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NH–5, Anakapalle, Visakhapatnam–531002, Andhra Pradesh
Phone: 08924-221111/221122/9963981111, E–Mail: info@diet.edu.in, Web: www.diet.edu.in

QUESTION BANK
ADVANCED DATA STRUCTURES
Class – II B.Tech (CSE-A&B) – II Sem   Name of the Faculty- K. Nuka Raju

Unit – 1
1) a) Explain the Simple External sorting Algorithm and Efficiency.
   b) Explain the above with an example list.
2) a) Explain K-way merge and its efficiency.
   b) Explain K-way merge with example elements.
3) a) Explain Buffer handling with parallel operation.
   b) Explain about Run generation
4) a) How do we get optimal merging of runs explain.
   b) Explain the above with an example list.
5) a) Explain about Run generation
   b) Explain K-way merge with example elements.

Unit -2
1) a) What is a Hashing and Explain about Hash Table
   b) Explain about Hash functions
2) a) Explain about Secure Hash function.
   b) Explain about theoretical evaluation of overflow techniques.
3) a) Explain about Dynamic Hashing .
   b) Explain the Dynamic Hashing using Directives
4) a) Explain about Directory less Dynamic Hashing.
5) b) Explain about Hash functions.

Unit -3
1) a) What is a heap? Explain the min heap with example.
   b) Explain about Binary heap structure property
2) a) Explain about heap order property.
   b) Explain Basic heap operations
3) a) Explain the applications of priority queues.
   b) What is Binomial queue explain.
4) a) What is Binomial queue explain
   b) Explain about Binomial queue operations.
5) a) Explain the applications of priority queues
   b) Explain about Binary heap structure property

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Unit – 4

1) a) What are AVL Trees. Explain the rotations of AVL trees.
   b) Construct an AVL tree with example nodes.
2) a) What are Red Black Trees. Explain
   b) Explain the insertion operation in to Red black trees.
3) a) Explain representation of Red Black trees.
   b) Explain the deletion operation in the Red Black Trees.
4) a) Explain the rotations of AVL Trees.
   b) Explain the Joining operation in Red Black trees.
5) a) Explain the operations of AVL trees implementation
   b) Explain the splitting of Red Black Trees.

Unit -5

1) a) Explain the M-way search trees.
   b) How do you perform search operation in M-Way Search Trees.
2) a) Explain about B-Trees.
   b) How do you find the number of elements in a B-Tree. Explian.
3) a) Explain the insertion operation of the B-Tree.
   b) Explain how do you perform the deletion from B-Tree.
4) a) What are B+ Trees. Explain the insertion into B+ Trees.
   b) Explain the deletion from the B+ Trees
5) a) Explain the M-way search trees.
   b) How do you find the number of elements in a B-Tree. Explian.

Unit – 6

1) a) What are Digital Search trees. Explain
   b) Explain the operations on Digital Search Trees.
2) a) What are Binary Tries. Explain.
   b) Explain the Patricia.
3) a) Explain about Mutliway tries.
   b) Explain the insertion and deletion operation in Mutliway search tries.
4) a) What is a compressed trie. Explain with an example.
   b) Explain the compressed trie with labeled edges.
5) a) Explain the tries and internet packet forwarding.
   b) Explain about fixed stride tries and variable stride tries.

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QUESTION BANK

COMPUTER ACHITECTURE AND ORGANIZATION

Class – II CSE - B – II Sem   **Name of the Faculty- K. Komali**

UNIT –I

1) a) Explain the Functional unit of a computer	- 5 M
b) Explain the Basic Operational concepts of a Computer	- 5 M
2) a) Explain about Bus structures	-5 M
b) Explain about the System Software.	- 5 M
3) a) How to calculate the Performance of a computer Explain.	- 5 M
b) Explain the history of computer development.	- 5 M
4) a) Explain the Functional unit of a computer	- 5 M
b) Explain about Bus structures	- 5 M
5) a) Explain about the System Software.	- 5 M
b) How to calculate the Performance of a computer Explain.	- 5 M

