

# DADI INSTITUTE OF ENGINEERING & TECHNOLOGY

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An ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007 Certified Institute.  
NH-5, Anakapalle – 531002, Visakhapatnam, A.P.

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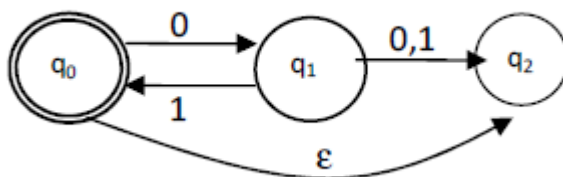
Course : B.Tech.      Branch : CSE- A      Year/Semester : II/II      Academic Year : 2017-18

Faculty Name : Dr.L.Prasanna Kumar      Subject : FLAT      Admitted Batch : 2016

## QUESTION BANK

### Unit I : Finite Automata

- What is finite Automation and explain in detail about Acceptance of a String by a Finite Automation [4 M]
  - Construct a DFA accepting the language  $\{ W \in \{a,b\}^* \mid W \text{ has neither } aa \text{ nor } bb \text{ as substring} \}$  [6 M]
- Construct a DFA to accept the language  $L = \{ w/w \text{ has both an even number of } 0\text{'s} \text{ and even number of } 1\text{'s} \}$ . [5 M]
  - Construct a DFA equivalent to the NFA given below



- 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]
  - What is minimal DFA? Write the minimization Algorithm for DFA? [5 M]
- Construct a Deterministic Finite State Automata equivalent to the NFA given below  $M = \{ (q_0, q_1, q_2, q_3), \{0,1\}, \delta, q_0, \{q_3\} \}$  where  $\delta$  is defined by the following transition table [6 M]

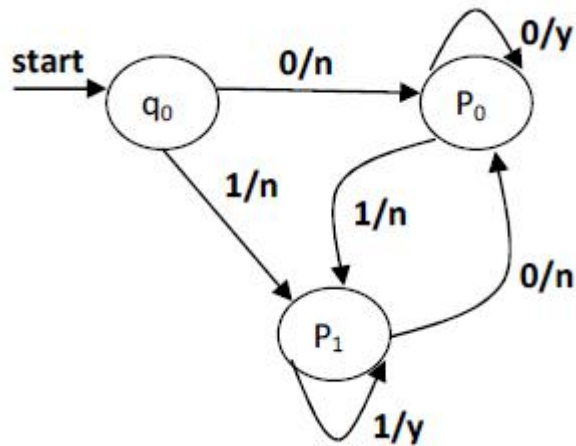
$\delta$	0	1
$q_0$	$(q_0, q_1)$	$(q_0)$
$q_1$	$(q_2)$	$(q_1)$
$q_2$	$(q_3)$	$(q_3)$
$q_3$	null	$(q_2)$

- Convert NFA to DFA with suitable example? [4 M]
- 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]
  - Design a mealy machine to print out 1's complement of an input bit string? [5 M]
- Convert the following Mealy machine to an equivalent Moore machine [5 M]

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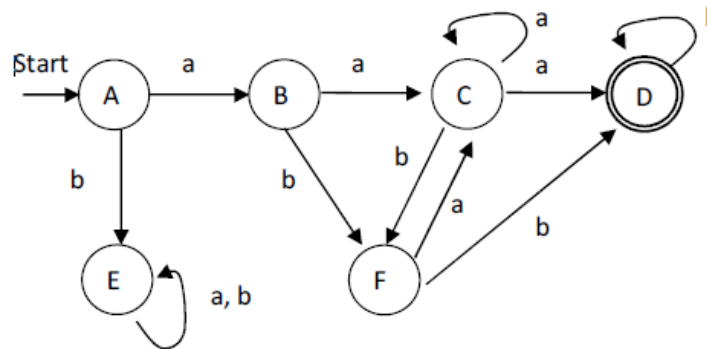
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b. Reduce the DFA given below

[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  $\epsilon$  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]

