Question Bank

B. Tech. (Computer Science)

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BT102	Introduction to Computers Fundamental and IT*
CS 201	Object Oriented Programming
CS301	Data Structures and Algorithms
CS302	Core Java
CS303	Data Base Management System
CS306	Telecom Engineering Fundamentals
CS402	Web Based Applications and Development
CS404	Software Engineering
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CS406	Theory of Computation
CS501	Java 2 Enterprise Edition
CS502	Computer Network
CS503	Advanced Software Egg.
CS505	Design and Analysis of Algorithms
CS506	Computer Organization and Architecture
CS601	Advanced Computer Architecture
CS602	Operating Systems and Unix Administration
CS603	System Software Engineering
CS604	Information Theory and Coding
CS605	Advanced Data structure
CS606	Multimedia System
CS701	C# and .NET Programming
CS702	Artificial Intelligence
CS704	Simulation and Modeling
CS705	Visual Programming
CS706	Compiler Construction

Introduction to Computers Fundamental and IT (BT102)

UNIT – 1

1. Define Computer? Also explain the various features of computer system.
2. Explain in detail the history of computer; also explain the evolution process of it.
3. Draw a block diagram of basic components of a computer system. Explain each component in detail.
4. What is role of input devices? Write down any three input devices with their full description.
5. What is role of output devices? Write down any three output devices with their full description.
6. What are the various characteristics of computer system?
7. Write down the limitations of computer system.
8. What are the various types of computer system?
9. Explain memory hierarchy in detail.
10. What do you understand by secondary storage?
11. What do you understand by cache memory? Also explain the role of cache in computer system.

UNIT – 2

12. What are the internal and external commands?
13. Explain Overview of architecture of windows.
14. Explain Overview of Linux architecture.
15. Define the Windows 2000 and NT.
16. What are System Tools and Utilities?
17. What are the steps of rpm and deb based packages.
18. What do you understand by Operating system? Also explain the features of Operating system.
19. Define Open Source Technology in detail. Also explain their advantages.

UNIT – 3

20. What do you understand by Positional and non-positional numbers? Explain with suitable example.
21. Explain the characteristics of following number systems?

    a) Decimal Number System
    b) Octal Number System
    c) Hexadecimal Number System
    d) Binary Number System

22. What do you understand by EBCDIC and ASCII Codes of computer systems? Explain with suitable example.
23. Explain 1,s and 2,s complement representation.

24. Convert the following Numbers.

        a) $(10101)_2 = (\text{ ? })_{10}$
        b) $(1110001)_2 = (\text{ ? })_{10}$
        c) $(62)_8 = (\text{ ? })_{10}$
        d) $(2085)_8 = (\text{ ? })_{10}$
        e) $(1CE)_{16} = (\text{ ? })_{10}$
        f) $(2AF)_{16} = (\text{ ? })_{10}$

25. Convert the following Number System.

        a) $(85)_{10} = (\text{ ? })_2$
        b) $(954)_{10} = (\text{ ? })_2$
        c) $(624)_{10} = (\text{ ? })_8$
        d) $(257)_{10} = (\text{ ? })_8$
        e) $(351)_{10} = (\text{ ? })_{16}$
        f) $(6812)_{16} = (\text{ ? })_{16}$

26. Convert the following Number System.

        a) $(534)_8 = (\text{ ? })_{16}$
        b) $(101011)_2 = (\text{ ? })_8$
        c) $(624)_8 = (\text{ ? })_2$
        d) $(11101)_2 = (\text{ ? })_8$
        e) $(3B1)_{16} = (\text{ ? })_2$
        f) $(AC2)_{16} = (\text{ ? })_8$

27. Convert the following Number System.

        a) $(110.111)_2 = (\text{ ? })_{10}$
        b) $(10.011)_2 = (\text{ ? })_{10}$
        c) $(12.5)_8 = (\text{ ? })_{10}$
        d) $(49)_8 = (\text{ ? })_{10}$

28. Perform the followings:

        a) $(110111)_2 + (111001)_2 = (\text{ ? })_2$
        b) $(11101)_2 + (110)_2 = (\text{ ? })_2$
        c) $(101101)_2 + (1001)_2 = (\text{ ? })_2$
        d) $(1011)_2 + (100011)_2 = (\text{ ? })_2$

29. Find the complement of the followings:

       a) $(56)_{10}$
       b) $(64)_8$
       c) $(1011010)_2$

30. Perform the following by complement method:

       a) $(96)_{10}$ - $(79)_{10}$
       b) $(46)_{10}$ - $(169)_{10}$
       c) $(111)_2$ - $(10)_2$
       d) $(1110)_2$ - $(10010)_2$
       e) $(59)_8$ - $(14)_8$

UNIT – 4

31. What do you understand by Computer Network?
32. Explain common types of Networks.
33. What is LAN, PAN, WAN and MAN?
34. Explain Network Topologies.
35. Explain Computer Protocols.
36. Differentiate between Star, Bus and MESH Topologies.
37. Explain Data base Management System.
38. What are the advantage and disadvantage of DBMS?
39. What is Network Media?
40. Explain advantage and disadvantage of Tree, Ring and Hybrid Topologies.

UNIT – 5

41. Explain MS Office, MS Power Point and MS Excel.
42. Introduction to Electronic Spread sheet.
43. What are the Applications of Electronic Spread Sheets?
44. Explain Types of Spreadsheet.
45. What are the features of MS Excel?
46. Define the MS Power Point and its Features.
47. What is Presentations?
48. What are the contents of MS-Excel?
49. What are the MS Office Packages?
50. Define Cell referencing, Ranges and Functions in MS Excel.

Object oriented Programming (CS 201)

UNIT-1
Q.1   What are the features of Object Oriented Programming?
Q.2   Distinguish between Procedure Oriented Programming and Object Oriented
           Programming.
Q.3   Define Object Oriented Programming (OOP) and List out the basic concepts of
           Object Oriented Programming.
Q.4   What is the return type of main ()?
Q.5   Define token. What are the tokens used in C++?
Q.6   Define the 2 memory management operators and List out the memory differencing
           operator.
Q.7   Define manipulators. What are the manipulators used in C++?
Q.8   What are the Merits and Demerits of Object Oriented Methodology.
Q.9   Define manipulators. What are the manipulators used in C++?
Q.10   Explain the features of object oriented programming with example.

UNIT-2
Q.1   What are the difference between reference variables and normal variables?
Q.2   Explain about call-by-reference and return by reference.

Q.3   What is function overloading? Explain with an example program.
Q.4   What is friend function? What is the use of using friend functions in c++? Explain
           with a Program.
Q.5   What are the advantages of using default arguments? Explain with an example
           program.
Q.6   Explain copy constructor and destructor with suitable C++ coding.
Q.7   What is a virtual destructor? Explain the use of it.
Q.8   Define an examiner class. Provide all necessary data and function members to
           provide the following: The examiner must access answer sheets of at least one
           subject; He may examine answer sheets of multiple subjects; The examiner
           represents a college and also a university; Most of the examiners are local and
           represent local university; and have more than one constructor including one default
           and one with default argument. Provide a meaningful copy constructor
Q.9   Write a program to demonstrate how a static data is accessed by a static member
           function.
Q.10   Write a program to get the student details and print the same using pointers to objects
           and pointers to members of a class. Create a class student. And use appropriate
           functions and
           data members.

UNIT-3
Q.1   Explain about Unary Operator and Binary Operator Overloading with program.
Q.2   List out the rules for overloading operators with example.
Q.3   How will you overload Unary & Binary operator using member functions?
Q.4   How will you overload Unary and Binary operator using Friend functions?
Q.5   How an overloaded operator can be invoked using member functions?
Q.6   What is meant by casting operator and write the general form of overloaded

casting operator?

What is the Difference between Overriding vs. overloading.

Q.8   For a supermarket, define a bill class. All the bill objects will contain bill number, name of clerk preparing the bill, each item with quantity and price and total amount to be paid. Total items in the bill are varying. Define dynamic memory allocation constructor for bill class such that any number of items from 1 to 50 can be accommodated in a single bill. There is an array describing each item with a price. The price is to be picked up from that array. Now overload = operator and provide reason for the need of such operator.

Q.9   Write a program to create prime number using operator overloading.

Q.10   Write a program to explain inheritance using example.

UNIT-4

Q.1   What are the virtual functions? Explain their needs using a suitable example. What are the rules associated with virtual functions?

Q.2   What are the different forms of inheritance supported in c++? Discuss on the visibility of base class members in privately and publicly inherited classes.

Q.3   Discuss about Streams and stream classes.

Q.4   Write notes on Formatted and Unformatted Console I/O Operations.

Q.5   Explain about File Pointers and Manipulations with example.

Q.6   Write notes on Formatted and Unformatted Console I/O Operations.

Q.7   Explain about File Pointers and their manipulations with example.

Q.8   What is the differences between Manipulators and ios Functions.

Q.9   Define a student class. Inherit that into MCA Student class and Non MCA Student. MCA Students inherits into GLSSTudents and Non GLS Students. A function Show Practical Hours can only be applied to MCA Students. We have a base class Student pointer to a GLS Student object. Use dynamic_cast ti check that Non MCA Students do not Show Practical Hours.

Q.10   Write a program to create virtual functions.

UNIT-5

Q.1   What is Generic programming? Describe it.

Q.2   What is Template? Explain the types of template as you know.

Q.3   What is Exception? Explain the types of Exception handling technique in C++.

Q.4   What is the difference between Exception & Error? Describe it.

Q.5   What are the container classes? Explain the concept of STL in generic Programming.

Q.6   What is Runtime type casting? Explain it with suitable example.

Q.7   Write a C++ program to handle exception using **try () catch ()** block.

Q.8   What is Namespace? Write a sample C++ program using namespaces.

Q.9   Write a program of function template in C++.

Q.10   Write a program of Class template in C++.

Subject: DSA (CS301/EE306/EC304)

UNIT – 1

1. Explain type of data structure and operations which are performed on data structure.

2. What is array. Explain the row major and column major representation of arrays. Give address calculation formula for each with example.

3. What is data structure?

4. List out the areas in which data structures are applied extensively?

5. Explain the Types of Link list?

6. What is the data structures used to perform recursion?

7. What do you understand by Sparse matrix?

8. How the Algorithms play important role in Data Structure.

9. Explain the complexity and the Asymptotic Notation of

Algorithms?

10. Explain the singly and doubly link list.

UNIT – 2

11 Write Algorithms for conversion of infix expression into postfix conversion.

12. convert the following expression into postfix

A*(B+D)/E-F*(G+H/K)

13. Evaluate the following expression which is in postfix

12, 7, 3,-, /, 2, 1, 5, + , *, +

14. Explain the stack with its operations?

15. Describe the Priority queue with example?

16.Explain the Tower of Hanoi problem with algorithms.

17. What are the notations used in Evaluation of Arithmetic Expressions using prefix and postfix forms?

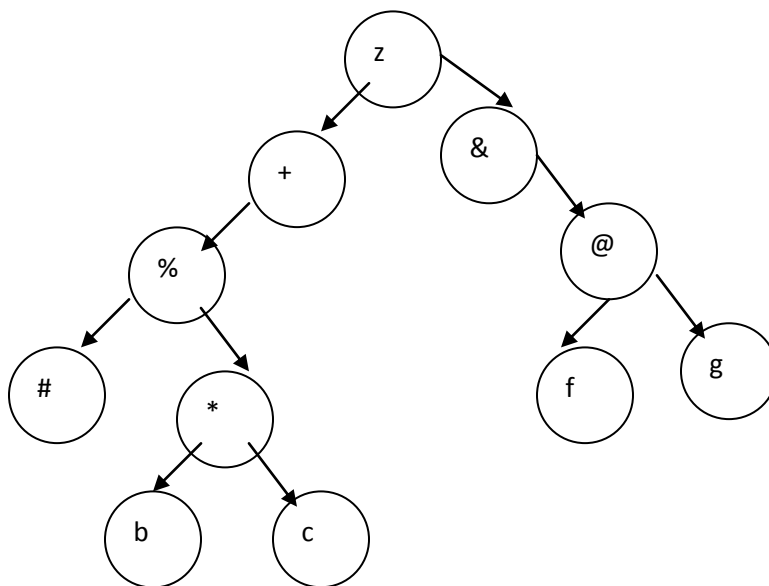18.Convert the expression ((A + B) * C – (D – E) ^ (F + G)) to equivalent Prefix and Postfix notations.

19. What do you understand by deque?

20. Explain push () and pop() operations.

UNIT – 3

21.Define the complete binary tree.

22. find the preorder, post order and in order of the following binary tree

23. Write a algorithm for preorder traversal in binary tree.

24. Explain the Binary search tree .

25. write a algorithm for find the location of a given item in BST.

26. Differentiate the B tree and B+ tree

27. There are 8, 15, 13, 14 nodes were there in 4 different trees. Which of them could have formed a full binary tree?

28. In the given binary tree, using array you can store the node 4 at which location?

29. Explain the multi way trees?

30. What do you understand AVL tree ?

UNIT – 4

31.Explain the BFS(breadth first search)with example.

32.Explain the DFS(deapth first search)with example.

33. Explain the minimum spanning tree.

34. write the Prims algo for minimum spanning tree.

35. write the krushkal algo for minimum spanning tree.

36. Explain the shortest path algorithms.

37. Explain the Adjacency matrix with example.

38. Explain the Adjacency list with example.

39. Explain single source path problem with example.

40. Explain multi source path problem.

UNIT – 5

41. Explain the bubble short with algorithms.

42. Explain the Quick sort with algorithms.

43. Explain the bucket sort with algorithms.

44.Explain the insertion sort with algorithms.

45. Explain selection sort with algorithms.

46. Explain hasing and symbol table.

47.What do you understand by merging?

48.Explain the Radix sort with algorithms.

49. Explain the string search method?

50. Write an algorithm for binary search?

Subject: Core Java (CS302/IT302)

Unit-I

1. **Explain the** characteristics & features of java language.

2. **Explain main( ) method in java. What is java's magic byte code? Explain in detail.**

3. **Answer the following:**

   a. **With the base of Unicode, Java platform has become better. Explain how?**

   b. **Describe all the primitive data types supported by Java with appropriate examples. Also specify their storage capacity/range.**

4. **What are lexical issues & continue revolution in java?**

5. **What are java buzz words? Give brief description.**

6. **What do you understand by type casting & automatic promotion**? Explain with suitable examples.

7. **What are the different components of JDK? Explain. Also describe the concept of JRE.**

8. **Illustrate the difference between java & C++. W**hy is Java language important in relevance to the Internet?

9. **Is java pure Object Oriented Language? Explain. Also explain the advantages & disadvantages of java.**

10. **Explain the concepts JDK, JRE and JVM.**

Unit-2

1. **What is the purpose of the System class? Also explain the wrapper class in detail.**

2. **Write a program to find a number provided by the user in a given array using binary search?**

3. **What is constructor chaining & why do we need it? Give an example.**

4. **Write a program to input any three numbers from the console & find out the maximum number.**

5. Integer i = new Integer (42);
   Long 1 = new Long (42);

Double d = new Double (42.0);

Which two expressions evaluate to be True? (Choose Two)

A. (i ==1)

B. (i == d)

C. (d == 1)

D. (i.equals (d))

E. (d.equals (i))

F. (i.equals (42))

6. The following program has several errors. Modify it so that it will compile and run without errors.

```
// Filename: Temperature.java
PUBLIC CLASS temperature {
  PUBLIC void main(string args) {
     double fahrenheit = 62.5;
     */ Convert /*
     double celsius = f2c(fahrenheit);
     System.out.println(fahrenheit + 'F = ' + celsius + 'C');
  }

  double f2c(float fahr) {
     RETURN (fahr - 32) * 5 / 9;
  }
}
```

7. **What is the difference between the >> and >>> operators? Explain with the help of a program?**

8. **What is the difference between a field variable and a local variable?**

9. **What classes of exceptions may be thrown by a throw statement?**

10. **Explain all Checked & Unchecked Exceptions.**

Unit-3

1. **How many times may an object's finalize() method be invoked by the garbage collector?**

2. **What is interface & when do we use it?**

3. **What is reachable & non reachable code? Can an object be garbage collected while it is still reachable?**

4. **What is name clashing? Explain the concept.**

5. **What is the difference between a static and a non-static inner class?**

6. **Write short notes on the following**

   a) **this & super keyword**
   b) **final & static keyword**
   c) **nested & inner classes & their uses.**
   d) **class & object .**

7. **Which of the following methods are defined in the Object class? Also give an example of the selected method.**

   a) **toString( )**
   b) **equals(Object o)**
   c) **wait( )**
   d) **all of the above**

8. **What is the correct ordering for the import, class and package declarations when found in a Java class?**

   a) **package, import, class**
   b) **class, import, package**
   c) **import, package, class**
   d) **package, class, import**

9. Describe Dynamic method dispatch concept. Also give the difference between Abstract class & interface.

10. What are JAR files & how can you create them? Where do we use them?

11. What is the difference between an array and a vector?

Unit-4

1. **What are the high-level thread states?**

2. **What is the purpose of the wait(), notify(), and notifyAll() methods?**

3. You want subclasses in any package to have access to members of a superclass. Which is the most restrictive access modifier that will accomplish this objective? Explain with example.