UNIT –II

1) a) Explain about the Register Transfer Notation	- 5 M
b) Explain about Assembly Language Notation	- 5 M
2) a) Explain the Basic Instruction Types	- 5 M
b) Explain the different Addressing Modes	-5 M
3) a) Explain about Basic Input/output Operations	- 5 M
b) Explain the role of Stacks and Queues in computer programming equation	- 5 M
4) a) Explain about Logic Instructions	- 5 M
b) Explain about shift and Rotate Instructions	- 5 M
5) a) Explain the Basic Instruction Types	- 5 M
b) Explain the role of Stacks and Queues in computer programming equation	- 5 M

UNIT –III

1) a) Explain about Arithmetic Instructions.	- 5 M
b) Explain about Logic Instructions.	- 5 M
2) a) Explain about Branch Instructions.	- 5 M
b) Explain about Different Addressing modes	- 5 M
3) a) Explain about Diff input output operations	- 5 M
b) Explain about Different Addressing modes	- 5 M
4) a) Explain about Arithmetic Instructions.	- 5 M
b) Explain about Branch Instructions.	- 5 M

5) a) Explain about Logic Instructions.   - 5 M
   b) Explain about Different Addressing modes.   - 5 M

UNIT –IV

1) a) Explain about Accessing I/O Devices   - 5 M
   b) Explain about Interrupt Hardware   - 5 M
2) a) How do you Enabling and Disabling Interrupts   - 5 M
   b) How do you handle Multiple Devices   - 5 M
3) a) Explain about Direct Memory Access   - 5 M
   b) Explain about Synchronous Bus   - 5 M
4) a) Explain about Asynchronous Bus   - 5 M
   b) Explain about Interface Circuits   - 5 M
5) a) Explain about Peripheral Component Interconnect (PCI) Bus   - 5 M
   b) Explain about Universal Serial Bus (USB)   - 5 M

UNIT –V

1) a) Explain about Basic memory circuits   - 5 M
   b) Explain about Memory System Consideration   - 5 M
2) a) Explain about ROM   - 5 M
   b) Explain about PROM   - 5 M
3) a) Explain about EPROM   - 5 M
   b) Explain about EEPROM   - 5 M
4) a) Explain about Flash Memory   - 5 M
   b) Explain about Mapping Functions   - 5 M
5) a) Explain about Magnetic Hard Disks   - 5 M
   b) Explain about Optical Disks   - 5 M

UNIT –VI

1) a) Explain about Register Transfers   - 5 M
   b) How to Perform Arithmetic Operations? Explain.   - 5 M
2) a) How to Perform Logic Operations ?Explain.   - 5 M
   b) How to Fetch A Word From Memory? Explain.   - 5 M
3) a) Explain Execution of Complete Instruction   - 5 M
   b) Explain about Hardwired Control   - 5 M
4) a) Explain about Microinstructions   - 5 M
   b) Explain about Micro program Sequencing   - 5 M
5) a) Wide Branch Addressing Microinstructions with next –Address Field   - 5 M
   b) Explain about Microinstructions   - 5 M

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Course : B.Tech.   **Branch :** CSE-A& B   **Year/Semester :** II/II   **Academic Year :** 2017-18

Faculty Name : B RENUKA   **Subject : FLAT**   **Admitted Batch :** 2017

QUESTION BANK

Unit I : Finite Automata

1. a. What is finite Automation and explain in detail about Acceptance of a String by a Finite
    Automation   [4 M]
    b.Construct a DFA accepting the language   [6 M]
    { W Î {a,b}* | W has neither aa nor bb as substring}