$\delta$	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  $L = \{ a^n b^m \mid n, m \geq 1 \}$  [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 (NFA) with  $\epsilon$ -moves for the regular expression  $(10+11)^*00$ . [5 M]

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- 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]  
 $S \rightarrow AaB \mid aaB$   
 $A \rightarrow \epsilon$   
 $B \rightarrow bbA \mid \epsilon$
2. a. Write the general procedure to transform a grammar to Greibach Normal Form? [5 M]  
b. Prove that  $S \rightarrow aSbS \mid bSaS \mid \epsilon$  is ambiguous. [5 M]
3. Remove all  $\epsilon$  and unit production rules from the following CFG [10 M]  
 $S \rightarrow AaA \mid CA \mid BaB$   
 $A \rightarrow aaBa \mid CDA \mid aa \mid DC$   
 $B \rightarrow bB \mid bAB \mid bb \mid aS$   
 $C \rightarrow Ca \mid bc \mid D$   
 $D \rightarrow bD \mid A$
4. a. Construct a Greibach Normal Form grammar equivalent to the following CFG [5 M]  
 $S \rightarrow AA \mid 0$   
 $A \rightarrow SS \mid 1$   
b. Prove that the following grammar of arithmetic expression is ambiguous. [5 M]  
 $E \rightarrow E+E \mid E^*E \mid (E) \mid (id)$
5. a. Consider the CFG with the following production rules: [5 M]  
 $S \rightarrow aB \mid bA$   
 $A \rightarrow bAA \mid aS \mid a$   
 $B \rightarrow aBB \mid bS \mid b$   
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]  
 $S \rightarrow ASB \mid AB$   
 $A \rightarrow a$   
 $B \rightarrow b$
6. a. Convert the following grammar into Chomsky Normal Form. [6 M]  
 $S \rightarrow aB \mid bA$   
 $A \rightarrow bAA \mid aS \mid a$   
 $B \rightarrow aBB \mid bS \mid b$   
b. What is pumping lemma 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]

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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  $L = \{W W^R \mid W \in (a+b)^*\}$  [6 M]
2. a. Design a Turing Machine to recognize the language  $L = \{1^n 2^n 3^n \mid n \geq 1\}$  [5 M]
- b. Design a Turing Machine to compute  $\text{Max}(n_1, n_2)$ ? [5 M]
3. a. Design a Turing machine that accepts the language  $L = \{W W^R \mid W \in (0+1)^*\}$  and  $W^R$  is reverse of  $W$  [5 M]
- b. Design a Turing machine to accept the set of all palindromes 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 undecidable problem. [5 M]
- b. Explain about modified post correspondence problem? Explain with an example. [5 M]

Signature of the Faculty

Head Of The Department

**Department of COMPUTER SCIENCE & ENGINEERING**

**JAVA PROGRAMMING**

**Class - II CSE (A) - II Semester    Regulation : R16    Name of the Faculty- A.A.Narasimham**

**UNIT-I**

- 1) A) What is procedural language? Differentiate between procedural language and OOP? (6 M)  
B) What is byte code? How it will be generated?(4 M)
- 2) A) Explain the Java Features? (7 M)  
B) Write the Java Program structure? (3 M)
- 3) A) Explain briefly the following object oriented concepts. (6 M)  
i) Abstraction ii) Polymorphism  
B) "Java is called Machine Independent Language"-Justify this statement with proper explanation (4M)
- 4) A) Explain briefly the following object oriented concepts. (6 M)  
i) Encapsulation ii) Inheritance  
B) "Write Once and Run Anywhere" – support this statement with proper reasoning (4 M)
- 5) A) Explain the need of object oriented programming (7 M)  
B) What are the applications of OOP? (3 M)
- 6) A) What are the advantages and disadvantages of OOP (6 M)  
B) Write about JVM? (4 M)

