K21U 1935

Reg. No. : .....

Name : .....

III Semester B.C.A. Degree CBCSS (OBE) Reg./Sup./Imp. Examination November 2021
(2019-2020 Admission)
General Awareness Course
3A12BCA : DATA STRUCTURES

Time : 3 Hours

Max. Marks : 40

PART – A
Short Answer

Answer **all** questions. **(6×1=6)**

1. What do you mean by Data Structure ?
2. What is Recursion ?
3. What is time complexity of a binary search ?
4. What is merge sort ?
5. Name the operations used in stack.
6. Define circular linked list.

PART – B
Short Essay

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

7. Define Sparse matrix.
8. Explain selection sort.
9. What is the advantage of Doubly linked list ?
10. Explain Huffman code.

P.T.O.

11. What is linked list ?
12. How to insert an element into a linked list ?
13. Write down the algorithm for Post-order traversal.
14. Define Binary Tree.

PART – C
Essay

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

15. Write down the algorithm for Tower of Hanoi.
16. How to represent array in memory ? What are the operations of an array ?
17. Write down the algorithm for quick sort.
18. Differentiate linear search and binary search.
19. Convert the following expression to postfix and prefix : P / Q + R – S * T / U.
20. Write down the algorithm for search an element from a sorted linked list.

PART – D
Long Essay

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

21. Explain the linked list operations.
22. Write an algorithm for conversion of infix to postfix expression. Explain.
23. Write down the memory representation of binary tree and binary search tree.
24. Define the following :
    a) Queue
    b) Deque
    c) Priority Queue.

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(2019 – 2020 Admission)
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 are the various kinds of interactions catered by DBMS ?
2. What is a relation ?
3. What is an entity ?
4. Who proposed the relational model ?
5. Define database instance.
6. Define integrity constraints.

PART – B
(Short Essay)

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

7. List the pitfalls in Relational Database Design.
8. What is query optimization ?
9. Distinguish conceptual view and end user view.
10. Write the general syntax of delete command.
11. Discuss the role of DBA.
12. Why does SQL allow duplicate tuples in a table ?
13. What do you mean by INF ?
14. Write a note on Mapping Cardinality.

P.T.O.

PART – C
(Essay)

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

15. What is normalization ? What is its role in database design ?
16. What is a view in SQL ? Describe the procedure for renaming a column of a view .
17. What are the basic concepts of E-R model ?
18. Write short note on anomalies in a database.
19. Explain the use of ORDER BY clause in SQL.
20. Write short notes on authorisation mechanisms available in SQL.

PART – D
(Long Essay)

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

21. Draw and Explain the overall system structure of DBMS.
22. Draw an ER-diagram for a library database system. Identify the appropriate entities, attributes and relationships.
23. Explain the concept of lossless join decomposition with an example.
24. Discuss in detail the operators SELECT, PROJECT, UNION with suitable examples.

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III Semester B.C.A. Degree CBCSS (OBE) Reg./Sup./Imp. Examination, November 2021
(2019 – 2020 Admission)
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 immediate addressing mode ?
2. Explain AX Register.
3. What is pipelining ?
4. What is the use of code segment ?
5. Define instruction pointer.
6. Define stack.

PART – B
(Short Essay)

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

7. Differentiate Maskable and Non-Maskable interrupts.
8. Explain the features of Microprocessors.
9. Explain the bus organization of 8085 microprocessor.
10. Explain any two control flags.
11. What is the use of segment register ?

P.T.O.

12. Explain the pin ALE.

13. Explain the instruction to transfer the address.

14. Explain any two loop instructions.

PART – C
(Essay)

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

15. What is the function of Execution Unit ?

16. Explain the features of 8257 DMA Controller.

17. Explain Interrupt vector table.

18. Explain conditional flags.

19. Explain bit manipulation instructions.

20. Explain DMA controller.

PART – D
(Long Essay)

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

21. Discuss various instruction sets in 8086 microprocessor.

22. Explain 8086 pin diagram.

23. Explain the architecture of 8085 microprocessor with diagram.

24. Explain Interrupts, types of interrupts and Interrupt Service Routines.

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III Semester B.C.A. Degree CBCSS (OBE) Regular/Supplementary/ Improvement – Examination, November 2021
(2019 – 2020 Admissions)
CORE COURSE
3B07BCA : JAVA PROGRAMMING

Time : 3 Hours Max. Marks : 40

PART – A

Short answer. Answer **all** questions. **(6×1=6)**

1. Define bytecode in Java.
2. What is Java class and Java method ?
3. Write note on interface.
4. What is the use of the keyword 'throw' ?
5. What is the advantage of Java applets ?
6. Expand AWT and JDK.