2. a. Construct a DFA to accept the language L={w/w has both an even number of 0's
    and even number of 1's}.   [5 M]
    b. Construct a DFA equivalent to the NFA given below
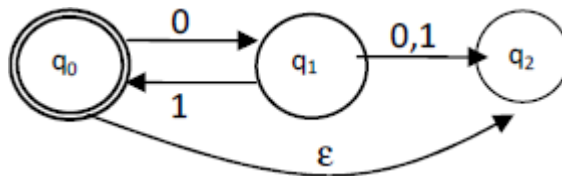
3. a. Construct an NFA that accepts the set of all strings over {0,1} that start with 0 or 1
    and end with 10 or 01.   [5 M]
    b. What is minimal DFA? Write the minimization Algorithm for DFA?   [5 M]
4. a. Construct a Deterministic Finite State Automata equivalent to the NFA given below
    M={(q0,q1,q2,q3), {0,1} , §,q0, { q3}} where _ is defined by the following transition table
   [6 M]

§	0	1
q_0	(q_0, q_1)	(q_0)
q_1	(q_2)	(q_1)
q_2	(q_3)	(q_3)
q_3	null	(q_2)

    b. Convert NFA to DFA with suitable example?   [4 M]
5. a. Design a Moore machine that accepts all strings of 0's and 1's treated as binary
    integer number return a remainder 1 when divided by 3.   [5 M]
    b. Design a mealy machine to print out 1's complement of an input bit string? [5 M]
6. a. Convert the following Mealy machine to an equivalent Moore machine   [5 M]
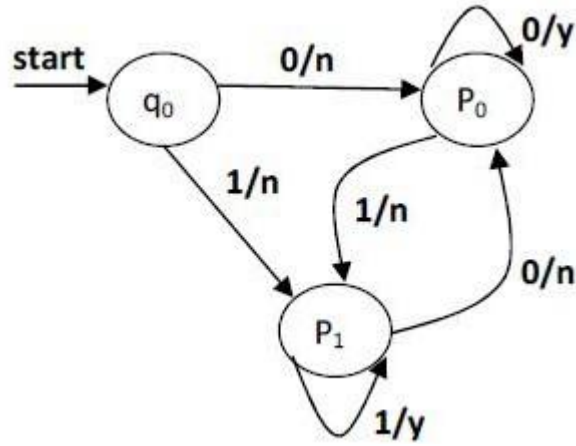
b. Reduce the DFA given below   [5 M]
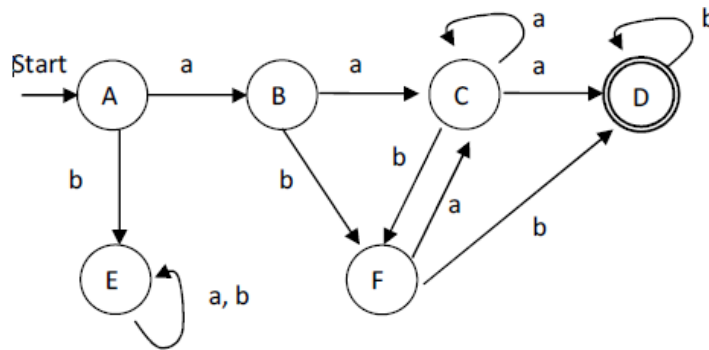
Unit II :Regular Expressions

1. a. Construct an NFA equivalent to the regular expression 1*0+1101 and (0+1)*. [5 M]
    b. Convert the following regular expression into NFA with $\in$ transition.   [5 M]
        i) 1*0+1101   ii) (0+1)*

2. a. Write the steps to construct regular expression from given DFA?   [4 M]
    b. Construct a regular expression corresponding to the DFA represented by the below transition table. q_1 is both the initial state and final state.   [6 M]

δ	0	1
q_1	q_1	q_2
q_2	q_3	q_2
q_3	q_1	q_2

3. a. Construct the regular grammar to generate the following Language L={ $a^n b^m$ | n,m >=1}
                                                                                [6 M]
    b. Prove that regular sets are closed under union and complementation   [4 M]