**UNIT – II**

- 1) A) Discuss about primitive data types in Java (4 M)  
B) Discuss various control structures available in Java (6 M)
- 2) A) Explain how Java handles cleaning up of unused objects (5 M)  
B) Write a Java program to sort a given set of strings in the alphabetic order
- 3) A) What is a constructor? Explain Constructor overloading with example? ( 7 M)  
B) Illustrate type casting in Java with an example? (3 M)
- 4) A) Explain the key word 'static' regarding variables and methods in Java with example? (6 M)  
B) Define the terms Class and Object? How to allocate memory for objects in Java? Give example? (4M)
- 5) A) Explain the keyword 'this' with example ( 5 M)  
B) Write a java program to perform the following functions using classes, objects and constructors wherever necessary (5 M)  
i)Read 5 subjects marks of 5 students ii)Calculate the total and print the result on the screen
- 6) A) Discuss Unary, Binary and Ternary operators in Java? (5 M)  
B) Write a Java program to check whether a given number is palindrome or not? (5 M)

**UNIT - III**

- 1) What are the different types of inheritances? Discuss with examples for each (10 M)
- 2) A) Explain the differences between class, abstract class and interface with syntax and example (6 M)  
B) Write a Java program to find the area and perimeter of square and circle using interface (4 M)
- 3) A) Explain the keyword 'final' with syntax and example (7 M)

- B) Explain various access specifiers supported by Java (3 M)
- 4) Explain in detail about Exception Handling mechanism in Java with syntax and example (10 M)
- 5) A) Explain Creating Packages and Accessing a Package with example (6 M)  
B) Explain Method Overloading with example? (4 M)
- 6) A) What is Method overriding? Explain with example? (5 M)  
B) Explain the keyword 'super' with syntax and example? (5 M)

### UNIT-IV

- 1) A) Explain sleep() and wait() methods (5 M)  
B) Write a Java Program that prints numbers from 1 to 10 line by line after every 5 seconds(5 M)
- 2) A) Discuss various methods used to create threads(Thread class & Runnable Interface) (5 M)  
B) Explain stopping and blocking a thread (5 M)
- 3) A) What is thread synchronization? Discuss with example(5 M)  
B) What is the purpose of isAlive() and join() methods in Java (4 M)
- 4) A) "Threads can be given priorities" – support this statement with suitable example(5 M)  
B) Write a Java Program to demonstrate Multithreading operation (5 M)
- 5) A) Explain creating threads in Java – 4 M  
B) Explain life-cycle of a thread with neat diagram – 6 M
- 6) A) Explain how communication between threads takes place with a programming example – 7 M  
B) Explain Suspending and resuming threads – 3 M

### UNIT-V

- 1) A) What is applet? Explain the differences between Applications and Applets – 5 M  
B) Write Applet program to draw a Polygon 5 M
- 2) A) Explain Applet Structure – 3 M  
B) Explain Applet Life Cycle – 7 M
- 3) A) Explain Event Delegation Model (EDM)? – 6 M  
B) Write Applet program to draw a Rectangle? 5 M
- 4) A) Explain paint(), update() and repaint() methods? – 5 M  
B) What is event? What are the sources of event? – 5 M
- 5) A) What is source and listener in Java event handling? – 5M  
B) Explain the concept of Adapter classes – 5 M
- 6) A) What is Inner class? Explain? 5 M  
B) Write Applet program to draw different shapes? 5 M

### UNIT VI

- 1) A) What is AWT? Write the Java AWT Hierarchy? – 4 M  
B) Explain the Flow layout and Grid Layout – 6 M
- 2) A) What are the different types of controls supported in AWT? – 4 M  
B) Discuss in detail about Button control with example – 6 M
- 3) Discuss about the following components (5 M + 5 M)  
A) Label                      B) Checkbox
- 4) Discuss about the following components (5 M + 5 M)  
A) TextField                B) Choice
- 5) Discuss about the following components (5 M + 5 M)  
A) List                      B) Menu

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**Subject Name: PPL**

**Branch: CSE**

**Year/Sem : II/II**

**Faculty: Mr. Ramaraju**

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**UNIT-1: Syntax and Semantics**

