet tag.
5. Expand the term AWT.
6. List out various any four event listeners in Java.

PART – B
(Short Essay)

Answer **any 6** questions. **(6×2=12)**

7. Write a Java program to add two complex numbers using object and class.
8. Mention any four methods of StringBuffer class in Java.
9. Explain how to create a child thread by inheriting Thread class.

P.T.O.

10. What do you mean by method overriding ?

11. Write syntax to declare a user defined class in Java.

12. Mention the purpose of File Input Stream in Java.

13. Write short note on delegation event model.

14. Write short note on Thread life cycle in Java.

PART – C
(Essay)

Answer **any 4** questions. **(4×3=12)**

15. Briefly explain string class in Java.

16. Write a Java program to implement applet life cycle.

17. Write short note on thread priorities.

18. Short note on random access file.

19. Write short note on Graphics class.

20. Explain the concept of interfaces in Java with suitable example.

PART – D
(Long Essay)

Answer **any 2** questions. **(2×5=10)**

21. Describe various features of Java programming language.

22. Explain try...catch...finally statement in Java with a suitable example.

23. Explain RadioButton and Choice class in Java.

24. Briefly explain any two layout managers in Java

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III Semester B.Sc. Degree (CBCSS – Supplementary) Examination, November 2024
(2018 Admission)
COMPLEMENTARY COURSE IN MATHEMATICS
3C03MAT-BCA : Mathematics for BCA – III

Time : 3 Hours Max. Marks : 40

SECTION – A

All the first **4** questions are **compulsory**. **They** carry **1** mark **each**. **(4×1=4)**

1. Under what condition the equation $(ax + by)dx + (kx + ly)dy = 0$ exact.
2. Evaluate $(D + 5)^2 (5x + \sin 5x)$.
3. State the linearity of the laplace transform.
4. Give an example of a even function.

SECTION – B

Answer **any 7** questions from among the **5** to **13**. **These** questions carry **2** marks **each**. **(7×2=14)**

5. Solve $2\frac{dy}{dx} = y \cot x$.
6. Solve $(1 + x^2)dy + 2xydx = 0$.
7. Find the orthogonal trajectories of the family of curves $x^2 - y^2 = c$.
8. Reduce to first order and solve $y'' = 2y' \coth 2x$.
9. Solve $8y'' - 2y' - y = 0$.
10. Find L(t cosh at).
11. Find the value of c if $u = x^2 + t^2$ is a solution of one dimensional wave equation $u_{tt} = c^2 u_{xx}$.

P.T.O.

12. Solve $u_y = u$.

13. Solve $u_x - u_y = 0$ by separating variables.

SECTION – C

Answer **any 4** questions from among the **14** to **19**. **These** questions carry **3** marks **each**. **(4×3=12)**

14. Solve $\frac{dy}{dx}\cos y + x\sin y = 2x$.

15. Reduce to Cauchy's form and solve $2(3z + 1)^2 y'' + 21(3z + 1) y' + 18y = 0$.

16. Evaluate $L^{-1}\left(\frac{6s-4}{s^2-4s+20}\right)$.

17. Using laplace transform solve $y'' + y = t$ given $y(0) = 1$. $y'(0) = 2$.

18. Express $f(x) = \pi - x$. $0 \le x \le \pi$ as sin series.

19. Solve $xu_{xy} = yu_{yy} + u_y$ using the transformation $v = x$ and $z = xy$.

SECTION – D

Answer **any 2** questions from among the **20** to **23**. **These** questions carry **5** marks **each**. **(2×5=10)**

20. What curves in the xy-plane have the property that at each point (x. y) their tangent has the slope $-4x/y$?

21. Solve $(x^2 D^2 + xD - 9) y = 48x^5$.

22. Using Convolution property evaluate $L^{-1}\left(\frac{1}{s^2(s-a)}\right)$.

23. Find Fourier series for $|x|$ in $[-\pi, \pi]$, and deduce that
$\frac{\pi^2}{8} = 1 + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \ldots$