4. You need to store elements in a collection that guarantees that no duplicates are stored and all elementscan be accessed in natural order. Which interface among the following provides this capability? Also give two examples for the selected interface.
   a) Java.util.Map.
   b) Java.util.Set.
   c) Java.util.List.
   d) Java.util.StoredSet.
   e) Java.util.StoredMap.
   f) Java.util.Collection.

5. **What is the difference between yielding and sleeping?**

6. **What restrictions are placed on the location of a package statement within a source code file?**

7. Write a program to implement LIFO (last in first out) with the use of all the methods .

8. What will be the result of attempting to compile and run the following program?

```
public class MyClass extends Thread {
   public MyClass(String s) { msg = s; }
   String msg;
   public void run() {
      System.out.println(msg);
   }

   public static void main(String[] args) {
      new MyClass("Hello");
      new MyClass("World");
   }
}
```

Select the one correct answer.

a. The program will fail to compile.
b. The program will compile without errors and will print Hello and World, in that order, every time the program is run.
c. The program will compile without errors and will print a never-ending stream of Hello and World.
d. The program will compile without errors and will print Hello and World when run, but the order is unpredictable.

9. Create different versions of a program that finds all the primes below 100?

10. Which of these field declarations are legal within the body of an interface?

Select the three correct answers.

  a. public static int answer = 42;
  b. int answer;
  c. final static int answer = 42;
  d. public int answer = 42;
  e. private final static int answer = 42;

Unit-5

1. **What is the purpose of the File class?**

2. **Explain all the methods of String class with examples.**

3. **Read the following code:**

Given:

1 public class Foo {

2 public static void main (String [] args) {

3 StringBuffer a = new StringBuffer ("A");

4 StringBuffer b = new StringBuffer ("B");

5 operate (a,b);

6 system.out.printIn{a + "," +b};

7)

8 static void operate (StringBuffer x, StringBuffer y) {

9 x.append {y};

10 y = x;

11)

12 }

What is the result?

A. The code compiles and prints "A,B".

B. The code compiles and prints "A,A".

C. The code compiles and prints "B,B".

D. The code compiles and prints "AB,B".

E. The code compiles and prints "AB,AB".

F. The code does not compile because "+" cannot be overloaded for StringBuffer.

4. **Explain the transient & volatile variable & native method?**

5. **When a thread blocks on I/O, what state does it enter?**

6. **What is the difference between the String, Stream and StringBuffer classes?**

7. Which statement is true? Select the one correct answer.

   a. new and delete are keywords in the Java language.
   b. try, catch, and thrown are keywords in the Java language.
   c. static, unsigned, and long are keywords in the Java language.
   d. exit, class, and while are keywords in the Java language.
   e. return, goto, and default are keywords in the Java language.
   f. for, while, and next are keywords in the Java language.

8. What is use of synchronized keyword & serialization?

9. Explain the concept of default package, & anonymous class & anonymous Array ?

10. What is mean by multi-threading ? What are the 2 ways of creating a thread ? Which is the best way and why?

Database Management System (CS303/ME303/EE406)

UNIT – 1

1. What is DBMS? What are the advantages and disadvantages offered by data base management system?
2. What are the various functional components of a database system? Describe the architecture of data base management system.
3. Discuss the main characteristics of the database approach and how it is differs from file processing system?
4. Discuss the responsibilities of DBA. Explain the three level Architecture of DBMS.
5. What is meant by Data Independence? Explain the types of Data Independence with the help of an example.
6. What do you understand by Data Abstraction? Explain the different levels of Data Abstraction.
7. What is storage manager? Explain the components of storage manager and define the purpose of storage manager?
8. Describe each of the components of a DBMS

   (a) Data Dictionary (b) Data Security and Integrity (c) Concurrent data Access for Multiple Users

9. Describe the followings:

   (a) Data Abstraction.

   (b) Applications of DBMS.

   (c) Data Independence

   (d) Storage Manager

   (e) Transaction Management

10. Write short notes on:

    (a) Physical schema   (b) Logical schema.   (c) Transaction Management

    (d) Data Base Administrator

UNIT – 2

1. What is an Entity Relationship diagram, describe its components using suitable example.

2. Describe the Candidate Key, Primary Key and super key? How Primary Key is different from foreign key.

3. Construct an ER-diagram for hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.

4. Explain the following terms in respect to E-R diagram with suitable examples:-

(a) Entity and Attributes

(b) Generalization and Specialization

(c) Relationship and Relationship sets

(d) Key Constriants

5. Draw an E-R diagram for a Banking enterprise and University management

6. Draw an E-R diagram for Airline Schema

7. Draw an E-R diagram for Library Management System

8. Draw an E-R Diagram for ATM, Hospital and Insurance Company.

9. (a) What are weak and strong entities? How are they represented in E-R diagram?

    (b) What is an Attribute? Explain different types of attributes.

    (c) Define Cardinality Mapping?

10. (a) Explain the importance of Aggregation over Ternary Relationship.

(b) Create an E-R Model

Consider the following tables:

Employee (Emp_no, Name, Emp_city, Emp Address)

Company (Emp_no, Company_name, Salary, department)

UNIT – 3

1. What is Relational algebra? Explain various relational algebra operators with suitable example.

2. (a) What is a JOIN Operation? How 'Natural –Join' operation is performed?

   (b) How many types of Join Operation? Describe the benefits of joins?

3. Differentiate between Cartesian product and natural join operations used in relational algebra.

4. What is relational calculus? Describe the Domain and Tuple calculus.

5. Describe the SELECT and PROJECT operation using example in relational algebra.

6. Describe the UNION and INTERSECTION Operation using suitable example.

7. Describe the Circumstances when you would use each of the following relational Algebra

Operations

a) SELECT

b) PROJECT

c) JOIN

d) DIVISION

8. Write short notes on followings

(a) RENAME operator

(b) SET-DIFFERENCE

(C) CARTESIAN- PRODUCT

9. (a) What is meant by a unary and binary operation? What are they?

   (b) Define the equijoin and non equijoin?

10. Define Relational model and relation Algebra. Define the basic operations of Relational algebra.

UNIT – 4

1. Define the Structured Query Language. Give the classification of the query language.

2. What are aggregate functions? Describe the aggregate functions supported by SQL.

3. With relevant examples discuss the following in SQL.

(a) Data Definition Language.   (b) Data Manipulation Language

(c) Data Control Language

4. Define the following in context of SQL

(a) DISTINCT clause (b) GROUP BY Clause (c) ORDER BY clause   (d) WHERE clause

5. What is meant by the term Query Processing? What are the various steps involved in this

Process ?

6. What is structured query language? How the DDL and DML are different? Explain.

7. Consider the employee database, where the primary keys are underlined.

Employee (empname , street, city)

Works (empname, companyname, salary) Company (companyname, city)

Manages (empname, managername)

(a) Find the names of all the employees who work for First Bank Corporation.

(b) Find the names, street addresses, and cities of residence of all employees who work for First Bank Corporation and earn more than 300000 per annum.

(c) Find the names of all employees in this database who live in the same city as the companies for which they work.

(d) Find the names of all the employees who earn more than every employees of Small Bank Corporation.

8. Consider the relational table given below and answer the following SQL queries.

Employee (SSN-No, Name, Department, Salary)

(a) List all the employees whose name starts with the letter 'L'.

(b) Find the maximum salary given to employees in each department.

(c) Find the number of employees working in 'accounts' department.

(d) Find the second maximum salary from the table.

(e) Find the employee who is getting the minimum salary.

9. Describe the Triggers and Active Database in Structured Query Language

10. Explain the following Aggregate functions in SQL

    (a) Average: avg
    (b) Minimum: min
    (c) Maximum: max
    (d) Total: sum
    (e) Count: count

UNIT – 5

1. What is Normalization? Explain the various normalization techniques with suitable example.
2. Justify the need for normalization with examples. Describe the comparison between BCNF and 3 NF in normalization.
3. What do you understand by backup and recovery? How you can recover data from catastrophic failures?
4. What are ACID properties? Explain the ACID properties of a transaction management

5. Define the Normalization? Explain 1NF, 2NF, 3NF and BCNF with simple example.

6. What are the concurrency control schemes? What happened when a Deadlock occurs?

7. Define the locking techniques for concurrency control. Distinguish between Shared and Exclusive locks.

8. Define two phase locking and distinguish between static, dynamic locking and strict two phase locking.

9. What do you understand by Normalization? Explain normalization techniques using functional dependencies with example.

10. What is deadlock? Explain the techniques to control deadlocks.

Telecom Engineering Fundamentals (CS306)

UNIT – 1

1. Explain TCP/IP protocol Architecture in detail.
2. Explain Broadband and narrowband ISDN Protocols
3. Difference between LAN, MAN and WAN.
4. Explain electromagnetic spectrum of telecommunication
5. Explain government and military applications in detail.
6. Information Explosion in industry
7. Explain ISDN protocol architecture.
8. Describe the estimated bandwidth need of telecommunication
9. Difference between TCP/IP protocol and OSI model Architecture.
10. **What are the Telecommunication need and applications?**

UNIT – 2

1. Describe all Transmission impairments in detail.
2. Differentiate between Twisted pair and Optical fiber.
3. Explain wireless microwave and satellite transmission.
4. What is the position of the transmission media in OSI or the Internet model?
5. Time domain and frequency domain analysis
6. Guided transmission media
7. Frequency spectrum and bandwidth.
8. What is the purpose of cladding in optical fiber?
9. What are the two major categories of transmission media?
10. Calculate the bandwidth of the light for the following wavelength ranges(assume a propagation speed of $2* 10^8$)
    a. 1000 to 1200 nm
    b. 1000 to 1400 nm

UNIT – 3

1. Define scrambling and its purpose.
2. Compare and contrast PCM and DM.
3. Draw the waveform for 11001110 in each of the following encoding methods:
   a) NRZ-Z   b) NRZ-L   c)RZ   d)Manchester e)Differential Manchester
4. An analog signal has a bandwidth of 40KHz.If we sample this signal and send it through a 50Kbps channel what is the $SNRd_B$?
5. Define carrier signal and its role in analog transmission.
6. Delta Modulations
7. ASK, FSK and PSK techniques
8. Pulse code and pulse Amplitude Modulations
9. phase modulation techniques.
10. Calculate the baud rate for the given bit rate and type of modulation.

a. 4000 bps, FSK
b. 6000 bps, ASK
c. 8000 bps, QPSK
d. 72,000 bps, 64-QAM.

UNIT – 4

1. Distinguish between multilevel TDM, multiple slot TDM, and pulse- stuffed TDM.
2. Describe the goal of multiplexing.
3. Distinguish between synchronous and statistical TDM.
4. We need to transmit 150 digitized voice channels using a pass- band channel of 20 kHz. What should be the ratio of bits/Hz
5. Explain Fixed, flopping and adaptive routing strategies
6. Describe X.25 interface packet format.
7. Explain X.28 protocol in detail.
8. Describe Packet Switching principles
9. Distinguish between space and time division switching.
10. Assume that a voice channel occupies a bandwidth of 4 kHz. We need to multiplex 12 voice channels with guard bands of 500Hz using FDM. Calculate the required bandwidth.

UNIT – 5

1. Distinguish between pure and slotted ALOHA protocols.
2. Explain persisted and Non-persisted CSMA.
3. Describe Collision free protocols.
4. Explain Digital cellular radio
5. What is CDMA? Explain.
6. Explain Frame Relay protocol Architecture
7. Describe Frame Relay Call control.
8. What is congestion control?
9. Explain Channel allocation problem.
10. Explain MAC sub layer.

Subject: Web Based Applications and Development (CS402)

UNIT – 1

51. What do you understand by Servers and their parts?
52. Explain client and server architecture in detail.
53. What do you understand by DNS (Domain Name Server)?
54. Write Short Notes On Following:
    a) Dial Up
    b) ADSL
    c) Leased Lines

55. Write Short Notes On Following:
    a) Web TV
    b) Intranet

56. What do you understand by ISP? Also explain the features of ISP.
57. Compare Intranet and LAN in detail.
58. What do you understand by topologies? List various type along their features.
59. Write down the basic steps to connect to an internet.
60. Compare various topologies in detail.

UNIT – 2

61. Write Short Notes on basic Email handling.
62. Write Short Notes on Email Filters.
63. What do you understand by address book? List their advantages.
64. Write Short Notes on Video Conferencing.
65. What are the software and hardware requirements of video conferencing.
66. What do you understand by ISDN?
67. Explain multipoint conferencing in detail.
68. Write short note on Email Forwarding.
69. Compare voice and video conferencing in detail.
70. What do you understand by Voice Conference? Explain with any suitable example.

UNIT – 3

71. What are the basic elements of web server languages?
72. What do you understand by web resources?

73. What do you understand by Search Engines?
74. Write short note on web page and websites.
75. What do you understand by message boards?
76. Write short note on News Groups.
77. Write short note on Chat.
78. What do you understand by navigation in contrast to web sites?
79. Write short note on Themes of web pages.
80. How a web site can be published. Explain in detail.

UNIT – 4

81. What do you understand by HTML? List their limitations
82. Create a web page illustrating text formatting tags.
83. Create a web page to demonstrate font variations.
84. What is the role of list in web page creation?
85. Prepare a sample code to illustrate three types of lists in HTML.
86. What is the code in HTML so that someone can mail by just clicking on text?
87. Write a code for create a multiple list in HTML.
88. Divide the web page in 2 rows and 3 columns using frame set.
89. Explain hyper link example with target attribute as follows.

90. Create a html page for the following format.

Table With Mobile Connections

91. What do you understand by XML. List the advantages of XML in detail.
92. Using CSS invert the behavior of the <h1> to <h6> tags.
93. Create a sample code to illustrate the Inline style sheet for your web page.
94. Create a sample code to illustrate the External style sheet for your web page.
95. Create a sample code to illustrate the embedded style sheet for your web page.
96. Create a sample code to illustrate the procedure of creating user defined classes in CSS.

UNIT – 5

97. Compare java and java script in detail.
98. Create a java script program to accept the first, middle, last names of user and print them.
99. Evaluate the following using java script :
   a. "10 "+ " 20"

   b. (10<8)?10:8

100.   Write a java script program to add two numbers.
101.   Write a java script program to find the factorial of given number.
102.   Write a java Script program to print all prime numbers.
103.   Write a java script program to sort the array (Bubble Sort).
104.   Write a java script program to evaluate the following mathematical Expression 1+2/2!+3/3!+…………+n/n!.
105.   Write a java script program to "Wish a user " at different hours of a day.
106.   Prompt a user for the cost price and selling price of an article and output the profit and loss percentage.
107.   How to use a hidden field in java script.
108.   What do you understand by Cookies?

Software Engineering (CS 404)

UNIT – 1

1. What is software engineering, what do you understand by the term "software"? Discuss its characteristics and components?

2. Discuss the software process and product metrics with the help of examples and explain the SDLC.

3. i) Discuss in detail FAST method of requirement with an illustration.
   ii) What are the characteristics and criteria of design?

4. Explain iterative waterfall and spiral model for software life cycle and various activities in each phase.

5. What is a prototype model? Under what circumstances is it beneficial to construct a prototype model?

6. Describe the Spiral Model of software development with strength, weakness. Also give the reason for using Spiral Model.

7. What is System Development Life Cycle(SDLC). Explain its Phases.

8. Discuss any two software life cycle models in detail.

9. Explain Spiral model and win-win spiral model in detail?

10. Estimate the effort parameters from the set of data as shown in table.

Project	Size(KLOC)	Effort(PM)
1.	30	84
2.	20	56
3.	50	140
4.	10	28

11. Software is only element of a larger system with subsystem. Propose a set of phases for a software system life cycle.

UNIT – 2

1. What is Software Development Life Cycle (SWDLC) and explain the all phases of SWDLC.
2. Describe the COCOMO Model of Software engineering.
3. How we Estimate cost of a software by Constructive Cost model (COCOMO). Explain all three modes of COCOMO Model with example.
4. What are the relative advantages of using either the LOC or the FP metrics to measure the size of a software product?
5. Suppose that a system is developed and line of source instruction is 100KLOC. Compute the nominal effort and development time for each of the three development modes i.e. Organic, Semidetached and Embedded.

