

B.C.A. – IIIrd sem

(Computer Based Numerical Methods)

Short Answer Type Questions

- 1) What are normalized floating point numbers?
- 2) What is truncation error?
- 3) What is round off error?
- 4) What is epsilon?
- 5) What are computational errors
- 6) What is error propagation
- 7) What are non-linear equations
- 8) Compare Gauss seidal and Gauss elimination methods?
- 9) What are methods of solution to linear equations
- 10) What are various iterative methods of solving non-linear equations?
- 11) Differentiate between interpolation and extrapolation
- 12) What is integration?
- 13) What are various integration formulas?
- 14) Write algorithm for trapezoidal method
- 15) Explain Runge-Kutta methods
- 16) Explain Degree of differential equation
- 17) Explain order of differential equation
- 18) What are differential equations?
- 19) Discuss significant digits with the help of suitable example.
- 20) Discuss about 1's and 2's complement with the help of suitable examples
- 21) How to represent integers in memory? Give suitable examples.
- 22) Discuss about error propagation in arithmetic operations
- 23) Discuss Normalization and its consequences.
- 24) What is pivoting? Give example.
- 25) Give examples of exact number and approximate number.

Long Answer Type Questions:-

- 1) Advantages of normalized floating point number over fixed point number representation
- 2) Discuss concept of 0 in floating point numbers.
- 3) Explain underflow and overflow
- 4) Discuss various types of errors.
- 5) Let $x=0.00005998$. Find relative error if x is rounded off to 3 decimal places
- 6) Let $x=0.0045678$. Find absolute error if x is rounded off to 4 decimal places
- 7) What do you mean by approximate numbers and significant digits?
- 8) Solve $f(x)=x^2-16$ using bisection method
- 9) Solve $x^3-4x-9=0$ using false position method
- 10) Find real root of equation x^3-x-1 using iteration method.
- 11) Discuss Birge-Vieta method of finding zeros of a polynomial
- 12) Find root of equation $3x^3-9x^2+8$ using Newton-Raphson Method
- 13) Solve using Gauss Elimination method
 - $3x_1+6x_2+x_3=16$
 - $2x_1+4x_2+3x_3=13$

$$X_1 + 3x_2 + 2x_3 = 9$$

14) Solve using Gauss Jordan Method

$$3x_1 + 6x_2 + x_3 = 16$$

$$2x_1 + 4x_2 + 3x_3 = 13$$

$$X_1 + 3x_2 + 2x_3 = 9$$

15) Differentiate between Direct Methods and Iterative methods of solving non-linear equations

16) Discuss pivoting

17) What is interpolation? Give example

18) State and prove Newton's forward difference interpolation method

19) Using Newton's formula find $f(1.6)$

X:	1	1.4	1.8	2.2
F(x):	3.49	4.82	5.96	6.5

20) Write an algorithm for Newton's backward interpolation method

21) Extrapolate when $x=50$

X:	10	20	30	40
Y:	10	40	90	160

22) Explain Newton's Divided difference interpolation method

23) Explain with example Lagrange's method of interpolation

24) **Given** $dy/dx = x^2 + y$ with $y(0) = 0.94$. Find $y(0.1)$ and $y(0.2)$ using Euler's method

25) Given $dy/dx = 1 + xy$ with $y(0) = 2$. Find $y(0.1), y(0.2)$ by using Runge-Kutta method

26) Explain with example Taylor's series.

27) Explain Approximation and its methods.

28) How to solve a non-linear equation using Newton Raphson method? Discuss analytical and geometric derivation of the method.

29) Discuss the convergence of false position method.

30) Derive Simpson's 1/3 rule.

31) Derive Newton's backward difference interpolation formula.

32) How to approximate a function using Taylor Series representation.