4. a. Define the DFA and regular expression. DFA accepts all strings corresponding to the expression 1*01(0+11)*. Also explain how to convert DFA to regular expression by eliminating states.   [6 M]
    b) Give an example to explain the Relation between Regular Grammar and Finite Automata?
                                                                                [4 M]

5. a. Construct a Non Deterministic Finite automaton (NDFA) with $\in$-moves for the regular expression (10+11)*00.   [5 M]
    b. Give the properties of regular expressions and state and prove Arden's theorem.
                                                                                [5 M]

Unit III : Context Free Grammars

1. a. What is a context free Language? Give examples? Write about the properties of
   context free languages?   [4 M]
   b. Simplify the following CFG and Convert it into CNF   [6 M]
      S -> AaB | aaB
      A -> ε
      B -> bbA | ε

2. a. Write the general procedure to transform a grammar to Greibach Normal Form?
                                                                               [5 M]
   b. Prove that S -> aSbS | bSaS | ε is ambiguous.   [5 M]

3. Remove all ∈ and unit production rules from the following CFG   [10 M]
      S →AaA/ CA/ BaB
      A →aaBa/ CDA / aa / DC
      B →bB / bAB / bb/ aS
      C →Ca / bc / D
      D →bD / A

4. a. Construct a Greibach Normal Form grammar equivalent to the following CFG[5 M]
      S→ AA / 0
      A →SS / 1
   b. Prove that the following grammar of arithmetic expression is ambiguous. [5 M]
      E→ E+E / E*E / (E) / (id)

5. a.Consider the CFG with the following production rules: [5 M]
      S →aB/ bA
      A →bAA / aS/ a
      B→aBB / bS/ b
   Give the right most derivation and draw derivation tree for the string *abbaab*
   b. Find a Greibach normal form grammar equivalent to the following CFG.   [5 M]
      S→ASB/ AB
      A→a
      B→b

6. a. Convert the following grammar into Chomsky Normal Form.   [6 M]
      S→aB/ bA
      A→bAA / aS/ a
      B →aBB / bS/ b
   b. What is pumping lema and explain with proper example?   [4 M]

Unit IV : Pushdown Automata

1. a. What is push down automata? Show how context free languages accepted by push down
   automata?   [5 M]
   b. Explain in detail about language acceptance of push down automata?   [5 M]
2. a. Explain about deterministic pushdown automata with example?   [5 M]
   b. Explain about two stack push down automata?   [5 M]
3. a. Illustrate about non-deterministic pushdown automata with example?   [6 M]
   b. Applications of pushdown automata?   [4 M]
4. a. Explain about equivalence of pushdown automata and context free grammar with example?
   b. Explain in detail about Conversion of CFG ?

Unit V: Turning Machine

1. a. Define Turing Machine and explain transition tables and transition diagrams? [4 M]
   b. Design a Turing Machine to accept the language L = {W W^R | W $\in$ (a+b)'} [6 M]
2. a. Design a Turing Machine to recognize the language L={ $1^n 2^n 3^n$ | n>=1} [5 M]
   b. Design a Turing Machine to compute Max(n_1, n_2)? [5 M]
3. a. Design a Turing machine that accepts the language L ={ WW^R / W $\in$ (0+1)* and
   W^R is reverse of W} [5 M]
   b. Design a Turing machine to accept the set of al palindrome over {0,1}*. Draw a
   transition diagram for the Turing machine of the above. [5 M]
4. Design a Turing Machine which can multiply two positive integers [10 M]
5. Design a Turing Machine "Parity Counter" that outputs 0 or 1, depending on whether the
   number of 1's in the input sequence is even or odd respectively. [10 M]
6. A. Explain about Universal Turing Machine? [5 M]
   b. Differentiate Turing Machines and Real Machines? [5 M]

Unit VI : Computability

1. a. What is Halting Problem of Turing Machine? Is it decidable or not? Explain? [5 M]
   b. What is post correspondence problem? Explain with an example. [5 M]
2. a. Explain about classes of P and NP? [5 M]
   b. Explain about classes of NP-hard and NP-complete problems? [5 M]
3. a. Give examples of decidable and an un-decidable problem. [5 M]
   b. Explain about modified post correspondence problem? Explain with an example. [5 M]