   Note:- Nominal effort means all the 15 Cost driver attribute have nominal values = 1. And Effort & Time Constant are given :-

Modes	a	b	c	d
Organic	3.2	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	2.8	1.20	2.5	0.32

6. Explain the Putnam resource allocation model and what are the limitations of this model?
7. What do you mean by Risk Analysis? Explain different steps of Risk Analysis.
8. Why requirement analysis is important in development of software? Describe analysis principles in details.
9. Explain in detail available for project scheduling? With an example describe how to track the schedule?

10. Define Requirement Analysis. Write Requirement Analysis principles. Also Explain FAST & DFD Techniques of Requirement Analysis.

11. Define SRS. Also List desirable characteristics of a good SRS document.

12. What are the umbrella activities of a software process?

13. Compute the function point value for the project with the following information domain characteristics.

    Number of user input=32

    Number of user output=60

    Number of user inquiries=24

    Number of files=8

    Number of external interface=2

    Assuming, the weighting factors value are average. The various complexity adjustments values are average.

14. Compute the function point, Productivity, Documentation, Cost per function point for the following data :

    Number of user input = 24

    Number of User Output =46

    Number of Inquires=8

    Number of Files=4

    Number of External Interface=2

    Effort=36.9 PM

    Technical Documents=265 Pages

    User Documents=122 Pages

    Cost=$7744/month

    And the various processing complexity factors are : 4,1,0,3,3,5,4,4,3,3,2,2,4,5.

15. Estimate the effort required,the nominal development time and the total number of people to develop the organic model software product,where the project size is 33,200 line of code.

UNIT – 3

1. a) Elaborate all requirements analysis principles.

   b) Construction an FSA which recognizes the following set of words :

   (Read,Rest,Revise,Right,Revisit)

   c) What do you understand by data dictionary ? where and how it is used ?

2. a) What is prototyping? Give the sequence the events needed in prototyping.

   b) Write a short note on requirement analysis.

3. i) What are the goals of Software Requirement Specification?

   ii) Describe the components of software requirement Specification?

4. What re elements of requirement analysis model. Explain.

5. Discuss the finite state machine models.

6. Illustrate the types of software requirements.

7. What do you mean by the requirement, requirements analysis and requirement engineering? Explain them with the help of an example.

8. List the five desirable categories of users of the SRS document ? What are their expectations from the SRS document ?

9. Briefly explain the various characteristics of requirements.

10. Sort notes on :

    a) The Role of System Analyst

    b) SRS Review

    c) SRS Representation Guidelines

    d) Analysis Principle

11. Draw the DFD of :

    a) Library Management System

    b) Railway Reservation System

    c) Payroll System

12. Consider a photocopying machine :

   i)   Construct a DFD upto level 1 to illustrate its working.

   ii)   Also create level 2 DFD for one of the level 1 bubbles of above DFD.Also
           convert this DFD into CFD.

UNIT – 4

1. How functional independence is achieved in effective modular design.
2. Explain the following concepts with example :
   a) Abstraction
   b) Modularity
   c) Information hiding
3. Write a short note on design documentation.
4. Write short note on DFD and CFD.
5. What are software design principles and concepts?
6. How are concepts of coupling and software portability related? Give examples.
7. List software design fundamentals and explain each giving suitable examples.
8. a) Describe coupling and cohesion properties of module.

   b) What is structured chart? Explain the role of it in Structured Design Methodology.

9. Explain the following :
   a) Decomposition
   b) Structure portioning
   c) Stepwise Refinement
   d) Data Structure

10. Explain why it may be require to design the software architecture before the software
    design specification(SDS) is written.

UNIT – 5

1. Explain Object Oriented concept with an example.
2. Differentiate between classes and objects. Discuss the object oriented concepts.
3. With the help of an example. Explain how the inheritance feature of the object oriented paradigm helps in code reuse?
4. a) What is Object Oriented Analysis?
    b) What is Data Oriented Analysis?

5. Give the similarities and difference between object oriented and functional design approaches.
6. Short notes on :
    a) Refining operation
    b) Unified modeling language
    c) Object modularization

7. What is the difference between Function-Oriented Design and Object-Oriented Design ?
8. Explain about the various design concepts considered during design?
9. Explain data architectural and procedural design for software.
10. a) What is Object Oriented analysis?
    b) Describe design tools and techniques.

SUBJECT: COMPUTER GRAPHICS [CS/IT 405]

UNIT-I

Que. 01. Explain the Raster Scan Graphics with application area of Raster Graphics. Also explain how we generate a raster image.

Que. 02. Differentiate between: -

(a) Random Scan and Raster Scan.
(b) Beam penetration method and Shadow mask method.

Que. 03. Explain the working principle of dot matrix, inkjet and laser printer.

Que. 04. What is the advantage of using interlaced monitors?

Que. 05. What is the purpose of a display processor in computer system? Give the architecture of a raster graphics system with a display processor.

Que. 06. Standard TV has 480 scan lines if the aspect ratio is ¾ what is the capacity of frame buffer needed in 2 bits per pixel is used?

Que. 07. Describe working of CRT (cathode ray tube) monitor. How different grey levels are incorporated in it?

Que. 08. What is basic purpose of interactive input devices? What are basic functions provided by these input devices?

Que. 09. Describe briefly the various graphical input and positioning techniques.

Que. 10. Explain working principle of scanner, track ball, digitizers (graphics tablets), and joysticks.

Que. 11. Explain following terms in Raster Scan System: -

(a) Refreshing
(b) Flicking
(c) Interlacing
(d) Resolution

UNIT-II

Que. 12. Explain line drawing DDA method and also give algorithm of it.

Que. 13. Derive the decision parameter to draw line using Bresenham's algorithm.

Que. 14. Explain Bezier curve with its properties and compare this curve with B-sp-line curve.

Que. 15. Find the points lying on the circle centered at (5, 10) and having radius 8 using Bresenham's circle algorithm (Mid Point).

Que. 16. Derive the decision parameter to draw circle using Bresenham's algorithm (Mid Point).

Que. 17. What are drawbacks of DDA line drawing algorithm? How they are removed or minimized in Bresenham's algorithm?

Que. 18. Describe symmetric DDA algorithm for circle drawing and tell advantages over general method.

Que. 19. What are the advantages and disadvantages of Bresenham's algorithm?

Que. 20. Describe general method of circle drawing and tell its disadvantages.

UNIT-III

Que. 21. A triangle having the vertex at A (0, 0), B (5, 5) and C (10, 4). Find the transformation matrix for rotation of 45^0 about origin.

Que. 22. Why are homogeneous coordinates are needed in transformation matrices? Derive the transformation matrix for rotation about origin by angle in a anticlockwise direction.

Que. 23. Explain the perspective transformation.

Que. 24. Find out show the transformer to reflect a polygon whose vertices are A(-1, 0), B(0, -2), C(1, 0), and D(0, 2) about the line y= x+2.

Que. 25. Calculate three transformation matrixes for producing any parallel projection of say point (a, b, c) on to xy plane.

Que. 26. Consider a live segment AB with end points A(4, 3, 2) and B(8, 3, 2) find out perspective projection of AB onto plane x=0 from centre of project at x=-4.

Que. 27. What is perspective projection? What do you mean by vanishing point and perspective fore shortening?

Que. 28. An object is to be rotated about 45^0 about a_c axis passing through origin and point (12, 20, 10). Work out transformation to carry out.

Que. 29. Explain representation of 3D objects on 2D screen.

Que. 30. Show that two successive reflections about either of the coordinate's axes is equivalent to a single rotation about the coordinate origin.

Que. 31.

Explain the following transformation with respect to origin in 2D and 3D coordinate system and also give matrix representation: -

    (i)   Translation
    (ii)   Rotation
    (iii)   Scaling
    (iv)   Reflection

UNIT-IV

Que. 32.

What is line clipping? Explain any one polygon clipping algorithm.

Que. 33.

What is the difference between Gouraud shading and Phong shading? Explain any one rendering method.

Que. 34.

Explain basic ray tracing method.

Que. 35.

What do you know about color models? Give the transformation equation from one to another color model for any two.

Que. 36.

How to eliminate the hidden surface by object space method?

Que. 37.

Explain the image space method of hidden surface elimination.

Que. 38.

Explain the following basic illumination models:

(i)   Diffuse Reflection
(ii)   Specular Reflection

Que. 39.

Explain following color model:

(i)   RGB
(ii)   YIQ

Que. 40.

Write short note on any three: -

(i)   Phong Shading
(ii)   Gourand Shading
(iii) CMY Color Model
(iv)   HSV Color Model

UNIT-V

Que. 41.

Describe different multimedia components in detail.

Que. 42.

 "Without multimedia graphics is incomplete" Comment on this. Explore the application of Multimedia.

Que. 43.

What is SCSI? What is role of it in computer system?

Que. 44.

How to use IDE interface for connecting devices?

Que. 45.

What is the role of MCI in multimedia application?

Que. 46.

Explain any two multimedia file formats.

Que. 47.

Explain various multimedia tools in brief.

Que. 48.

What is the role of MIDI in multimedia system?

Que. 49.

Explain following file formats: -

(i)   RTF
(ii)   TIFF
(iii) DIB

Que. 50.

Write short note on any two:

(i)   Multimedia Tools
(ii)   JPEG
(iii) MPEG

Theory of Computation (CS406)

Unit I

Q1. What is a compiler? Explain the various phases of compiler in detail, with a neat sketch.

Q2. What do you mean by System Software?

Q3. Explain Chomsky classification of languages in detail.

Q4. Draw a NFA for a*|b*.

Q5. What is an ambiguous grammar? Give an example.

Q6. Define the context free grammars in the 4 tuple form. (V, T, P, S) for the given languages on Σ (a, b).

      i. All strings having atleast two 'a's.

      ii. All possible strings not containing triple 'b's.

Q7. Find the context free grammar with no useless symbols equivalent to

      S→AB/Ca, B→BC/AB, A→a, C→aB/b.

Q8. State in English about the language corresponding to below given grammar

      S→aB/bA, A→a/aS/bAA , B→b/bS/aBB.

Q9. The set of strings over alphabet{0,1,.........,9} such that the final digit has not appeared before.

Q10. The set of strings of 0's and 1's such that there are two 0's separated by a number of positions that is a multiple of 4. Note that 0 is an allowable multiple of 4.

Unit II

Q1. What do you mean by Greibach Normal Form (GNF).

Q2. When is a CFG said to be in GNF?

Q3. Convert the following grammar into GNF :

S→AB
A→BS/b
B→SA/a

Q4. Find the PDA with only one state that accepts the language $\{a_m b_n : n > m \}$

Q5. Construct the PDA that recognizes the languages $L=\{x= \times R: x \in \{a, b\} \}$.

Q6. Obtain a CFG to generate unequal number of a's and b's.

Q7. Obtain a CFG to obtain balanced set of parentheses.(i.e every left parentheses should match with the corresponding right parentheses).

Q8. Reduce the Grammar G given by S→aAa

A→Sb/bcc/DaA
C→abb/DD
E→ac

D→aDA

into an equivalent grammar by removing useless symbols and useless productions from it.

Q9. Convert the following grammar into CNF.

S→aAD
A→aB/bAB
B→b
D→d.

Q10. Let G be the grammar given by

S→aABB/aAA,
A→aBB/a,
B→bBB/A

Construct the PDA that accepts the language generated by this grammar G.

Unit III

Q1. What are the types of Turing Machines explain in brief;

Q2. Explain the importance of Turing machine concept

Q3. Give a Turing machine for the following:

(a) That computes ones complement of a binary number

(b) That shifts the input string, over the alphabet (0,1) by one position right by inserting '#'as the first character.

Q4. Design a T.M for copying of information from one place to the other place. Assume all the necessary assumptions. Give Example of the working of your T.M.

Q5. Explain Turing reducibility machines.

Q6. What is the difference between a recursive and recursively enumerable Languages?

Q7. What do you mean by saying that the halting problem of TM is undecidable ?

Q8. Construct a Turing machine that can accept the set of all even palindromes over {0.1}.

Q9. Construct a Turing machine that convert a binary string into its equivalent unary strings.

Q10. Construct a Turing machine that enumerates $\{ 0^n1^n|\ n>=1\}$.

Unit IV

Q1. What are NP-complete and NP-hard problems? Explain them with examples.

Q2. Explain Savich theorem with an example.

Q3. If L is a recursive language then prove that L̶ is also recursive.

Q4. What is Post correspondence problem? Explain with an example.

Q5. The set of all languages whose complements are in **NP** is called **CO-NP.** Prove that **NP = CO-NP** if and only if there is some *NP*-complete problem whose complement is in **NP**

Q6. Define Turing machine formally; explain how Turing machine can be used to compute integer functions. Design the Turing machine to compute following function, Show its transition diagram also f(x,y)=xy where x and y are positive integers represented in unary.

Q7. Show that if L and L? are recursively enumerable, and then L is recursive.

Q8 Explain Church- Turing Thesis.

Q9　(a)　Define　Turing　machine　for　computing　f(m,n)　=
　　　　　m – n (proper subtraction).

　　(b)　Construct　a　Turning　machine　that　accepts
　　　　　$L = \{0^{2^n}|n>=0\}$

Q10 (a) Design a Turing Machine to compute f(m + n), V m,n > = 0 and simulate their action on the input 0100.

(b) Explain how a Tuning machine with multiple tracks of the tape can be used to determine if the given number is prime or not?

Unit V

Q1 a) Illustrate that Linear Bound Automata is special case of TM with bounded tape.

(b) Show that every type 1 grammer can have corresponding TM.

Q2. (a) Show that each of the classes of language l_0, l_{scl}, l_{cfl}, l_{rl} is closed under transpose, transitivity, idempotent operation .

(b) Define Chomsky hierarchy of languages.

Q3. (a) Show that RE a Type 3 language is Acceptable by Finite Automa?

(b) Show that LBA is a special case of universal Turing machine?

Q4. (a) Show that every Type 2 grammar can have corresponding PDA?

(b) Show that each of the classes ℓ_0, ℓ_{cs1}, ℓ_{cf1}, ℓ_{r1} is closed under transpose operation.

Q5. What are NP-complete and NP-hard problems? Explain them with examples.

Q6. Define linear bounded automaton (LBA). List out the constraints of LBA.

Q7. Discuss the Chomsky classification.

Q8. Explain post correspondence problem with an example.

Q9. Show that AMBIGUITY problem is un-decidable. What are the different types of grammars/languages?

Q10. (a) When we say a problem is decidable? Give an example of undecidable

problem?

(b) What are(a) recursively enumerable languages (b) recursive sets?

(c) When a recursively enumerable language is said to be recursive? Is it true that the language accepted by a non-deterministic Turing machine is different from recursively enumerable language?

Java 2 Enterprise Edition (CS 501)

Unit-1

Q1. What is Java Bean? Explain the properties of java bean with suitable example

Q2. What is BDK? Explain the advantage & disadvantage of BDK.

Q3. What is CGI? Why servlet is better than CGI.

Q4. What is servlet? Explain the life cycle of servlet.

Q5. Give the advantage & disadvantage of servlet over CGI.

Q6. Write a program to create sample servlet.

Q7. Write the steps to Installing & configuration of apache server over standalone servlet.

Q8. What is HTTP package? Explain the role & responsibility of Http request & Httpresponse

Method.

Q9. What is session tracking? Explain the way of handling session in servlet.

Q10. What are cookies? How to handle cookies in servlet explain it with suitable example.

Q11. Write a program to create servlet to handle session.

Unit-2

Q12. What is JSP? Explain the life cycle of JSP with suitable diagram.

Q13. What are the difference between applet & Servlet?

Q14. What are the implicit objects in JSP? Describe it

Q15. Write a JSP program to calculate the factorial of a given number.

Q16. Write a JSP program to design Employee registration form.

Q17. What is an error & exception? How to handle error in JSP page.

Q18. What is tier? Explain tier1, tier2, tier3 architecture of J2EE.

Q19. What is J2EE? Explain the architecture of J2EE with suitable diagram.

Q20. What is Session sharing in JSP? Write a sample program of session sharing in JSP.

Q21. What is Data Sharing? Write a sample program of data sharing in JSP pages.

Unit-3

Q22. What is Application server? Explain the types of application server.

Q23. What is Web Server? Explain the types of Web Server.

Q24. Give the difference between application Server & Web Server.

Q25. What JDBC? Explain the role & responsibility of JDBC API.

Q26. What is Javax.sql.* packages? Explain the list of classes & Interfaces in Javax.sql.*

Packages.

Q27. What is Driver Manager Class? Explain the types JDBC Driver with suitable diagram.

Q28. What is Thin Driver? Which driver is fast among the four JDBCdrivers give the reason?

Q29. Write a JSP program to connect MS Access database.

Q30. What is Struts Framework? Explain the architecture of struts framework with suitable

Diagram.