- 1) a) What constitutes a Programming environment? (4 M)  
b) Explain the process of compilation in each phase of a compiler. (6 M)
- 2) a) Write about the evolution of programming languages-briefly (7 M)  
b) Define Syntax and Semantics. (3M)
- 3) a) What are the main features of the programming paradigm with examples? (7 M)  
b) Write about Virtual Machines. (3 M)
- 4) Explain Language Evaluation criteria and the characteristics that affect them. (10 M)
- 5) a) Define CFG? What does it mean for CFG to be ambiguous. (5 M)  
b) Differentiate between Hybrid Interpretation and Pure Interpretation? (5 M)

**UNIT – II: Data Types, and Basic Statements**

- 1) a) What is meant by type checking? Differentiate between static type checking and dynamic type checking and give their relative advantage? (5M)  
b) Define grammars, derivation and a parse tree? (5 M)
- 2) a) Define Syntax and Semantics (4 M)  
b) Explain Dijkstra's selection construction and loop structure (6 M)
- 3) a) Explain user-located loop control mechanisms provided by various languages (5 M)  
b) Explain arrays, indices, subscript bindings and array categories (5 M)
- 4) a) What are dangling pointers and lost heap-dynamic variables? How they are created? (6 M)  
b) Write a short note on Short Cut Evaluation? (4 M)
- 5) a) Explain in detail various design issues of character string types. (5 M)  
b) What is a variable and what are the attributes of a variable? (5 M)

**UNIT – III Subprograms and Implementations**

- 1) a) Explain In mode and Out Mode parameter passing mechanism. (6 M)  
b) What are the various design issues of sub-programs. (4 M)
- 2) a) Explain Local referencing environment. (5 M)  
b) Discuss in detail overloaded operators? (5 M)
- 3) a) What are the various design issues of functions. (4 M)  
b) Discuss in detail overloaded methods? (6 M)
- 4) a) How to implement generic functions in C++ (6 M)  
b) What are the characteristics of co-routine feature? List the languages which allow co-routines (4 M)
- 5) a) What are the advantages and disadvantages of dynamic local variables (5 M)  
b) Write in detail about nested sub programs. (5 M)

**UNIT – IV :Object Orientation, Concurrency and Event Handling**

- 1) a) What are the various design issues for OOP languages (5 M)  
b) Explain Message passing. (5 M)
- 2) a) Explain various Object Oriented constructs. (5 M)  
b) Explain Concurrency in Ada. (5 M)
- 3) a) Discuss about producer-consumer problem. (6 M)  
b) What is the difference between checked and unchecked exception in Java. (4 M)

- 4) a) Discuss about Dining Philosopher's problem (5 M)
- b) Explain the concept of Semaphores. (5 M)
- 5) a) With respect to OOP, briefly explain virtual functions (4 M)
- b) Explain Exception Handling mechanism in C++. (6 M)

### **UNIT – V : Functional Programming Languages**

- 1) a) What is type inferencing used in ML? (6 M)
- b) What are the features of Haskell that makes very different from Schema? (4 M)
- 2) a) What are the main features of Functional Programming Languages? (4 M)
- b) Write a LISP function fib(n) that computes nth Fibonacci number? (6 M)
- 3) a) Explain LISP interpreter (6 M)
- b) Explain various functions provided in LISP. (4 M)
- 4) a) Write about Lambda Calculus? (6 M)
- b) What are the three features of Haskell that makes very different from Schema? (4 M)
- 5) a) Explain Data Types and Structures in LISP (7 M)
- b) Explain Primitive Numeric Functions in Scheme. (3 M)

### **UNIT-VI :Logic Programming Languages**

- 1. a) For what sort of application logic programming is useful? Briefly explain. (6 M)
- b) Describe about Fact Statements in Prolog (4 M)
- 2) a) Explain Propositions (6 M)
- b) Discuss Clausal Form? (4 M)
- 3) a) What is Inferencing Process of Prolog? (6 M)
- b) Discuss Goal Statements in Prolog (4 M)
- 4) a) Explain Rule statements in Prolog (6 M)
- b) Discuss Terms in Prolog (4 M)
- 5) a) Explain Simple arithmetic in Prolog (6 M)
- b) Discuss Clausal Form? (4 M)



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

**Course : B.Tech.**

**Branch : CSE –A**

**Year: II**

**Semester :II**

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## 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 about 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]

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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]

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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 the 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**

**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. Explain.
- 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. Explain.