Signature of the Faculty   **Head Of The Department**

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

II-II B.TECH R16
JAVA - UNITWISE QUESTION BANK

UNIT-1
1. List and explain Java buzzwords. Which factors are making Java famous language
2. (a)Explain the concepts of Object Oriented Programming.
   (b) Write a sample java program to find the GCD of two numbers. ng
3. (a)Explain why Java is Machine Independent
   (b) Write a java program using ternary operator to find maximum of three numbers.
4. (a) How to use break and continue statements in java?
   (b) Differentiate compile time errors and runtime errors in java.
5. (a) Write about the role of JVM, JAVA API in developing the platform independent java program with suitable example.
   (b) What are the two control structures used in java for making decisions? Explain with an example program.

Unit-2
1. (a) Define class and object in java
   (b) How to use break and continue statements in java?
2. (a) Give the naming conventions in Java.
   (b) Explain the conditional instructions in detail.
3. (a) Explain copy constructor.
   (b)Write a program using copy constructor that reads complex numbers and copies that into another.
4. Discuss about polymorphism. Explain runtime polymorphism with a program.
5. (a) Can we use constructors with parameters? What kind of parameters can be given? Explain with area of various geometric shapes example.
   b) With an example program explain the concept of classes and nested classes in java

Unit-3
1. What are the benefits of inheritance? Explain various forms of inheritance with suitable code segments.
2. What is the role of 'finally' in exception handling? Explain with an example.
3. Write a program that shows an Employee class which contains various methods for accessing employee's personal information and methods for paying an employee
4. Give the syntax of exception handling and also handle exception occurred during the execution of divide by zero
5. (a) Write a program which specify that there are two classes Rectangle and Circle which implements the interface and find the area of rectangle and circle
   (b) Demonstrate nested try statements and finally statements.

Unit-4
1. Explain thread life cycle and thread creation in Java with example
2. List the methods in thread class

3. (a) Write a java program to create multiple threads.
   (b) Explain the advantages of multithreading.
4. What do you mean by multithreading? Develop a simple application program to illustrate the use of multithreading.
5. What is thread scheduling? How to perform this by setting priorities to threads. explain with an example program.

Unit-5

1. What is an applet? Explain its life cycle
2. (a) List the advantages and disadvantages of applet.
3. Write a java code to create applet and customize it based on input parameters
4. Write different methods present in Window Listener interface.
5. (a) Write an applet program that will take an input from the user to calculate the sum of two integers.
   (b) Differentiate adopter classes and inner classes with examples.

Unit-6

1. Discuss various AWT containers with examples.
2. What is the significance of Layout managers? Discuss briefly various layout managers
3. Explain various event adopter classes in awt and also give their syntaxes in java.
4. Differentiate the following
   i) TextField and TextArea.
   ii) Menu and MenuItem.
   iii) Checkbox and CheckboxGroup
5. (a) What are the subclasses of Container class?
   (b) Write different types of controls supported by awt

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Subject Name: PPL   Branch: CSE   Year/Sem : II/II   Faculty: Mr.A.Vasudeva Rao

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UNIT-1

1a)   Explain how is the order of evaluation of attributes determined for the tree of a given grammar. [5M]

b) Discuss in detail about the attribute grammars   [5M]

2 a)Explain about lexical analysis.   [5M]

b)Write short notes on context free grammar   [5m]

3. a) Give an example of left recursive rule in CFG. What is the significance of left Recursive rule? [5M]

b)How do you describe the meanings of programs using dynamic semantics?   [5M]

4a)Explain different phases of compilation.   [5M]

b)Write BNF notation for 'for loop', 'if-else condition' and structure definition in C.   [5M]