Q31. What is statement? Explain the types of statement in JDBC.

Q32. What are the difference between prepared statement & Callable Statement?

Unit 4.

Q33. What is Distributed Computing? Explain the list of technology which provides distributed

Computing.

Q34. What is RMI? Explain the architecture of RMI with suitable diagram.

Q35. Write a RMI program to communicate a client to remotely available server.

Q36. What is CORBA? Explain the difference between RMI & CORBA.

Q37. What are the differences between COM & DCOM?

Q38. What are Active objects in RMI? What is does.

Q39. What are differences between Stub & Skelton?

Q40. What is MVC? Describe the MVC design pattern with suitable diagram.

Unit-5.

Q41. Write a program using JSP to set up a simple counter and demonstrate

Declarations, script lets, and expressing working together.

Q.42. What is EJB? Explain the Architecture of EJB with suitable diagram.

Q43. What is EJB life cycle? Describe it with suitable diagram.

Q44. How many types of bean as you Know. Explain it in details.

Q45. Explain the life cycle of State full session bean.

Q46. Explain the life cycle of stateless session bean.

Q47. Explain the life cycle of Message driven bean.

Q48. Explain the life cycle of Entity beans in details.

Q49. Build a Web interface that will allow users to retrieve a listing of J2EE books from a

Computer books database. Users will be able to query the database on one or more of

The following criteria.

- Title, author
- And Publishing year.
- Create the database in Microsoft Access.

Q50. Write a program to develop a java bean in a JSP page. You are required to develop

The colorful alphabet list such that the presentation of letters remains the

Responsibility of the JSP page. But the color mapping will be the beans' job.

Computer Networks (CS502)

UNIT – 1

QUE.1) What is computer network? Discuss various types of networks topologies in computer network. Also discuss various advantages and disadvantages of each topology.

QUE.2) (a) What are the applications of Computer Networks?

(b) Explain the advantages and disadvantages of computer network.

QUE.3) Explain the following:-

a) LAN

b) MAN

c) WAN

d) ARPANET

QUE.4) What is IP addressing? How it is classified? How is subnet addressing is performed?

QUE.5) Explain in detail Internet Backbones in detail.

QUE.6) What is the difference between NAP's and ISPs

QUE.7) Explain in detail Access Networks and Physical Media

QUE.8) What is vulnerable period? How it affects the performance in MAC protocols?

QUE.9) What are the different types of cabling supported by Ethernet standard?

QUE.10) What is OSI Model? Explain the functions and protocols and services of each layer?

UNIT – 2

QUE.1) What is TCP/IP Model? Explain the functions and protocols and services of each layer? Compare it with OSI Model.

QUE.2) What is IPv6? Explain its advantages over IPv4. Also explain its frame format.

QUE.3) How does DNS Work. explain complete process.

QUE.4) What are header and trailers and how do they get added and removed?

QUE.5) Explain the mail services Electronic mail,SMTP,POP,POP3.

QUE.6) Explain the type of generic domains?

QUE.7) What are the applications of application layer?

QUE.8) Why do HTTP,FTP,SMTP,POP3and ICMP run on top of TCP rather then UDP?

QUE.9) Explain the process of ARP and RARP?

QUE.10) Explain the following:-

a) SMTP

b) DNS

c) FTP

d) Electronic mail

UNIT – 3

QUE.1) Explain the Multiplexing and Demultiplexing applications with example

QUE.2) Explain the following:

a) TCP

b) UDP

QUE.3) Explain in detail CSMA Protocol in detail.

QUE.4) Explain in detail CSMA/CD Protocol in detail. How it detects collision.

QUE.5) Distinguish between TCP and UDP and explain each field of TCP and UDP header formats?

QUE.6) How are TCP and UDP used differently on the basis of different applications?

QUE.7) Why TCP control the conjuction.justify your answer.

QUE.8) Explain the Principles of Reliable Data Transfer-Go back to N and Selective Repeat

QUE.9) What is the process of TCP connection management explain with example.

QUE.10) Write Short Note on

a) Segment Structure

b) Sequence Numbers

c) Acknowledgement numbers

UNIT –4

QUE.1) What is pure ALOHA and slotted ALOHA? Consider the delay of both at low load. Which one is less? Explain your answer.

QUE.2) What is the difference between routing in circuit switching network and packet switching network.Discuss the advantages and disadvantages of bothof them.

QUE.3) What is the difference between IPV4 and IPV6 addressing schemes. Discuss in detail the characteristics of IPV6.

QUE.4) Expalin the type of routing algorithms with example.

QUE.5) What is the difference between Link State routing Algorithm and distant Vector routing Algorithm

QUE.6) What is the Router Components. explain briefly?

QUE.7) Explain the Point To Point Protocol (PPP) with Header format.

QUE.8) What is PPP,LCP and PAP. explain with Header format and example.

QUE.9) Explain the Authentication PAP and CHAP and Network Control Protocol (NCP).

QUE.10) Write short note on.

a) Point To Point Protocol (PPP)

b) Network Control Protocol (NCP

UNIT –5

QUE.1) Write various SONET multiplexing functions.

QUE.2) Explain the SONET Topologies?

QUE.3) Explain the Synchronous Transport Signals with example.

QUE.4) What is Virtual Tributaries and also explain types of Virtual Tributaries.

QUE.5) What is the difference between SONET Devices (Sections, Lines and Paths)?

QUE.6) Explain pure-ALOHA and slotted- ALOHA systems. Give the expression for throughout for each,clearly explaining the various terms.

QUE.7) Explain 1-persistent, p-persistent and 0-persistent CSMA giving strong and weak points of each.

QUE.8) If the transmitted code word is 10011000 and the received code word is 11001001. Whatis the error word ? Write transmitted code word , received code word and error word as polynomials.

QUE.9) What are the advantages of cell switching that is used in ATM?

QUE.10) What is the average number of transmission required to send a frame of length 1600 bytes correctly, if the bit error rate is 1 x 10-6

Advanced Software Engineering (CS503)

UNIT – I

1. What are the four elements that exist when an effective SCM system is implemented? Discuss each briefly.
2. Briefly describe the difference between SCM for conventional software and SCM for WebApps.
3. Explain Version Control, Change Control and Configuration Audit in SCM System.
4. Discuss the reasons for baselines in your own words.
5. Why would a software development team want to make use of an independent software quality assurance group?
6. What are the SQA elements in Software Project? Explain it.
7. The MTBF Concept for software is open to criticism .Explain why?
8. Write Short Notes on:
   a) SCM Process
   b) Baselines
   c) Configuration Audit
9. You have been given the responsibility for improving the quality of software across your organization. What is the first thing that you should do? What is the next thing?
10. Explain the difference between availability and reliability.

UNIT – II

1. What do you understand by the term Software Testing? Why is Testing Important? What is the difference between Software Testing & Debugging?

2. (a):- Why unit testing is so important? Explain the concept of unit testing in detail.
   (b):- Distinguish between black box and white box testing with suitable example?

3. What is White box testing? And how we calculate the Cyclomatic complexity with graphical example?

4. What categories of errors are traceable using Black box testing? Explain in detail the following Black box testing methods:
   a) Boundary Value Analysis
   b) Orthogonal Array Testing
   c) Equivalence Partitioning

5. What types of tests are conducted for client server system? And also explain effective strategy for testing a real time system?

6. Describe the difference between verification and validation. do both make use of test case design methods and testing strategies?

7. Discuss the differences between black box and white box testing models. Discuss how these testing models may be used together to test a program module.

8. What type of testing are required for specialized environments, architecture and applications.

9. Short Notes on:
   a) Information Gathering
   b) Fault Isolation,
   c) Fault Confirmation
   d) Fixing fault

10. (a)Explain top-down approach used in Integration Testing
    (b) Explain the types of System Testing

UNIT – III

1. What is Software Quality? Explain in details
   a) ISO 12207 quality factors
   b) ISO 9126 Quality factors
      What are the difficulties in assessing software quality?

2. How we select the right person for the job? Write down the requirements for the selecting the person.

3. Explain the planning steps of BS 6079 Standard.

4. What are the importance and defining software quality of international standards.

5. Consider the following team structure

    A senior programmer and some junior programmers form a team that is called a Chief Programmer team. Compare the communication paths in this structure with controlled decentralized structure. What are the advantages and disadvantages of this structure? Under what conditions will you suggest that this structure be used?

6. Annual charge Traffic in software is 30% per year. The initial development cost was Rs. 20 Lakhs. Total lifetime for the software is 10 years. What is the total cost of software systems?

7. a) Explain the methods to increase staff motivation.

    b) Write a note on Leadership styles.

8. Explain How :
    i)   To improve group performance
    ii)   Controlling changes to a project requirements

9. Describe the Organizational Structure and behavior of right person for the job.

UNIT – IV

1. What is the purpose of a configuration models and how does the navigation models differ from the interaction models.

2. What is a frame work and how does it differ from a pattern? What is an idiom and how does it differ from a pattern?

3. What is the difference between content architecture and WebApp architecture?

4. Suppose you are a WebApp designer for Future learning Cooperation, a distance learning company. You intend to implement an internet based "learning engine" that will enable you to deliver course content to students. The learning engine provides the basic

infrastructure for delivering learning content on an subject. Develop a prototype interface design for the learning engine.

5. How we calculate the Load (Throughput P) of any web application ? Consider a popular sports news site. At a given moment, 20,000 concurrent users submit a request once every 2 minutes on average. Each transaction requires the webapp to download a new article that average 3K byte in length.

6. Describe the steps associated with database testing for a webapp. Is database testing predominantly a client side or server side activity?

7. Explain the WebApp testing process with the design diagram.

8. Discuss the objective of testing in a WebApp context.

9. Which errors tend to be more serious client side errors and server side errors? Why?

10. What characteristics of usability become the focus of testing and what specific objectives are addressed?

UNIT – V

1. What is the Difference between reverse engineering and forward engineering?

2. What are the nine parameters of Cost benefit analysis model for reengineering .how we compute the overall benefit of reengineering?

3.   What are the different phases in project development? Explain design phase with its decomposition for ATM system.

4. Describe the software reengineering process model with various phases.

5. What option exists when we are faced with a poorly designed and implemented program?

6. Write down the characteristics of three software restructuring tools.

7. Explain the steps to develop design of a web site. What are the main characteristics of a good web design?

8. What are the Software project Management standards?

9. Explain the term CASE tools. Describe briefly various CASE tools.

10. What interaction mechanisms are available to WebApp designers?

11. Several organizations do not have their own software development divisions and they outsource the work of Software Development to External Software Development organizations. Is it justified to outsource all types of software projects or should outsourcing be limited to only some categories? Explain your answer.

Design Analysis & Algorithm (CS505/IT505)

UNIT-I

Que. 01. (a) What is an algorithm? Explain in short characteristic of an algorithm?

(b) What do you understand by analyzing an algorithm? Explain types of analysis.

Que. 02. (a) What do you understand by space and time complexity of an algorithm?

(b) Calculate the space and time complexity of selection sorting algorithm.

Que. 03. What is the importance of notations in the analysis of algorithm? Explain the various notations in brief.

Que. 04. Explain Master Theorem for solving recurrence of the form:

$$T(n) = aT(n/b)+f(n)$$

Que. 05. Prove the following with proper value of constant C and n_o

      (i) $7n+5 = O(n)$
      (ii) $10n^2+4n+2= O(n^2)$
      (iii) $10n^2+7 = \Omega(n^2)$
      (iv) $3n+2 = \theta(n)$

Que. 06. How do we analyze the time complexity of the algorithm that are based on divide and conquer techniques?

Que. 07. (a) Derive the recurrence for time complexity of binary search and solve it.

(b) What is the basis approach behind solving any problem using Greedy method?

Que. 08. How fractional knapsack problem can be solved using Greedy method? Discuss with an example. Also discuss its time complexity.

Que. 09. (a) Discuss the Greedy solution for the optimal merge pattern problem.

(b) For the following files with number of records as shown, draw the optimal merge pattern tree: 4, 3, 5, 8, 11, 13.

Que. 10. Discuss the Kruskal's algorithm for finding minimum spanning tree for a graph with an example.

UNIT –II

Que. 11. Describe matrix chain multiplication problem. Write algorithm for getting optimal paranthesization of matrix chain multiplication. Compute the complexity of this algorithm.

Que. 12. Find an optimal solution of a matrix chain multiplication whose sequence of dimension is 5, 10, 3, 12, 5.

Que. 13. What is principal of optimality? Explain 0/1 knapsack problem using dynamic programming.

Que. 14. Solve the following instance of 0/1 knapsack problem using dynamic programming method. Find out optimal load and included objects. Knapsack Capacity = 5

Item	1	2	3	4
Profit	3	4	5	6
Weight	2	3	4	5

Que. 15. (a) Discuss the solution of LCS problem using dynamic programming method.

(b) Consider two string A = "MOON" and B = "MORN". Find longest common subsequence.

Que. 16. What do you understand by branch and bound techniques?

Que. 17. Solve the following instance of Traveling Salesperson (TSP) using branch and bound technique. Given below is the cost matrix.

∞	8	8	11	6
11	∞	4	10	9
10	7	∞	5	5
9	3	4	∞	5
6	9	5	5	∞

Que. 18. What is backtracking? Explain with an example.

Que. 19. (a) What is N-Queen problem? Why do we require backtracking to solve it?

(b) Solve the 4-queens problem.

Que. 20. What is lower bound theory? Explain where it is applicable.

UNIT-III

Que. 21. What do you understand by pattern matching? Discuss the algorithm for Naïve string matching. Also discuss its complexity.

Que. 22. Search the pattern "nath" in the string "jagannath university" by the Naive string matching algorithm.

Que. 23. What is Rabin-Karp string matching algorithm? Discuss the concept behind it. Also give the complexity of it.

Que. 24. Find out the pattern P=31415 in the text T=2359023141526739921 by Rabin Karp method.

Que. 25. How failure function helps in string matching in KMP matcher. Discuss the complexity of KMP algorithm.

Que. 26. What do you understand by Good Suffix and Bad Character heuristics used by Boyer-Moore algorithm? Discuss them using an example.

Que. 27. Find out the failure function for the pattern P = abababbabaabba.

Que. 28. (a) What is assignment problem? What are the applications of it?

   (b) Solve the following assignment problem, where Jobs with costs of M are disallowed assignments.

	J1	J2	J3	J4	J5
M1	M	8	6	12	1
M2	15	12	7	M	10
M3	10	M	5	14	M
M4	12	M	12	16	15
M5	18	17	14	M	13

Que. 29. Solve the following assignment problem.

A company has 4 machines available for assignment to 4 tasks. Any machine can be assigned to any task, and each task requires processing by one machine. The time required to set up each machine for the processing of each task is given in the table below.

TIME (Hours)

Machine/ Task	Task 1	Task 2	Task 3	Task 4
Machine 1	13	4	7	6
Machine 2	1	11	5	4
Machine 3	6	7	2	8
Machine 4	1	3	5	9

The company wants to minimize the total setup time needed for the processing of all four

Tasks.

Que. 30. Explain Quadratic assignment problem with example.

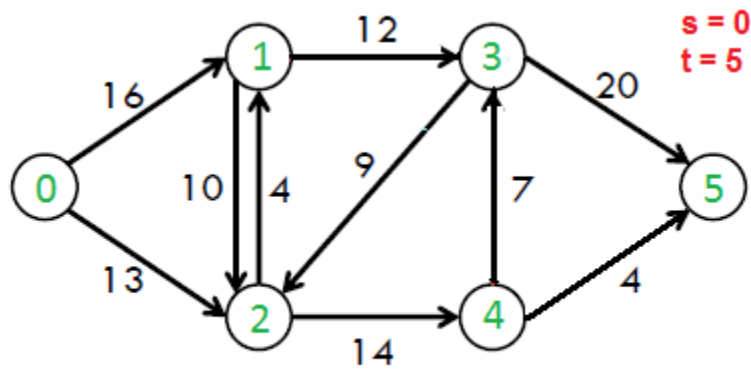**UNIT-IV**

Que. 31. What is randomized algorithms? What is the concept behind randomized algorithms?

Que. 32. (a) Why should we use randomized algorithm?

(b) What are the two main types of randomized algorithms?

Que. 33. (a) Discuss in detail randomized min-cut algorithm.