PART – B

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

7. Write note on Wrapper Classes.
8. Explain about constructors in Java.
9. Explain about method overriding with example.
10. Differentiate finally and finalize.
11. Explain about creating new packages in Java.
12. Explain about nested try statements with example.
13. Write note on html Applet tag.
14. Write short note on layout managers.

P.T.O.

PART – C

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

15. Define Array. Explain about array declaration and initialization with example.
16. Write a program to reverse the given string.
17. Explain about method overloading with example.
18. Write note on creating threads in Java.
19. Explain in detail about the life cycle of an applet.
20. Explain about creating and handling menus.

PART – D

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

21. Explain in detail about any five string handling methods with example.
22. Explain in detail about file input stream and file output stream.
23. Explain the keywords used in exception handling with example.
24. Explain in detail about any four AWT controls and their event handlers with example.

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III Semester B.Sc. Degree CBCSS (OBE) Reg./Sup./Imp. Examination, November 2021
(2019-2020 Admission)
Complementary Elective Course in Mathematics
3C03 MAT-BCA : MATHEMATICS FOR BCA – III

Time : 3 Hours Max. Marks : 40

PART – A

Answer **any four** questions. **Each** question carries **one** mark.

1. Is $y = -\frac{c}{x}$ (c an arbitrary constant) is a solution of the ODE $xy' = y$ for all $x \neq 0$?
2. Write characteristic roots of $y'' + 3y' + 2y = 0$.
3. Write the Laplace transform of te^{-2t}.
4. Find a_0 for the Fourier series of $f(x) = x^3$ defined on $[-1, 1]$.
5. What is the Euler formula for calculating b_n of Fourier series of function f(x) defined on $[-\pi, \pi]$?

PART – B

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

6. Solve $xy' = -y$.
7. Check whether the equation $\cos(x + y)dx + (y^2 + 2y + \cos(x + y))dy = 0$ exact or not ?
8. Solve $y' + y \tan x = \sin 2x$, $y(0) = 1$.
9. Solve $y' = Ay + By^2$.

P.T.O.

10. Find general solution to $y'' + y = 0$.

11. Solve $y'' + 4y' + 4y = 2e^{-t}$.

12. Find the Laplace transform of unit step function $u(t-a) = \begin{cases} 0 & \text{if } t < a \\ 1 & \text{if } t > a \end{cases}$.

13. Find the inverse Laplace transform of $\frac{3s-10}{s^2+2s+40}$.

14. Find the Fourier series of the function $f(x) = x^2$ if $-\pi < x < \pi$ and $f(x + 2\pi) = f(x)$.

15. Find Fourier series for the following function

    $f(x) = |x|, -\pi < x < \pi$

PART – C

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

16. Solve $(2 + 3x^2y^2)dx + 2x^3ydy = 0$.

17. Solve $(x^2 + y^2)dx - 2xydy = 0$.

18. Solve $y'' - y' - 6y = e^{3t} + 5$.

19. Solve $x^2y'' + xy' - y = 16x^3$.

20. Solve the initial value problem $y'' + 6y' + 8y = 0$, $y(0) = 1$ and $y'(0) = 1$ using Laplace transform.

21. Find the Fourier series of

$$f(t) = \begin{cases} 0 & \text{if } -\frac{\pi}{\omega} < t < 0 \\ E\sin\omega t & \text{if } 0 < x < \frac{\pi}{\omega} \end{cases}$$

22. Find Laplace transform of $f(t) = \cos 2t + \sin 2t$.

PART – D

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

23. Find the general solution to the initial value problem.

$(e^{(x+y)} + ye^{y})dx + (xe^{y} - 1)dy = 0; y(0) = -1.$

24. Solve :

a) $y'' + 4y' + 4y = e^{-x}\cos x.$

b) $y'' + 5y' + 6y = e^{-3x}.$

25. Write the following function using unit step functions and find its Laplace transform.

$$f(t) = \begin{cases} 2 & \text{if } 0 < t < 1 \\ \frac{1}{2}t^2 & \text{if } 1 < t < \frac{\pi}{2} \\ \cos t & \text{if } t > \frac{\pi}{2} \end{cases}$$

26. Find the Fourier series of

$$f(x) = \begin{cases} x & \text{if } -\pi < x < 0 \\ \pi - x & \text{if } 0 < x < \pi \end{cases}$$