5a) Explain Top down parsing   [5M]

b) Explain bottom up parsing   [5M]

UNIT-2

1a) What is a variable? What are the attributes of a variable? Elaborate on address of a variable [5M]

b) Explain in detail about overloaded operators   [5M]

2a) Explain in detail arrays, indices, subscript bindings, and array categories   [5M]

b) Define unconditional branching. What are the problems with unconditional branching   [5M]

3a) Explain various primitive data types with suitable examples.   [5M]

b) Discuss about type-checking and control structures?   [5M]

4a) Explain the conditional statements and its implementation with examples.   [5M]

b)Explain the scope and lifetime of variables. Illustrate when they would coincide and when they don't.
                                                                                       [5M]

5a) Is static binding more reliable or dynamic binding? Explain why.   [5M]

b)Present the classification of arrays based on subscript binding. Give programming examples. [5M]

UNIT-3

1a)Define a function. What are the design issues for functions? Explain   [5M]

b)Explain how subprogram is overloaded? Give examples.   [5M]

2. a)Explain how subprograms names are passed as parameters.   [5M]

b)Define sub program. What are the distinct categories of Subprograms? [5M]

3.a)Define a subprogram. Write the semantics of call and return of a subprogram   [5M]

b)Discuss about nested subprograms with examples.   [5M]

4.a)Discuss how generic methods are implemented with suitable examples.   [5M]

b)Explain the importance of dynamic scoping with an example.   [5M]

5.a)Discuss about pass-by-result and pass-by-value-result parameter passing methods, with a detailed programming example for each. [5M]

  b)Discuss about deep access and shallow access methods for implementing dynamic scoping [5M]

UNIT-4

1 a)Discuss the design issues of Exception Handling.   [5M]
   b)Explain in detail abstract data types in java with examples.   [5M]

2 a)Compare and contrast the cooperation synchronization and competition synchronization in message passing.
                                                                          [5M]

  b)Explain the basic concepts of exception handling   [5M]

3a) How message passing is implemented in Ada? Explain with examples.   [5M]

  b) What is an event? How the events are handled in various OOP languages.   [5M]

4a) Define a Thread. How are threads different from processes? Explain java threads with examples [5M]

b) Define monitor. Explain how cooperation synchronization and competition synchronization are implemented using monitors   [5M]

5a) Discuss how producer consumer problem can be solved using concurrency in Java.   [5M]

  b)Discuss about exception handling in C++.   [5M]

UNIT-5

1a)Write about functional forms in LISP.   [5M]

  b)Give a comparison between ML and Haskell   [5M]

2a)How ML is different from other functional programming languages?`   [5M]

  b)Why were imperative features added to most dialects of LISP?   [5M]

3a)Give comparison of Functional and Imperative Languages   [5M]

  b)Explain the control structure of a PROLOG program   [5M]

4a)Explain about scheme functional programming language.   [5M]

  b)Discuss how Haskell differs from ML   [5M]

5a)Explain the principles of ML?   [5M]

  b)Explain about fundamentals of FPL?   [5M]

UNIT-6

1 a)Explain about Logic programming   [5M]

  b)Discuss in brief about the Basic elements of Prolog.   [5M]

2 a)Discuss about basic elements of Prolog   [5M]

  b)Explain different types of propositions present in logic programming.   [5M]

3 a)Discuss Terms and Goal statements in Prolog with examples   [5M]

  b)How PROLOG is different from other logic programming languages? Give an example for each feature
                                                                          [5M]

4   a)Explain Prolog interfacing process.   [5M]

   b)Explain about the inferencing process of Prolog   [5M]

5   a)List and explain the applications of logic programming.   [5M]

  b)Discuss about basic elements of Prolog   [5M]

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Faculty Name : Mrs. K.Komali   **academic year:** 2017-2018   **Subject :** software engineering