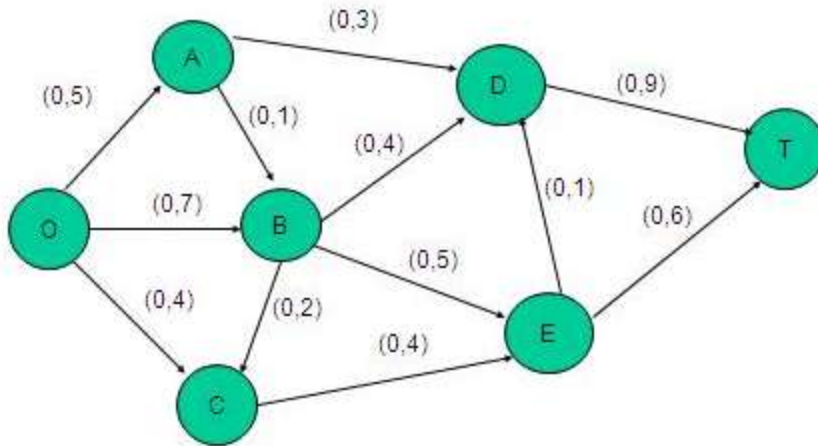(b) Find out the Min Cut for following given problem.

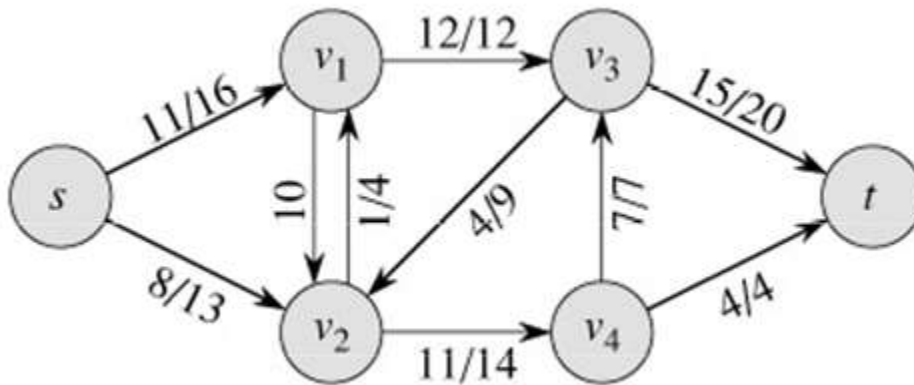**Que. 34.** What is 2-SAT problem? Discuss the randomized algorithm for the same.

Que. 35. How Las Vegas and Monte Carlo randomized algorithm differs?

Que. 36. (a) What do you understand by flow and flow networks?

(b) Find out the maximum flow for given network from source O to sink T

Que. 37. Find out the residual network for given flow network.

Que. 38. Discuss the problem of maximum flow in a flow network.

Que. 39. What do you understand by flow shop scheduling? Discuss its related types.

Que. 40. Define the problem of network capacity assignment.

UNIT-V

Que. 41. What do you understand by complexity classes P, NP, NPC, and NP-hard? Define them.

Que. 42. What are the decision problems? How can you convert an optimization problem into decision problem?
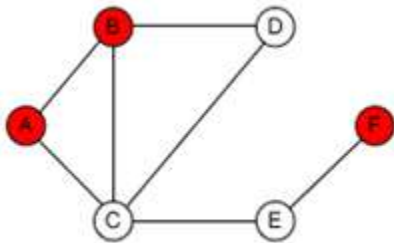
Que. 43. What is Cook-Levin / Cook's theorem? What is the significance of it?

Que. 44. (a) What do you understand by approximation algorithms? Why and where they are useful?

(b) Give the approximation algorithm for vertex cover and set cover problem.

Que. 45. Find out the smaller number of sets for following set cover problem. Universal set U = { 1,2,3,4,5} and the set of sets S = {{1,2,3},{2,4},{3,4},{4,5}}.

Que. 46. Find out the minimum vertex cover set for following graph by approximation algorithm.

Que. 47. Give the definition of P, NP-Hard and NP-complete problem, also give the examples of these problem.

Que. 48. (a) How do we prove that a given problem is in NP?

(b) How do we prove that a given problem is in NPC?

Que. 49. Discuss the concept of deterministic and non deterministic algorithms.

Que. 50. Define the following problems related to NPC:

        (i)   Vertex Cover
        (ii)   Clique
        (iii)   SAT and its variants

Computer Organization & Architecture-(CS 506)

UNIT-1

Q.1   What is register transfer language? Explain the data movement among registers.

Q.2   What is control function? Explain with block diagram & timing diagram.

Q.3   Explain common bus system for 4-bit four register.

Q.4   What are three state bus buffers? Explain with diagram.

Q.5   What are microoperations? Classify different category.

Q.6   Show the block diagram of the hardware that implements the following register transfer statement:

   T2:   R2 ⟵   R1,   R1 ⟵ R2

Q.7   Explain 4-bit binary adder- subtractor with diagram.

Q.8   Explain 4-bit binary incrementer.

Q.9   Explain 4-bit binary arithmetic circuit.

Q.10   Explain the hardware implementation of logic microoperation.

UNIT-2

Q.1   What is central processing unit? Explain with its major components.

Q.2   Explain CPU general register organization.

Q.3   Explain Stack organization of memory & its function.

Q.4   What do you understand by instruction format? Explain different types of instruction format.

Q.5   What is addressing mode? Explain different types of addressing mode.

Q.6   An instruction is stored at location 300 with its address field at location 301. The address field has the value 400. A processor register R1 contains the number 200. Evaluate the effective address if the addressing mode of the instruction is (a) direct (b) immediate (c) relative (d) register indirect (e) index with R1 as the index register.

Q.7   Explain the subroutine call & return.

Q.8   What is program interrupt? Explain the different types of interrupt.

Q.9   What is instruction pipeline? Explain four segment instruction pipeline.

Q.10   What is parallel processing? Explain different types of parallel processing.

UNIT-3

Q.1   Explain hardware implementation of addition & subtraction with signed magnitude data.

Q.2   Explain Hardware algorithm with flow chart for add & subtract operation signed magnitude data.

Q.3   Explain algorithms for addition & subtraction with in signed-2's complement representation.

Q.4   Explain the flow chart of multiplication algorithm for signed magnitude data.

Q.5   Implement the multiplication of 23(10111) and 19(10011) using multiply algorithm.

Q.6   Explain the hardware implementation of Booth multiplication algorithm.

Q.7   Explain the Booth algorithm using flow chart.

Q.8   Implement the multiplication of (-9) * (-13) using Booth algorithm.

Q.9   What is array multiplier?

Q.10   Explain the hardware implementation of 4-bit by 3-bit array multiplier.

UNIT-4

Q.1   What is control memory? Explain the microinstruction microprogram.

Q.2   Explain the micro programmed control organization with diagram.

Q.3   What is control address register?

Q.4   Explain the next address sequencer.

Q.5   Explain the microinstruction format.

Q.6   Explain the Horizontal microinstruction format.

Q.7   Explain the vertical microinstruction format

Q.8   Using the mapping procedure described the first microinstruction format for the following operation code (a) 0010 (b) 1011 (c) 1111

Q.9   Formulate a mapping procedure that provides eight consecutive microinstruction for each routine. The operation code has six bits and the control memory has 2048 words.

Q.10 Explain the difference between hardwired control and micro programmed control.

UNIT-5

Q.1 Explain the Memory hierarchy in a computer system.

Q.2 What is ROM ? Explain the Bootstrap loader.

Q.3 What is RAM? Explain the working with block diagram.

Q.4 (a) How many 128 x 8 RAM chips are required to provide a memory capacity of 2048 bytes?

(b) How many lines of the address bus must be used to access 2048 bytes of memory?

Q.5 What is Associative Memory/ explain its hardware organization.

Q.6 What is Cache memory? Explain the locality of reference.

Q.7 find out the hit ratio of cache memory if total hits of cache is 50 and misses is 35.

Q.8 A computer uses RAM chips of 1024 x 1 Capacity.

(a) How many chips are needed, and how should their address lines be connected to provide a memory capacity of 1024 bytes.

(b) How many chips are needed to provide a memory capacity of 16K bytes?

Q.9 What is virtual memory? Explain the mapping of virtual address in memory table.

Q.10 What is DMA? Explain the working of DMA controller.

Advance Computer Architecture (CS 601)

Unit-1

Q1. What is computation? Explain the architecture of computation in advance computer

Architecture.

Q2. What is computational model? Explain the architecture of computational model.

Q3. What is Von Neumann's Architecture? Explain it in detail with suitable diagram.

Q4. Give the comparison between six computational models in brief.

Q5. State & prove that Von Neumann computational model follows the FSM (finite state

Machine model concept)

Q6. What is computer architecture? Give the difference between computer architecture &

Design.

Q7. What is parallel computing? Explain the types of parallel computing as you know.

Q8. Give the difference between Sequential & Parallel Super computers.

Q9. What is Parallel architectural classification scheme? Describe it in details.

Q10. What is difference between Flynn's & Handler' classification o computer architecture.

Unit-2

Q11. What is pipelining in parallel processors? Explain the properties of pipelining.

Q12. What is Linear & Non Linear Pipelining? Explain its types with suitable diagram.

Q13. What are the Handler's classifications of pipelining scheme of processing? Explain it in

Details.

Q14. What are the differences among the following pipelining?

- Arithmetic Pipelining
- Instruction Pipelining
- Processor Pipelining.

Q15. Write short notes on the following

- Unifunction Vs Multifunction pipelines.
- Static vs Dynamic pipelines.
- Scalar vs Vector pipelines.

Q16. How to measure the performance of pipelined processor. Give the technique or formula to

Measure the performance of pipelined processor.

Q17. What is VLIW architecture? Write its advantage & disadvantage of VLIW architecture.

Q18. Consider the execution of a program of 15000 instructions by linear pipeline processor.

The clock rate of pipeline is 25 MHz. Pipeline has five stages and one instruction is issued

Per clock cycle. Neglect penalties due to branch instructions and out of sequence

Execution

- Calculate the speed up program execution by pipeline as compared with that by non-pipelined processor.
- What are the efficiency and throughput of the pipeline processor?

Q19. A processor P1 is non-pipelined and has a clock rate of 25 MHz. It has average CPI=4.

Another processor (P2) has clock rate of 20 MHz. P2 is designed with five stages. P2 is

Improved successor of P1.

- If a program of 100 instructions is to be executed on both processors, what is the speed up of P2 compared to that of P1.
- Find MIPS rate of P1 as well as P2 during execution of the program.

Q20. What is Pipelining Scheduling? Explain the different types of pipelining scheduling

Technique as you knows.

Unit-3.

Q21. What is Microprocessor? Explain the types of processor as you know.

Q22. What is Scalar Processor? Explain the architecture of scalar processor.

Q23. What is Vector processor? Explain the architecture of Vector Processor.

Q24 Give the Difference between Scalar processor Vs Vector Processor.

Q25. What is RISC processor Architecture? Discuss its Design issues.

Q26. What is CISC Processor Architecture? Explain its design issues.

Q27. What is SIMD Architecture? Explain the SIMD Array processors.

Q28 what are Flynn's classification of computer architecture? Explain it in details.

Q29. What is Vector Super computer? Explain its Architecture with suitable diagram.

Q30. Write short notes on the following.

- **SISD**
- **MISD**
- **MIMD**

Unit-4

Q31. What is difference between Multiprocessor Vs Multi computers?

Q32. What is Interconnection Network? Explain the types of Interconnection Networks.

Q33. What is Network topology? Explain the static & dynamic network topology.

Q34. What is POSIX thread? Write a program to create POSIX thread.

Q35. What is Pipelining Hazards? Explain the types of Hazards.

Q36. What is Parallelism? Explain the types of Parallelism.

Q37. Give the difference between Implicit & Explicit parallelism.

Q38. What are dependencies? Explain the types of dependencies.

Q39. Given the following four statements S1-S4 find out the data dependencies by

Drawing its data dependence graph.

S1: Load R1, A

S2: Add R2, R1

S3: Move R1, R3

S4: Store B, R1

Q40. Consider another code snippet with some I/O operations:

S1: Read(4), A(I)

S2: Rewind (4)

S3: Write (4) , B(I)

S4: Rewind (4)

Unit-5

Q41. What is Data Flow graph? Explain the properties of Data flow graph.

Q42. What is Program Flow graph? Explain the properties of Program flow graph.

Q43. What Sparc processor? Explain the architecture of Sparc processor.

Q44. What is Activity template? Explain the uses of activity template.

Q45. What MIT Architecture. Explain it with suitable diagram.

Q46. Draw a data flow graph to compute the expression given below.

(x+y)*(x-y)

Q47. Consider the following while loop:

X=a

While(X<Y)

{

X=2*X;

}

Draw its data flow graph .Assume that the control input has T(initially)

Q48. What is Data flow computer architecture? Explain its working with suitable diagram.

Q49. Give the comparison among the Control flow, Data Flow & Demand Driven

Computers.

Q50. Draw a data flow graph to compute the following expression

$$(a2 + b2)/(a2 - b2)$$

Operating Systems & Unix Administration(CS 602)

UNIT – 1

1. What do you understand by Operating system? Also explain the role of operating system in computer.
2. Write short notes on following:
   a) Time Sharing Systems
   b) Main Frame Systems
   c) Parallel Systems
   d) Real Time systems
   e) Dual Mode Operation
3. What are the various services provided by Operating System? Explain in brief.
4. What do you understand by System Calls? Also explain the various types of system calls.
5. What do you understand by process and also write down the process states in detail.
6. What is the role of PCB (Process Control Block)? Also explain each component of PCB.
7. What do you understand by Schedulers? Also explain the various types of it.
8. What do you understand by Inter Process Communication?
9. Why CPU scheduler is needed in Operating system? Also explain the role of dispatcher.
10. What are various criteria to be considered when scheduling is performed?
11. Write Short Note on following Scheduling:
    a) FCFS(First Come First Serve)
    b) Preemptive SJF(Shortest Job First)
    c) Non-Preemptive SJF(Shortest Job First)
    d) Round Robin
12. Suppose a system having five processes with following information.

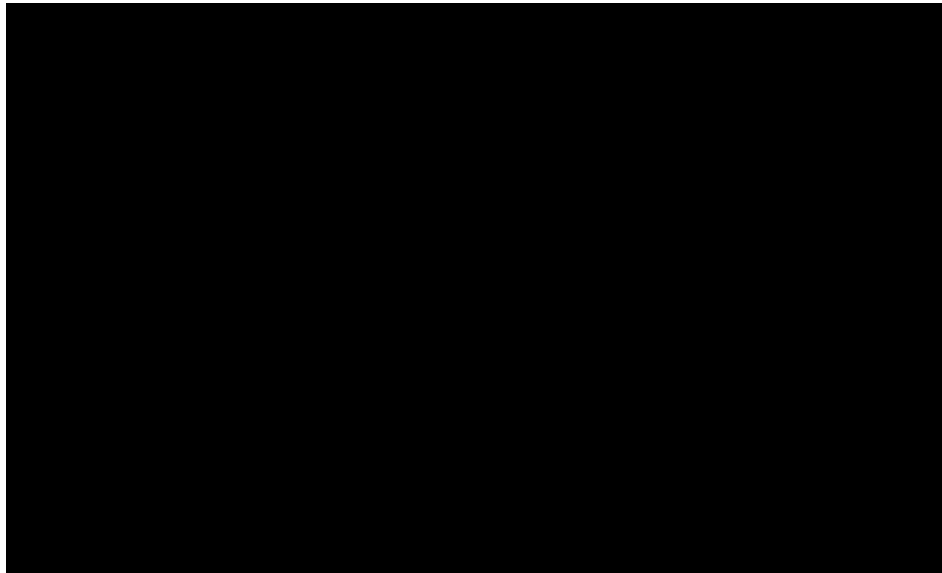| Process Burst	Arrival Time	Burst Time
P1	0.0	8
P2	2.0	2
P3	0.0	1
P4	3.0	4
P5	1.0	3

Calculate Waiting time for each process, Average waiting time and also draw the Gantt chart for scheduling of process of following schemes.
   a) FCFS
   b) Preemptive SJF
   c) Non-Preemptive SJF
   d) Round Robin (quantum=2)

13. Explain the concept of priority scheduling in detail.
14. What do you understand by Multilevel Queue?
15. Explain the concept of Multilevel Feedback queue.

UNIT – 2

16. What do you understand by critical section problem? Explain with suitable example.
17. Explain "Semaphore as a General Synchronization Tool".
18. Write Short note on following classical problems of synchronization:

   a) Bounded-Buffer Problem

   b) Readers and Writers Problem

   c) Dining-Philosophers Problem

19. What do you understand by Dead Lock? Explain the various conditions which may lead to a Deadlock.
20. Explain Resource Allocation Graph in detail. How it can lead to determine a deadlock.
21. How a dead lock can be prevented to enter into the system.
22. What do you understand by dead lock avoidance? Explain Banker's Algorithms in detail with suitable example.
23. How a systems can be recovered from dead lock.
24. Consider the following system

Use Banker's Algorithms to check whether this system is in safe state or not. Also state the sequence of process if it is in safe state.