B.C.A. – 3rd Sem

(Data Structure)

1. List out the areas in which data structures are applied extensively?
2. What are the major data structures used in the following areas : RDBMS, Network data model & Hierarchical data model. ?
3. If you are using C language to implement the heterogeneous linked list, what pointer type will you use?
4. Minimum number of queues needed to implement the priority queue?
5. What is the data structures used to perform recursion?
6. What are the notations used in Evaluation of Arithmetic Expressions using prefix and postfix forms?
7. What are the methods available in storing sequential files?
8. List out few of the Application of tree data structure?
9. Traverse any tree using In order, Preorder and Post order traversals.
10. Sort the given values using Quick Sort? 65 70 75 80 85 60 55 50 45
11. . What is a spanning Tree?
12. Whether Linked List is linear or Non-linear data structure?
13. Draw a binary Tree for the expression : $A * B - (C + D) * (P / Q)$
14. What is the difference between a queue and a stack?
15. Translate infix expression into its equivalent post fix expression: $(A-B)*(D/E)$
16. .Translate infix expression into its equivalent post fix expression: $A*(B+D)/E-F*(G+H/K)$
17. Write an algorithm to traverse a linked list.
18. List out few of the Application of tree data structure?
19. What are priority queues?
20. What are the limitations of arrays?
21. What is the difference between an array and a linked list?
22. What is a linked list?
23. What is a node?
24. What is sorting?
25. List some popular sorting methods.
26. Explain bubble sort.
27. What is the complexity of bubble sort?
28. Explain the procedure for insertion sort.
29. What is insertion sort?
30. Sort 20,35,40,100,3,10,15 using insertion sort.
31. What is the complexity of insertion sort?
32. What is merge sort?
33. What is selection sort?
34. Write the process of selection sort.
35. What is the complexity of insertion sort?
36. Write Selection Sort Algorithm
37. Name some operations on Linked Lists
38. Explain circularly linked lists
39. What is a binary tree?
40. What is quicksort algorithm?

41. . Program to add a new node to the ascending order linked list.
42. What are complete trees?
43. Big Oh Notation
44. Complexity of an algorithm
45. Applications of Data structure
46. Types of Data Structure
47. Searching and its types.
48. Comparison between linear and Binary search
49. Explain Linear Search
50. Explain Binary search

Information Systems Design and implementation

BCA 3rd sem

- 1. What is Data?**
- 2. What is Information?**
- 3. What is System? Explain its various types.**
- 4. Difference between Open and Closed systems.**
- 5. What is Information system? Explain various types of information systems.**
- 6. What are various elements of systems?**
- 7. What are merits and demerits of distributed systems?**
- 8. What is man made system?**
- 9. Explain SDLC.**
- 10. What do you mean by feasibility study?**
- 11. What is feasibility report?**
- 12. What is system Investigation?**
- 13. What is implementation**
- 14. Explain Seven types of feasibility study?**
- 15. Explain various types of testing.**
- 16. What is Test plan?**
- 17. Who is system Analyst?**
- 18. What are Data Analysis tools?**
- 19. Difference between DFD and Flowchart?**
- 20. What are decision tables?**
- 21. Similarities between decision tree and DFD.**
- 22. Difference between Validation and verification.**
- 23. What is system product?**
- 24. What are System process model?**
- 25. How RAD model works?**
- 26. Explain various information gathering techniques.**
- 27. What is the role of System Analyst?**
- 28. Explain various kinds of information required to develop a system.**
- 29. What are primary steps in interview?**
- 30. Difference between Structured and unstructured interview.**
- 31. How a structured chart is developed?**
- 32. What is System Design?**
- 33. Difference between Logical and Physical design.**
- 34. What is DFD ? Explain with Example.**

35. What is 3rd Phase of SDLC is called?
36. Explain advantages of top down approach.
37. What is the use of bottom up approach?
38. What is coupling and Cohesion?
39. Explain Various types of Coupling.
40. Explain various types of Cohesion.
41. What are various types of Errors?
42. Explain various types of testing.
43. What is system project management?
44. Explain various types of maintenance.
45. What steps should be followed to select a software?
46. What is the criteria for hardware selection?
47. What is quality assurance?
48. Explain various steps of system installation.
49. What is Cost management while developing a system?
50. What is vendor selection?