Course : B.Tech.   **Branch :** CSE –A& B   **Year:** II   **Semester :**II

QUESTION BANK

Unit I :Software and Software Engineering

1. a. What is an Software Engineering. Why it is important?   [5 Marks]
   b. Define Legacy software & explain in detail   [5 Marks]

2. a. Explain the nature of software in detail.   [10 Marks]

3. a . Explain about unified process model.   [6 Marks]
   b. List out the different applications of software .   [4 Marks]

4. Discuss about different process models in detail .   [10 Marks]

5. Explain about personal and team process models   [10 Marks]

6. Describe about generic process model.   [10 Marks]

Unit II : requirement analysis and specifications

1. a. Explain about SRS document in detail.   [10 Marks]

2. a. Describe the classification of cohesiveness.   [5 Marks]
   b. Describe the classification of coupling.   [5 Marks]

3. Explain about functional and non-functional requirements.   [10 Marks]

4. Explain about different types of specifications.   [10 Marks]

5. Discuss about different approaches to software design   [10 Marks]

6. a. What is a design process? Explain the different design activities and methodologies.
       [5 Marks]
   b. How to characterise a good software design.   [5 Marks]

Unit III :Function – Oriented Software Design and User Interface Design

1. Explain about structured analysis in detail.   [10 Marks]

2. What is a context diagram and explain adout level-1 DFD.   [10 Marks]

3. a. Discuss about mode-based versus modeless interface.   [5 Marks]
   b. Discuss about GUI versus text based user interface   [5 Marks]

4. a. Different types of user interfaces in detail.   [6 Marks]
    b. explain about characteristics of good user interface.   [4 Marks]

5. Explain the following in detail..   [10 Marks]
    a)Types of widgets   b)X architecture   c)window system

6. Describe about system design in detail   [10 Marks]

Unit IV : Coding and Testing

1. a. Define the coding standards and guidelines..   [5 Marks]
    b. What is testing? Explain the basic concepts and terminologies in testing.   [5Marks]

2. a. Explain about the debugging process.   [5 Marks]
    b. discuss about code review process.   [5Marks]

3. a. Explain in detail about black-box testing.   [7Marks]
    b. what is need of test cases.   [3Marks]

4. Explain about white box testing in detail.   [10 Marks]

5. Describe the following   .   [10 Marks]
        a) Grey-box testing of object –oriented programs
        b) Integration testing of object-oriented programs

6. a. Discuss about static analysis tools.   [5 Marks]
    b. Discuss about dynamic analysis tools.   [5 Marks]

Unit V: Software Reliability and Quality Management, Computer Aided Software

Engineering

1. a. Define software reliability. Explain about reliability metrics of software products.[7 Marks]
    b. What is a software quality? And explain.   [3 Marks]

2. a. Explain the following terms in detail.   [6 Marks]
    a) statistical testing   b)six sigma
    b) Explain about CMMI model   [4Marks]

3.   How CASE support in software life cycle explain in detail.   [10 Marks]

4. a. Define case and explain its scope.   [5 Marks]
    b. explain the case environment and benefits of CASE..   [5 Marks]

5. a. What is ISO 9000 certification? How to get ISO 9000 certification?   [5 Marks]
    b. List Salient features ISO 9001 requirements. .   [5 Marks]

6. Explain in detail about the following [10 Marks]
    a) SPICE   b) PSP

Unit VI : Software Maintenance, Software Reuse

1. a. Explain the characteristics of software evolution. [5 Marks]
   b. Discuss about software reverse engineering. [5 Marks]

2. a. Explain about software maintenance process models. [5 Marks]
   b. How to estimate maintenance cost. [5 Marks]

3. a. Define software reuse. explain basic issues in reuse program. [5 Marks]
   b. Explain about domain analysis.. [5 Marks]

4. Explain he following terms [10 Marks]
    a) Component classification   c) Searching
    b) Repository maintenance   d) Reuse without modifications

5. a. Explain about reuse at organization level. [5 Marks]
   b. Explain about the current state of Reuse. [5 Marks]

Signature Of The Faculty