Comment on following request by processes

   a) P1 (1, 0, 2)

b) P2 (0, 2, 0)

c) P3 (3, 3, 0)

25. What do you understand by Logical Addressing and Physical addressing?

26. What do you understand by Swapping? Explain Schematic View of Swapping in detail.

27. Write Short Note on following:

a) Contiguous Allocation scheme : Best Fit, Worst Fit, First Fit

b) Fragmentation

c) Paging

28. What do you understand by Paging? Explain with suitable example.

29. Explain the implementation of paging in detail.

30. Explain segmentation in detail.

31. What do you understand by Virtual Memory.? How it can be implemented by Demand Paging.

32. How a page fault is handled in demand paging.

33. What is the need of page replacement?

34. Consider the following String

reference string

7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

Perform the following page replacement algorithms with frame size of four and also compare their page faults.

a) FIFO (First In First Out)

b) Optimal

c) LRU (Least Recently Used)

35. Write short note on following:

a) Thrashing

b) Belady's Anomaly

c) Segmentation with paging

UNIT – 3

36. What do you understand by Device Management? Also explain the functions performed by it.

37. How many categories are there in system's peripheral devices? Explain each category in detail.

38. What do you understand by Dedicated Devices? List their pros and cons.

39. What do you understand by Shared Devices? List their pros and cons.

40. What do you understand by Virtual Devices? List their pros and cons.

41. Explain Disk Scheduling with any suitable algorithm.
42. Consider the following sequence

   Queue - 98, 183, 37, 122, 14, 124, 65, 67
   With Request queue 0-199 and Head Pointer at 53
   Perform the Disk Scheduling using FCFS (First Come First Serve) manner and also calculate total head movement.
43. Consider the following sequence

   Queue - 98, 183, 37, 122, 14, 124, 65, 67
   With Request queue 0-199 and Head Pointer at 53
   Perform the Disk Scheduling using SSTF manner and also calculate total head movement.
44. Consider the following sequence

   Queue - 98, 183, 37, 122, 14, 124, 65, 67
   With Request queue 0-199 and Head Pointer at 53
   Perform the Disk Scheduling using SCAN algorithm and also calculate total head movement.
45. Consider the following sequence

   Queue - 98, 183, 37, 122, 14, 124, 65, 67
   With Request queue 0-199 and Head Pointer at 53
   Perform the Disk Scheduling using C-SCAN algorithm and also calculate total head movement.
46. Write a short note on Swap-Space Management.

UNIT – 4

47. Describe File system and their attributes in detail.
48. What are the various operations performed over files?
49. Write short note on File Access Methods.
50. Explain file system structure in detail.
51. What are the various allocation methods in contrast to File System? Also list their pro and cons.
52. How free space management improves the efficiency and performance of the system.
53. What do you mean by attack? Also explain the type of attacks.
54. Write a short note on Cryptography.
55. List the advantages of Linux Operating System.
56. Compare the Linux operating system and windows operating system.

System Software Engineering (CS603)

UNIT-I

Q.1   Discuss the advantages and disadvantages of machine language, assembly language, and high level language.

Q.2   Give the internal and external representation of instruction and data.

Q.3   How to calculate the effective address in instruction? Explain the various addressing modes.

Q.4   Explain the various types of system software.

Q.5   How data are represented and stored in instruction and memory? Discus instruction formats.

Q.6   (a)   Explain levels of languages; High, Assembly and Low level.

         (b)   Explain search and data allocation structures.

Q.7   (a)   Explain different addressing modes.

         (b)   What are advantages of machine language? Discuss.

Q.8   (a)   What are differences between assembler and compiler? Explain.

         (b)   Discuss the activities and system software for program generation, translation and execution.

Q.9   (a)   Explain dynamic debugging in compiler and interpreter.

         (b)   What is phase and pass of language processor? Define term forward reference.

Q. 10   Discuss the editors for source code and object code/executable code files. Why are these editors important?

UNIT-II

Q.1   (a)   Explain the use of Assembly language and Assembler.

         (b)   Write assembly code for addition of two numbers.

Q.2 What is pass of an assembler? Explain the two passes of a two pass Assembler.

Q.3 Convert following assembly language program into machine language program using 2-pass assembler. Show the contents of data structures used also.

START	101		
READ	N		
MOVER	BREG, ONE		
MOVEM	BREG, TERM		
AGAIN	MULT	BREG, TERM	
MOVER	CREG, TERM		
ADD	CREG, ONE		
MOVEM	CREG, TERM		
COMP	CREG, N		
BC	LE, AGAIN		
MOVEM	BREG, RESULT		
PRINT	RESULT		
STOP			
N	DS	1	
RESULT	DS	1	
ONE	DC	'1'	
TERM	DS	1	
	END		

Assume your own instruction opcodes.

Q.4 For the program given in Question 3, write OPTAB, SYMTAB, LITTAB and POOLTAB;

Q.5   (a) What are the functions of the analysis and synthesis phase of the assembler?

       (b) Write algorithm for Pass-1 of a 2-pass assembler.

Q.6   An assembler provides a user option by which it prints separate list of the following:

       (i) Labels of instruction

       (ii) Labels of DC statements

       (iii)Label of DS statements

       Would you recommend use of single symbol table or three different symbol tables for this purpose? Justify your answer.

Q.7   Discuss a single pass assembler for Intel 8088 processor used in the IBM-PC.

Q.8   Write short notes on:

       (i) Lexical, Syntax and Semantic Analysis.

       (ii) Software tools

       (iii) Symbol tables.

Q.9   Explain pass structure of assembler.

Q.10   (a) What are the functions of the analysis and synthesis phase of the assembler?

       (b) Discuss how to resolve the forward reference problem in designing of single pass assembler.

Q.11   (a) What do you mean by assembler directives?

       (b) Describer instruction format of arithmetic and control transfer statement.

UNIT-III

Q.1   (a) Define Bootstrap, absolute and re-locatable loaders.

       (b) Differentiate between loader and linker.

Q.2   (a) A programmer loads a successfully compiled program to run it but forgets to use one system software package. When it runes the program, he finds errors when program tries to generate graphics indicating that graphic file from library is missing. Which package is missing? Explain this package in detail.

(b) Explain Relocatable loader.

Q.3   (a) What is a loader? Compare the COM files in MS DOS with OBJ and EXE
          files.

       (b) Discuss case study of MS-DOS Linker.

Q.4   Explain the design of bootstrap, absolute and relocatable loaders.

Q.5   Explain the algorithm for pass 2 of a linking loader.

Q.6   What is assembler? Explain the difference between one pass assembler and multi pass
       assembler.

Q.7   Write a assembly code for addition of two no. and explain features of assembler.

Q.8   (a) What do you mean by relocatable loader? Explain with example.

       (b) Explain design of linker.

Q.9   What is an external reference? How the external symbols are resolved?

Q.10   (a) What is relocation factor (RF)? How it is important to reallocate a program?

       (b) Consider the following program; reallocate it at the address 900.

Statement		Address	Code
START	500		
ENTRY	TOTAL		
EXTRN	MAX, ALPHA		
READ	A	500)	+ 09 0 540
LOOP		501)	

.

```
          .

          MOVER     AREG, ALPHA     518)          + 04 1 000

          BC        ANY, MAX        519)          + 06 6 000

          .

          .

          BC        LT, LOOP        538)          + 06 1 501

          STOP                      539)          + 00 0 000

A         DS        1               540)

TOTAL     DS        1               541)

          END
```

UNIT-IV

Q.1   (a) Compare and contrast the properties of macros and subroutines with respect to the following:

    (i) Code space requirements

    (ii) Execution speed.

    (iii)Processing required by the assembler.

    (iv)Flexibility and generality.

   (b) Describe various models of a macro assembler.

Q.2   Write an algorithm for a two pass macro processor in which all macro definitions are processed in the first pass, and all macro invocations are expanded in the second pass. You do not need to allow for macro definitions or invocation with in macros.

Q.3   Explain the pass structure and design of microprocessor and macro assembler.

Q.4   (a)   What is Macro definition? Explain.

(b)   What are unique labels and conditional expansion of machine independent features?

Q.5   (a)   Differentiate between microprocessor and macro assembler.

(b)   Explain machine independent features: Nesting, recursion and parameter.

Q.6   Discuss how macros are defined, called, and expanded with example.

Q.7   Discuss the data structure (MNT, MDT, etc) which are used while macros processing.

Q.8   What is conditional expansion of macros? Discuss various conditions with example.

Q.9   How the external variables are processed in macros? Explain with example.

Q.10   How the parameters are passed in macros calling? Discuss the various types of parameters and their passing methods.

UNIT-V

Q.1   What are the fundamental constituents of a HLL programming language grammar? Give a complete grammar for an arithmetic expression containing operators +, −, *, |.

Q.2   (a) What is an overlay structured program? Explain execution of an overlay structured program.

(b) What is lexical ambiguity? How it is resolved explain?

Q.3   (a) Describe language processing activities.

(b) What is ambiguity in grammatical specification? Suggest a way to eliminate it.

Q.4   For a given expression a + b * c, write down the algorithm to parse it. The grammar is given as:

$$E := T + E/T$$

$$T := V * T/V$$

$$V := <id>$$

Also write prediction table using top down parsing.

Q.5   Explain the machine dependent and independent compiler features.

Q.6   (a)   What is parsing? Explain.

       (b)   Explain lexical analysis.

Q.7   What is symbol table management? Explain the working of symbol table management.

Q.8   Discuss how to design symbol table and explain various data structure used.

Q.9   Explain classification of tokens.

Q.10   Write short note on

   (a) parse trees   (b) overflow technique
   (c) Operator precedence parsing (d) lexical ambiguity

INFORMATION THEOTY AND CODING(CS604)

UNIT-I

Que. 01. (a) What do you understand about the information? How it is measured?

(b) Define Entropy. Under what condition, is maximum entropy achieved? Obtain the value of maximum entropy for a binary system.

(c) A source emits one of four symbols x_1, x_2, x_3, and x_4 with probabilities 1/3, 1/6, ¼, and ¼, respectively. The successive symbols emitted by the source are statistically independent. Calculate entropy of the source.

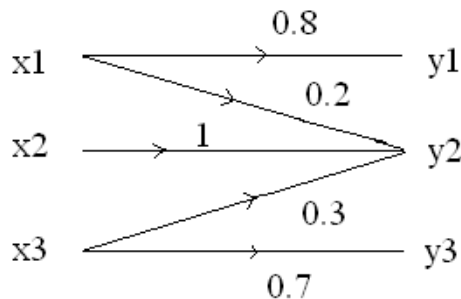**Que. 02.** A high resolution Black & White TV picture consist of $2*10^6$ picture elements and 16 brightness levels. Pictures are repeated at 32 pictures/second. All picture elements are assumed to be independent and all levels have equal probability of occurrence. Calculate average rate of information produces by TV picture source?

Que. 03.

(a) What is entropy? Prove that:

$$H(X, Y) = H(X/Y) + H(Y) = H(Y/X) + H(X)$$

(b) Find the mutual information of the given channel if $P(X) = [0.3, \ 0.4, \ 0.3]$

Que. 04. A transmitter has an alphabet of four letters $[x_1, x_2, x_3, x_4]$ and the receiver has an alphabet of three letters [y_1, y_2, y_3]. The joint probability matrix is

$$P(X, Y) = \begin{array}{c|ccc} & y1 & y2 & y3 \\ \hline x1 & 0.3 & 0.05 & 0 \\ x2 & 0 & 0.25 & 0 \\ x3 & 0 & 0.15 & 0.05 \\ x4 & 0 & 0.05 & 0.15 \end{array}$$

Calculate all the entropies.

Que. 05. (a)An event has six possible outcomes with the probabilities $p_1=1/2$, $p_2=1/4$, $p_3=1/8$, $p_4=1/16$, $p_5=1/16$.

Find the rate of information if there are 16 outcomes per second.

  (b) A discrete memory less source has an alphabet of five symbols with there are given by,

  [X] = [X1, X2, X3, X4, X5]

  [P] = [0.45, 0.15,0.15,0.10,0.15]

Compute Entropy & second order Extension for the Symbol. Find the amount of Information gained by observing the source.

Que. 06.

 (a) What do you know about information rate of source?

 (b) A discrete source emits one of 5 symbols every millisecond. The symbol probabilities are ½, ¼, 1/8, 1/16, 1/16 respectively. Calculate Entropy H and information rate R.
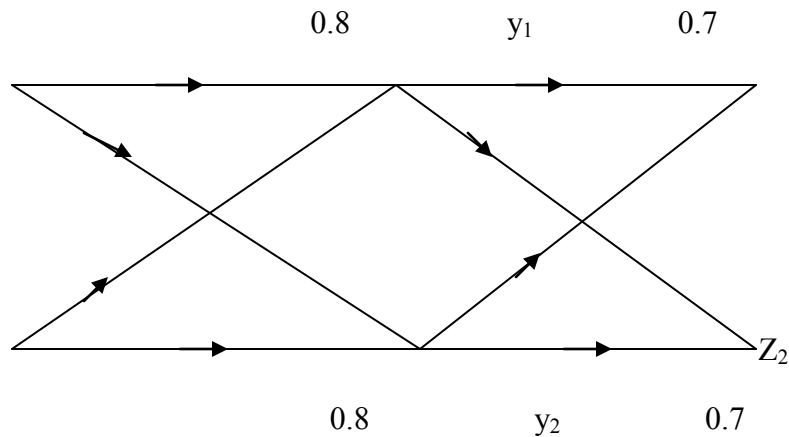
 (c) Write short note on mutual information?

Que. 07. Define the following and list their important properties:

   (i) Information

   (ii) Entropy

Que. 08. Two binary symmetric channels are connected in cascade form as follows: -

	0.8	y_1	0.7

Z_2

	0.8	y_2	0.7

(i) Find P(z1) and P(z2) if P(X) = [0.6 0.4].

(ii) Find overall channel matrix and channel diagram.

Que. 09. Explain briefly discrete memoryless channels.

Que. 10. Write short note on continuous channel.

UNIT-II

Que. 11. Give the statement of Shannon Hartley Theorem and explain it.

Que. 12. For Gaussian channel bandwidth is 5k Hz and a message is being transmitted with R = 10^6 bits/sec., find S/N for R < = C

Que. 13. What do you understand by bandwidth S/N trade-off.

Que. 14. Derive an expression to define channel capacity of Gaussian channel.

Que. 15. A Gaussian channel has 1M Hz bandwidth. Calculate the channel capacity if the signal power to noise spectrum density ratio (S/ή) is 10^5 Hz. Also find the maximum information rate. [N = ήB]

Que. 16. Give the implication of Shannon Hartley Theorem.

Que. 17. An Analog signal has a 4KHz bandwidth. The signal is sampled at 2.5 times the Nyquist rate and each sample is quantized into one of 256 equally likely levels. Assume that successive sample are statistically independent.

1. What is the information rate of this source?
2. Can the output of this source be transmitted without error over an AWGN channel with a bandwidth of 10k Hz and S/N ratio is 20 dB?
3. if answer NO for part 2, then find S/N ratio required for error free transmission for B=10k Hz.

Que. 18. Calculate the capacity of a Gaussian channel with a bandwidth B = 1MHz and S/N ratio is 30dB.

Que. 19. A Television transmission requires 30 frames of 300,000 pictures elements each to be transmmited per second. Estimated the theoretical bandwidth of the AWGN channel if the SNR at the receiver is required to be at least 50dB. Each of the elements can assume to brightness levels with equal probability.

Que. 20. For a signal the bandwidth is 3KHz and S/N ratio is 15. Calculate the channel capacity

UNIT-III

Que. 21. A Discrete Memoryless Source X has five symbols x_1, x_2, x_3, x_4, and x_5 with $P(x_1)$ = 0.4, $P(x_2)$ = 0.19, $P(x_3)$ = 0.16, $P(x_4)$ = 0.15, and $P(x_5)$ = 0.1

(a) Construct a Shannon-fano code for X, and calculate the efficiency of the code.

(b) Repeat for the Huffman code and compare the result.

Que. 22. Explain the types of errors that occur during data transmission and the methods suitable to minimize each of them.

Que. 23. For controlling the error, the parity check bits are appended (channel coding) so is it extra overhead? Justify your answer.

Que. 24. Explain types of error.

Que. 25. Explain error controlling methods.

Que. 26. Explain various types of codes.

Que. 27. A DMS having 6 messages with probability 0.30, 0.25, 0.12, 0.08, 0.05, 0.20. Find H(x)

Que. 28. Apply the Shannon fano coding procedure for the given message.

[X] = {x1, x2, x3, x4, x5, x6, x7}

P[X] = { 0.4, 0.2, 0.12, 0.08, 0.08, 0.08, 0.04}

Que. 29. Construct the Huffman codes for following set of given messages.

   [X] = {x1, x2, x3, x4, x5, x6, x7}

   P[X] = { 0.4, 0.2, 0.12, 0.08, 0.08, 0.08, 0.04}

Compare the result with Shannon-fano method.

Que. 30. What do you understand about coding efficiency of an encoding algorithm?

UNIT-IV

Que. 31 The generator polynomial of a (7, 4) cyclic code is defined by $g(x) = 1+x+x^3$. Develop the encoder

 (a) Show the contents of shift register in the encoder for a set of input sequence 1011.

Que. 32 The generator matrix for a (6, 3) linear block code is

$$G = \begin{bmatrix} 1 & 0 & 0 & : & 0 & 1 & 1 \\ 0 & 1 & 0 & : & 1 & 0 & 1 \\ 0 & 0 & 1 & : & 1 & 1 & 0 \end{bmatrix}$$

 (a) Find out the codeword for message block 100 and 010.

 (b) Find the location of error in receive vector R 011101.

Que. 33 For a (6, 3) linear block code, the three parity check bits C_4, C_5, and C_6 are formed from the following equations: -

   $C_4 = d_1 + d_3$

   $C_5 = d_1 + d_2 + d_3$

   $C_6 = d_1 + d_2$

   Where d_1, d_2, d_3 are data bits. Construct generator matrix G.

Que. 34 The generator polynomial of a (6. 3) cyclic code is $g(x) = 1+x^2$ .Find the systematic code words for data words 110, 101.

Que. 35 Design a syndrome calculator for a (7, 4) cyclic code is generated by $g(x) = 1+x+x^3$. Evaluate the syndrome for receiving sequence 1001101. (Show the contents of shift register)

Que. 36 Construct a systematic (7, 4) cyclic code using the generator polynomial $g(x) = x^3+x+1$. What are the error correcting capabilities of this code? Construct the decoding table. If the received word is 1101100, determined transmitted data word.

Que. 37 Compare linear block code and binary cyclic code.

Que. 38 The generator matrix for linear block code is

$$G = \begin{bmatrix} 1\ 0\ 0\ 0\ 1\ 1\ 1 \\ 0\ 1\ 0\ 0\ 1\ 1\ 0 \\ 0\ 0\ 1\ 0\ 1\ 0\ 1 \\ 0\ 0\ 0\ 1\ 0\ 1\ 1 \end{bmatrix}$$

(i) Find out the codeword for message block 1110.

(ii) Decode the receive vector R 1001001

Que. 39   (b) Write short note on following: -

(i)   Systematic code
(ii)   BCH code
(iii)   Non systematic code
(iv)   Huffman code

Que. 40 Explain cyclic code and its generation.

UNIT-V

Que. 41 Explain sequential decoding of convolutional codes.

Que. 42 Explain encoding in convolution codes.

Que. 43 Write short note on any two: -

(i) Constraint length
(ii) Viterbi Decoding
(iii)Transfer function
(iv)Sequential decoding

Que. 44 Explain the importance of tree diagram of convolutional codes.

Que. 45 Explain sequential decoding of convolutional codes.

Que. 46 Define Burst error. Why does it occur and how is it different from random error? Explain burst error   correcting method.

Que. 47 A convolutional encoder has three shift register, two modulo-2 adders and an output multiplexer. The generators of the encoder are as follows:

$g^{(1)} = (111)$, $g^{(2)} = (101)$

   (1) Sketch the block diagram of the encoder.
   (2) For the message sequence M=10110 find convolutional code.

Que. 48 Convolutional code is better code as compared other error controlling code. Comment on this.

Que. 49 Consider a suitable (2, 1, 2) convolutional encoder. Draw the state and trellis diagram.

Que. 50 Explain encoding in convolution codes with suitable example of encoder.

Advanced Data Structure (CS605)

UNIT-1

1   (a)   What is a weighted balanced tree? Explain the various operations on Weighted Balanced Tree.

(b)   What is the difference between a 2-3 tree and Red black tree?

2   Write short note on:

(i)   Priority Queues

(ii)   Operations on Disjoint sets

3. Explain the deletion cases in Red-Black Trees ?

4. Describe the Augmenting red black tree briefly.

5. Describe the Operations on Disjoint sets.

6.   (a)   What is Huffman Tree? Give an example.

(b)   Explain the various operations performed on disjoint sets.

(c)   What is binary tree? Give an example of Red-Black tree?

7.   (a)   What do you mean by priority queue? Give an example.

(b)   How can we elucidate concatenable queues using 2-3 trees?

8. Explain the Disjoint sets union-find problem Implementing Sets

9. What is **priority queue**? How can **priority queues** be implemented Explain?

10. What are the difference between ascending **priority queue** and descending **queue**? What are **priority queues** in c programming?

UNIT2

11. What is 2-3-4 trees and 2-3-4 heaps. Explain with examples.

12. Explain the terms:-

    (i) Implementing a Fibonacci heap

    (ii) Binomial trees

13. (a) What is Binomial Heap? Explain the different operations performed on Binomial Heap.

    (b) Explain the difference between 2-3-4 Heap and Mergeable Heap

14. (a) Discuss a suitable method for implementing Fibonacci Heap.

    (b) Explain the structure and potential of Fibonacci Heap.

15. Array implementation of **priority queue**? Describe Priority Queues using 2-3 Trees.

16. What do you understand by Mergeble Heap? Expalin Mergeble Heap Operations?

17. Implement the Binomial Heaps and its Operations with suitable example? Differentiate the 2-3-4. Trees and 2-3-4 Heaps.

18. Explain Structure and Potential Function of Fibonacci Heap. Implement Fibonacci Heap.

19) Explain heap sort with example?

UNIT-3

21. (a) Define Isomorphism. How can two graphs be isomorphic illustrate with an example?

    (b) Explain Cut sets and Cut Vertices?

22. Explain the following:-

    (i) Dual graphs   (ii) Spanning Trees

23. Fundamental Circuits of Isomorphism Components

24. Explain Cut-sets in graph theory? Explain Cut-Vertices n graph theory?

25.   a)   What do you mean by Isomorphism? Explain different components of it.

     (b)   Discuss the properties of cut sets.

26.   (a)   What do you mean by Spanning Tree? Explain different properties of it.

     (b)   What is fundamental circuit? Differentiate between Planer Graph and Dual Graph?

27. Explain minimum cost Spanning Trees ? Explain minimum cost Spanning Trees algorithms ?

28. Describe the Kuratovski's two Graphs problem. Explain prims algorithms for minimum cost Spanning Trees.

29. Explain kruskals algorithms minimum cost Spanning Trees .

30. Differentiate the prims algorithms and kruskals algorithms minimum cost Spanning Trees .

Unit IV

31. Explain the terms:-

     (i)   Min Cut Max Flow
     (ii)   Strongly Connected Components and Articulation Point

32.   Explain depth first search and Spanning trees?

33.   (a)   Explain breadth first search.

     (b)   What do you mean by single source shortest path?

34.   Explain Ford-Fulkersion Max Flow algorithm.

35.   Explain the method of finding all spanning tree in a weighted graph.

36.   (A)   Explain depth first search.

(B)   Explain Topological sort.

37. What are the randomized algorithms? What are the advantages using this concept?

38. Explain Randomized algorithm for Min cut.

39. Explain Warshall's shortest path algorithm with example.

40. Explain the flow network and augmenting paths?

Unit V

41. Explain Number theoretic notation and Chinese Remainder Theorem.

42.   Explain the terms:-

   (i) Division Theorem   (ii)   GCD Recursion

43. Write short notes on:

       (i)   Primality testing

       (ii)   Min-cut Max-flow theorem of network flows

       (iii)   Kuratovski's two graphs

44.   (a)   Explain Chinese remainder theorem.

       (b)   Explain Division theorem.

45. What is the use of cook's theorem? Prove it with example.

46. Define the terms P, NP, NP Complete and NP hard problems

47. Explain set cover problem in detail?

48. Assuming 3- CNF satisfiability problem to be NP-Complete, prove that clique problem is also NP-complete problem.

49. Explain Vertex covers and set cover problem is NP-Complete problem.

50. Prove that TSP problem is NP –complete problem. Explain the relation between NP,NP-Complete , NP-hard problem

Multimedia System (CS 606)

UNIT-1

Q.1   What is multimedia? Explain different types of medium.

Q.2   Explain properties of multimedia system?

Q.3   What is traditional data stream? Explain it's characteristics also.

Q.4   Describe Data stream Characteristics for Continuous Media?

Q.5   Explain in brief:

a)Information Units

b)Data Stream

Q.6   Write short note on:

   a) Representation Dimensions

   b) Information exchange medium

Q.7   Differentiate between Asynchronous Transmission mode and synchronous mode.

Q.8   What is the importance of multimedia system?

Q.9   Write short note on:

   a) Representation medium

   b) Transmission medium

Q.10   Explain:

   a) Presentation medium

   b) Storage medium

UNIT-2

Q.1   What is MIDI? Explain MIDI interface Component?

Q.2   Explain different devices of MIDI.

Q.3   Write short note on:

   a) MIDI software

   b) MIDI Devices

Q.4   Explain in brief:

   a) Speech generation

   b) Speech analysis

   c) Speech Transmission

Q.5   What do you understand by Digital image representation?

Q.6   Explain:

     a) Image format

     b) Graphics format

Q.7   What is Computer image processing?

Q.8   Explain Image synthesis. And why it is used?

Q.9   Describe Image analysis, why it is important?

Q.10   What is Image Transmission? How it is differ from Speech transmission?

UNIT-3

Q.1   What do you mean by Animation? Explain computer based animation?

Q.2   Explain:

     a) JPEG

     b) MPEG

Q.3   Explain CD- ROM technology in detail.

Q.4   What is Compact disk digital audio.

Q.5   Explain:

     a) Visual representation of video

     b) Transmission of video

Q.6   Explain Digitization of Video in brief.

Q.7   Explain Computer video format?

Q.8   Write short note on Animation Languages.

Q.9   Explain methods of Controlling Animations.

Q.10   Explain Display of animation in brief.

UNIT-4

Q.1   Explain Characteristics of Real Time System.

Q.2   What are the requirements of Resource management?

Q.3   Explain Component and phases of Resource management.

Q.4   What is Rate monotonic algorithm, explain it.

Q.5   Describe earliest deadline first algorithm in detail.

Q.6   Explain real time Process Management in Conventional Operating System with example.

Q.7   Write short note on Real-time Processing Requirements.

Q.8   Estimate process utilization by using EDF and Rate Monotonic.

Q.9   Explain System model of Real- Time scheduling.

Q.10   Explain different algorithm used in multimedia file system.

UNIT-5

Q.1   What is synchronization? Why it is important in multimedia system.

Q.2   Differentiate between Intra object synchronization and inter synchronization.

Q.3   Write short note on:

     a) Live synchronization

     b) Synthetic synchronization

Q.4   What is Lip Synchronization Requirements? Explain in detail.

Q.5   Discuss Pointer Synchronization requirements.

Q.6   Explain Elementary media synchronization in detail.

Q.7   Explain different layers of Synchronization Reference Model.

Q.8   Write short note on:

     a) Content Relation

     b) Spatial Relation

Q.9   Explain presentation requirement of synchronization.

Q.10   Explain function of Stream layer and Object layer.

C# and .Net Programming (CS701)

Unit-I

Q.1 What is .Net framework? Explain architecture of .Net framework.

Q.2 How .net framework supports multiple languages? Explain the various features of .net framework.

Q.3 What are the advantages of .net technologies, how it helps to make your life as developer easier?

Q.4 What is the MSIL in .NET? Describe the important features of MSIL.

Q.5 Explain the Following:

a) CLS   b) Namespaces   c) Boxing and Unboxing   d) CTS

Q.6   (a)   Discuss the Assemblies. Discuss how .Net platform answers to DLL hell problem.

     (b)   Describe Global Assembly Cache.

Q.7 Describe the structure of a C# Program with proper code-structure. Explain the jump statements available in C#.

Q.8   (a)What is the concept of Parameter Array in C# Give a code to explain.

      (b)Preprocessor Directives in C#.

Q.9 What type of applications can be created using .Net technologies? What is the web services?

Q.10 Describe the features of Visual Studio2008.Give the steps to create a simple window application.

Unit-II

Q.1   (a)What are the access-specifiers available in C#?

      (b)What is the bitwise operator in C#. Explain the steps of left shift operator for
Following.   Int a= -2;

         a=a<<4;

Q.2 What are constructors and destructors in C#? Give an example that contains each type of constructor.

Q.3 What is argument passing mechanism in C#? Explain out and ref parameters with example.

Q.4 Write Short Notes on the Following:

(a)Foreach Loop (b)Jagged Array (c) this Variable

(d) Reference Types and Value Types

Q.5(a) What is the difference between string class and stringbuilder class?

(b) Explain the following methods of string class with example :

(1)Join(string,object[ ])

(2)Trim(string),TrimStart(),TrimEnd()

(3)split(char[ ],Int32)

Q.6 What is the Object Class in .Net, Explain the System.Object Methods.

Q.7 (a) What is the partial class in C#.

(b)What are the differences between Class and Structure?

Q.8 Explain the followings:

(a) readonly fields (b) nullable Types (c) static constructor

Q.9 What is the Enumeration in C#,what are the benefits to use Enum? Write code to define a enumeration to specify days of week and print the days using associate numeric values.

Q.10 what is the operator overloading? Explain the following operators:

(a) Is operator (b)As operator (c) sizeof (d) typeof operator (e)Null Coalescing

Unit-III

Q.1 (a)What do you mean by structured error handling?

(b)How Try…Catch…Finally statement is executed? Explain in brief with example.

Q.2 Explain delegates and events with proper example. Also write differences in these two.

Q.3 What is the exception How exception handling is done in C#. Which Predefined classes are provided in .Net?

Q.4 Write a program in C# to implement explicit interface implementation?

Q.5 Write Short Notes on the Following:

      (a)Sealed class and Methods   (b)DataReader Object

      (c)Dataset   (d)ExecuteNonQuery Method

Q.6   (a)What is the Abstract Class and Methods.

      (b)Write a program to explain constructor invocation in inheritance.

Q.7 Distinguish between ADO and ADO.NET .
Q8 write a simple Windows Login Application & give the process of creation?

Q.9 How data is accessed with ADO.NET? Give the code of connection string to connect with MS access database.

Q10 write the code in C# to update the Employee city of Employee-table in EMP database using Command Object.

Unit-IV

Q.1 Describe the page life cycle in ASP.Net page.

Q.2 What is the web Application? Describe the various steps involved in designing and hosting web site.

Q.3 What is Master Page, what are the advantages? Give ASP.Net code to demonstrate the usage of nested master page.

Q.4 what is the use of validation control in ASP.NET explain different types of validation control of ASP.net.

Q.5   (a)   Differentiate between ASP and ASP.Net.

      (b)   What is Theme? Differentiate between CSS and skin file. Give ASP.Net code to define theme and also give code to apply it in webpage.

Q.6 Write short Notes on the following:

       (a) Web Parts   (b)Web config File   (c)File Upload Control

       (d)Postback   (e)Viewstate

Q.7 What is the Asp.Net? Explain the server controls available in ASP.Net.

Q.8 What is Website? Write a designing step to create a sample website.

Q.9. Explain the login web Server Control.

Q.10.Explain the Site Navigation Controls of Asp.Net.

Unit-V

Q.1. Discuss the concept of Thread in c#. Describe Multithreading with examples.

Q.2 (a) What do you mean by Type Discovery? Explain

       (b) What is the reflection in .Net.

Q.3 what is the assemblies and it types, explain. What is the versioning? Which utility is used to see the assembly of an application?

Q.4.What is the Manifest?what is the concept of strong name,how can DLL hell problem is solved out in .NET?

Q.5.Write Short Notes on the Following:

(a)Marshaling (b)Client Activation Object (c)Reflection (d) Remoting

Q.6 Discuss the concept of Thread in c#. Describe Multithreading with examples.

Q. 7 What is the CLR in .Net Framework? What are the responsibilities of CLR.How Garbage collection is done,

Q.8. In .Net Remoting what all channels are provided in .net base class library?

Q.9.What is the .Net REMOTING. Explain the Remoting –Architecture in .net framework.

Q.10 What is the marshaling? Explain the singleton and singleCall type.

Artificial intelligence (CS702)

UNIT – 1

1. Explain the characteristics of Production Systems?

2. Describe the water-jug problem using production rules.

3. Explain the best first search based A* algorithm with example.

4. Explain the hill-climb method with different limitations using suitable Examples.

5. Explain the BFS with advantages and disadvantages.

6. Explain the best first search based AO* algorithm with example.

7. Explain the DFS with advantages and disadvantages.

8. What do you understand by artificial intelligence?

9. Explain the Production Systems?

10. Explain the control strategies in search techniques?

UNIT – 2

11. Represent the following facts in predicate logic:

    a) Spot is a dog.
    b) Spot has a tail.
    c) All dogs have tails.
    d) Marcus was a man.
    e) Marcus was a Pompeian.
    f) All Pompeians were Romans.
    g) Caesar was a ruler.
    h) All Romans were either loyal to Caesar or hated him.
    i) Everyone is loyal to someone
    j) People only try to assassinate rulers they are not loyal to.
    k) Marcus tried to assassinate Caesar.

12. Describe all the different approaches for Knowledge Representation.

13. Compare the propositional and predicate logic?

14. Explain the Resolution in knowledge representation.
15. Explain the non monotonic reasoning in knowledge representation.
16. Explain the monotonic reasoning in knowledge representation.
17. Explain the backword chaining algorithms?
18. Explain the Resolution for first order logic or inference rule?
19. Prove by resolution(any pbm).
20. Illustrate the first order logic in knowledge representation?

UNIT – 3

21. Explain the Baye's theorem ?
22.Explain how Bayesian statistics provides reasoning under various kinds of uncertainty.

23. Construct semantic net representations for the following.

• pomepeian (marcus), blacksmith(marcus)

• mary gave the green flowered vase to her favorite cousin.

24.construct partitioned semantic net representations for the following :

• every batter hit a ball

• all the batters like the pitcher

25. Give the semantic representation of "john loves Mary".

26. Describe about the frames with example.

27. Describe about the fuzzy logic?

28. Elaborate forward and backward chaining.

29. Explain the probabilistic reasoning with reference of AI.
30. Elaborate conceptual dependency.

UNIT – 4

31. Explain min-max search procedure?

32. Describe alpha-beta pruning and give the other modifications to the minmax procedure to improve its performance.

33. How searching is used to provide solutions and also describe some real world problems?

34. Describe alpha-beta pruning and its effectiveness.

35. Define planning with reference of AI.

36. What are the features of an ideal planner?

37. What are the components that are needed for representing an action?

38. Define natural language processing.

39. Explain the block world problem in robotics?

40. Write in detail about any two informed search strategies?

UNIT – 5

1) Explain the various forms of learning.

2) How is the learning process in a decision tree?

3) What are the various methods of logical formulation in logical learning?

4) How are explanation based learning done?

5) Elaborate upon inductive logic programming.

6) Write in detail about the Expert system.

7) Give an overview of a neural network.

8) Explain multilayer feed forward neural networks with an algorithm ?

9). Explain the nonparametric learning methods.

10) How learning is done on a complete data using statistical methods?

Subject: Simulation and Modeling (CS704)

Unit-I

1. What is simulation? List a few advantages and disadvantages of simulation.
2. Differentiate between
   a. Deterministic and Stochastic activities
   b. Static Physical Models and Dynamic Physical Models
   c. Static Mathematical Models and Dynamic Mathematical Models
3. Compare and contrast the modeling process with the scientific method: Make observations; formulate a hypothesis; develop a testing method for the hypothesis; collect data for the test; using the data, test the hypothesis; accept or reject the hypothesis.
4. Explain the following with an example: System, Entity, Attribute, Activity, and State of the system.
5. Discuss about the subtasks involved in deriving a model of the system with an example.
6. What are the major segments used in corporate model? Explain each segment.
7. Discuss various application areas of simulation system.
8. Name several entities, attributes, activities, events and state variables for the following system: (a) A cafeteria (b) A grocery Store (c) A Fast food restaurant (d) A hospital Emergency room (e) Automobile assembly room
9. What is model? Explain different types of model with suitable example?
10. Explain different steps in simulation study.

Unit-II

11. What is queuing model? How it is useful for Simulation? Explain all different kind of Queuing Model in detail.
12. Explain simulation of single server queuing system for grocery store checkout Counter.
13. Explain simulation of inventory system
14. Discuss the advantages of system simulation. Explain real time simulation and hybrid simulation giving some examples.
15. Write short notes on
    a. Monte –Carlo methods
    b. Numerical Computation Techniques

c. Distribute lag model

16. What do you mean by system modeling? Write difference between continuous and Discrete Systems

17. Arrivals at a Bank teller's cage are poisson distributed at the rate of 1.2 per second.

    a) What is the probability of zero arrivals in the next minute?

    b) What is the probability of zero arrivals in the next two minutes?

18. Explain Poisson distribution Technique?

19. What are important methods for generating random numbers? Explain rejection method and inverse transformation method. What are the differences between the above two methods?

20. (A) What is an entity? What are different types of entities of a simulation system?

    (B) Compare and contrast the differences between permanent and temporary entities.

Unit-III

21. What is discrete system simulation? Explain with an example.

22. Mention properties of random nos. and give the methods of generating Pseudo Random nos.

23. Discuss the merits of analog and digital simulation of continuous systems. Apply these techniques to simulation of water reservoir system.

24. Describe the various techniques of discrete system simulations. Describe the ways of generating non-uniformly distributed random numbers. Discuss in brief the tests for randomness.

25. The customer arrival process at a particular store is exponentially distributed with a mean arrival rate of 3 customers per hour. No customers have arrived in the last 5 hours. How many customers are expected to arrive in the next hour?

26. A certain college has 5 printers in the computer room for the use of the college's 1500 undergraduate and 2000 graduate students. Print jobs arrive uniformly during the day and have an exponentially distributed page count. They are spooled on a single hard disk while waiting for the first printer to be available. In the standard notation of queuing systems, how would this queuing system be characterized? (e.g., as an M/M/1 queue? Or some other type?)

27. In a chemical reaction one molecule of a substance X is produced for one molecule each of substance A and B. The initial concentrations of A and B are a and b, respectively. Let x be the concentration of X and assume that it is initially zero. The are at which x increases is 0.1 times the product of the current concentration of A and B. Assume a and b initially 0.8 and 0.4, respectively, simulate the production of X.

28. What are important methods for generating random numbers? Explain rejection method and inverse transformation method. What are the differences between the above two methods?

29. Explain the simulation of servo system.

30. Explain the simulation of fixed time step and event to event model.

Unit-IV

31. Describe the exponential decay model with help of real world examples.

32. Describe logistic curves and their usage.

33. Explain system dynamics model with example of world model.

34. Discuss the advantages of feedback in socio-economic systems in detail.

35. Describe exponential growth models and fixed time step model.

36. What is world model? Explain.

37. Two companies invest funds in capital equipment to improve their positions. The rate at which each invest funds decreases linearly as their own investment increases but increases linearly as their competitor's investment increases. Draw a diagram from which to simulate the competition and determine under what conditions the investments will stabilize.

38. Describe the system dynamic for multi segment model of house air conditioner sales. (assume the required entities).

39. Explain the system dynamics with an Biological Example.

40. Describe the modified exponential growth models.

Unit-V

41. Write short notes on GPSS. Explain at least 5 GPSS block-diagram symbols.

42. Design a supermarket simulation model using GPSS symbols.

43. Design a Telephone System simulation model using GPSS symbols.

44. (A) Write the different techniques of simulation output analysis.

(B) What is the difference between spectral analysis and time series analysis?

45. (A) What is a regenerative technique and autoregressive means?

(B) Write a program for single server queue using any one of the simulation language you know. Give comments for each statement.

46. What is warehouse management? Explain the different factors affecting warehouse management.

47. What is project management? Discuss in detail with an example.

48. What is the Simulation language? Discuss the different kinds of simulation language.

49. Flow chart simulation language comes in which category? Give an example of it.

50. Describe the discrete and continuous simulation language with one daily life example.

51. In each of the following program blocks, find and correct the syntax errors.

    a) begin

```
integer I1.I2;
I1 := 3;
I2 := I1
OutInt(I2,4);
OutImage
```

        end

    b) begin

```
Res := 4;
integer Res;
OutInt(Res,6);
OutImage
```

        end

Visual Programming (CS705)

UNIT – 1

QUE.1) What is window programming. Explain all the data type of window programming?

QUE.2) What parameters are passes to WinMain() function & what do they signify?

QUE.3) Write a program to function overloading and function overriding using console Application.

QUE.4) What is the initial function to be called in MFC and what it will do

QUE.5)Define MFC and windows OS Interaction?

QUE.6) Write a program to **displaying the window Using message loop**

QUE.7) What is the difference between **painting and repainting?**

QUE.8) Write a program to create **child window controls using vc++.**

QUE.9)What is a multi-threaded apartment (MTA)and Single-threaded apartment (STA)in concole application.

QUE.10)What is the difference between Modal and Modeless Dialog?

UNIT – 2

QUE.1) Explain windows event driven programming model & Mapping Modes?

QUE.2) Explain all the MFC classes with example.

QUE.3) Explain all the tools of Microsoft visual c++ and also explain MFC Architecture

QUE.4) What is Window common controls? Explain all the MFC library with example.

QUE.5)What is the difference between Modal and Modeless Dialog?

QUE.6)Explain the MFC interface elements and MFC class hierarchy

QUE.7)Write a program to create a bitmaps using MFC.

QUE.8)Give an explanation about the common tools in VC++?

QUE.9)Define property sheets? How we can create property sheet, property page resources, a modeless property sheet and also how we can initialize the property page?

QUE.10)What is the difference between Event Handling and Mapping modes.

UNIT – 3

QUE.1) What is the difference between SID,MID and Dialog based application?

QUE.2) Explain Document & view Architecture?

QUE.3) Difference Between Model & Modeless Dialog Box?

QUE.4) Explain the Reusable freme windiw base class and also explain all the AFX function with example

QUE.5)Explain ADO and the advantages of ADO with example?

QUE.6)What is document-view architecture? Explain SDI and MDI?

QUE.7)What do you mean by Dialog box? What are the different types of Dialog box and explain in detail?

QUE.8)What is a DLL? What are different dll's supported in VC++? Explain different types of dll's, what is mfc extension dll, regular dll or win32 dll?

QUE.9)What is Message Maps ? Explain Property, Property page and Property sheet?

QUE.10)Explain Console application and Dialog based application and HTML application?

UNIT – 4

QUE.1)Define ActiveX data object? What are the advantages of ADO? Define Data Access Objects?

QUE.2)Define the types of DLL's? What is the difference between implicit and explicit loading of a dll?

QUE.3) How to configure the ActiveX controls? explain complete process with example.

QUE.4) What is the difference between ActiveX controls and Ordinary Windows Controls?

QUE.5) What is Component Object Model (COM) and explain aal the methods of Component Object Model (COM) with example.

QUE.6) Write a program to create a simple application of OLE drag and drop process.

QUE.7) What is the difference between aggregation Vs. inheritance?explain with example

QUE.8)What are some of the benefits that MFC offers to developers? Compare ATL vs. MFC ?

QUE.9)What is the difference between serialization and deserialization?

QUE.10) Write short note on
        a) Toolbars
        b) Bitmap
        c) GDI

UNIT – 5

QUE.1) Explain all the drivers and components of Microsoft ODBC

QUE.2) How to configure the Microsoft ODBC drivers in Win23 application?

QUE.3) Explain the MFC ODBC classes with example.

QUE.4) Write a program to filter and sort strings using database

QUE.5)Define ActiveX data object? What are the advantages of ADO? Define Data Access Objects?

QUE.6)What is the difference between Winsock and WinInet and how to use Winsock in ActiveX process.

QUE.7)What is ISAPI server extension? How to install ISAPI server extension?

Compiler Construction (CS706)

Unit I

1. Explain the following in brief:

   a. Preprocessor

   b. Assemblers

   c. Loaders

   d. Link Editors

   e. Front and back ends

   f. Passes

2. What is the difference between syntax and semantics of the languages? Explain with examples of C language.

3. Discuss the advantages and disadvantages of single and multiple compilers.

4. What is a cross compiler? Why is bootstrapping required to generate cross compiler?

5. How is Finite Automata useful for Lexical Analysis. Explain.

6. What Are the Phases of compiler? Explain the function of each phase in brief.

7. Write short notes on:

   a. Parameter passing

   b. Compiler writing tools

8. Can a compiler be implemented in its own language? Explain how.

9. (a) How is Finite Automata useful for Lexical Analysis.

   (b) What is LEX and YACC? Give Specification of LEX.

10. Discuss the functions of a compiler. Elaborate on grouping of phases in a compiler. Write down the output for the following expression after each phase a: =b*cd.

Unit II

1. Modify the following CFG so as to make it suitable for top-down parsing. Construct LL(1) parser for modified CFG. Show moves made by this LL(1) parser on input 'id+id*id'.

   $E \rightarrow E+T \mid T$

   $T \rightarrow T*F \mid F$

   $F \rightarrow (E) \mid id$

2. Construct LR parser for the following grammar:

S→aIJh

I→IbSe | c

J→kLkr | ε

K→d | ε

L→p | ε

3. Explain the significance of FIRST( ) and FOLLOW( ) with respect to top-down parsing. What is the difference between LL(1) and LR parser?

4. Show that the following grammar is LL(1) but not SLR(1)

S→Ax Ay | By Bx

A→ε

B→ε

5. Construct an SLR parsing table for the grammar

E→E sub R | E sup E | {E} | c

R→E sup E | E

Resolve the parsing action conflict so that the expressions will be parsed correctly.

6. Construct LALR parsing table for the grammar:

S→ AS | b

A→SA | b

And hence determine whether the grammar is LALR or not.

7. Compute FIRST ( ) and FOLLOW( ) and make parsing table for it:

E→E + T | T

T→T*F | F

F→(E) | id

Show the moves made by this LL(1) parser on input id+id*id.

8. (a) What is an ambiguous grammar? Give an example.

    (b) What is a shift-reduce parser? Explain in detail the conflicts that may occur during shift-reduce parsing.

9. Construct LR(1) parsing table for the following grammar:

    S→A

    A→BA | ε

    B→aB | b

    Also show the sequence of action of LR (1) parser on input aaab.

10. Obtain CLR parsing table for the following grammar :

    S→aSbS | bSaS | ε

11. Consider the following grammar

    E-> EAE | (E) | -E | id

    A-> + | - | * | / | ↑

    Show that the string -(id+id) is a sentence of above grammar. Also draw the sequence of parse trees for -(id+id).

12. Explain the various error recovery strategies that a parser can employ to recover from syntactic error.

Unit III

1.
   (a) Describe the method of generating syntax directed definition for Control statements.

   (b) Give the semantic rules for declarations in a procedure.

2.
   (a) How Back patching can be used the generate code for Boolean expressions and flow of control statements.

   (b) Explain how the types and relative addresses of declared names are computed and how scope information is dealt with.

3. Mention the steps involved in partitioning a sequence of three address statements into basic blocks.

4. Translate the following expression :

   -(a*b) * (c+d) / (a*b +c) into,

   (i) Quadruples

   (ii) Triples

   (iii) Indirect triples

5. Write quadruple, triples and Indirect triples for the following expression

   -(a+b)*(c+d)-(a+b+c)

6. Define Syntax directed definition. Explain the various forms of Syntax directed Definition.

7. Define L-attribute Definition .Construct the Parse tree for following expression 9-5+3 using following translation scheme.

   E-> T R

   R->addop T {print (addop.lexeme)}R_1 | $\in$

   T-> num { print(num.val)}

8. Explain the translation scheme of checking the types of statements.

9. Give quadruples and triples for an assignment statement a := b*-c+b*-c

10. Translate the expression – (a+b) * (a+b+c) into quadruples and indirect triples.

Unit IV

1. Comment on the use of symbol table for the compiler. What information should be associated with a symbol name in the symbol table? Describe data structures for the symbol table and compare them.

2. Explain the activation record for procedure call.

3. Explain the static allocation scheme.

4. Discuss the different symbol table organizations in compilers. Explain symbol table organizations for block structured languages.

5. What are the various attributes stored in symbol table? Discuss various structures for implementation of symbol tables.

6. What are the various runtime storage management techniques? Explain in detail with programming example.

7. Explain the storage table management system.

8. What are the different data Structures used for symbol table organization? Which Data structure provides best performance and why?

9. What are the limitations of static allocation?
10. Write a note about Data flow analysis of structural programs

Unit V

1. What are DAGs and how are they useful in implementing transformations on basic Blocks?
2. Write short notes on
    i. Advantages of DAG
    ii. Loop optimization and loop invariant computation
3. Construct the DAG and generate the code for given basic block.

    d: = b* c
    e: = a + b
    b: = b * c
    a: = e- d

4. Describe in detail the concept of Peephole optimization.
5. Write in detail the issues in the design of code generator.
6. Generate target code for the source language statement
    (a-b) + (a-c) + (a-c);

7. What are the structure preserving transformations on basic blocks?
8. Write down a detailed note on basic blocks and flowgraphs.
9. Discuss the following: i). Copy Propagation ii) Deadcode Elimination and iii) Code motion
10. Write short notes on
    i. Applications of DAG
    ii. Transformations that are characteristic of peephole optimizations.