**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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Faculty Name : Mr.A.Vasudeva Rao

Subject :

Computer Organization

Course :B.Tech. Branch : CSE -A&B

Year:II

Semester :II

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## QUESTION BANK ( Academic Year 2017-18)

### UNIT-I

1. a) Explain the basic operational concepts of the computer instruction  
ADD LOCA, R0. (5M)

b) Explain the connections between memory and processor with neat  
block diagram. (5M)
2. a) What is a bus? Explain single bus structure in architecture. (5M)

b) Explain how the performance of a computer can be measured? What  
are measures to improve the performance? (5M)
3. a) With a neat diagram explain the connections between the different  
processor register and the memory. (5M)

b) What is a bus? Explain single bus and multiple bus structure used to  
interconnect functional units. (5M)
4. a) Explain different functional units of a digital computer. Mention the  
functions of different processor registers i)IR ii)MAR iii)PC (5M)

b) List and explain the developments made during different generations of  
a computer. (5M)
5. a) Explain how will you measure the performance of a computer. (5M)

b) Explain multiple bus organization (5M)

## UNIT-II

1. Mention four types of operations required to be performed by instructions in a computer. Show how the operation  $C = A + B$  can be implemented using :
  - i. Three address instruction
  - ii. Two address instruction
  - iii. One address instruction. (10M)
  
2. Explain the following instructions with example (10M)
  - i) Logical
  - ii) Rotate
  
3. Explain about following Addressing modes (10M)
  - a) Immediate
  - b) Register
  - c) Absolute
  - d) Indirect
  - e) Base with index
  - f) Base with index and offset
  - g) Relative
  - h) Autoincrement
  - i) Autodecrement
  
4. Explain
  - a) Logical
  - b) Shift
  - c) Rotate instructions with examples. (10M)
  
5. a) Explain the Instruction Sequencing and its complete execution (5M)  
b) Write notes on: a) Register transfer notation. b) Assembly language Notation. (5M)

## UNIT-III

1. a) Explain about arithmetic instructions (5M)  
b) Explain about logic instructions (5M)
  
2. a) Explain about branch instructions (5M)  
b) List the different types of addressing modes . Explain index addressing mode with example program. (5M)

3. a) Explain about I/O operations . (5M)  
b) write a ALP that reads a line of characters and displays it. (5M)
4. a) Explain about logical shift left and logical shift right instructions (5M)  
b) Explain about basic input and output operation (5M)

#### Unit-IV

1. a) Explain USB and PCI Bus. (5M)  
b) Explain the USB architecture with a neat diagram (5M)
2. a) What is Synchronous Bus Transfer? Explain with a timing diagram (5M)  
b) What is Asynchronous Bus Transfer? Explain with a timing diagram. (5M)
3. a) What is DMA? Explain. (5M)  
b) What are Priority Interrupts? Explain. (5M)
4. a) What is Interrupt driven I/O? Explain how an I/O is serviced? (5M)  
b) Write a note on Peripheral Component Interconnect (PCI) Bus. (5M)
5. a) Explain about PCI Bus (5M)  
b) Explain how a read operation is performed using PCI Bus. (5M)

#### Unit-V

1. a) Explain the memory operations Read and Write. (5M)  
b) Explain the following: a) PROM b) EPROM c) Flash e) EEPROM (5M)
2. a) Discuss how read and write operations are carried out in a cache memory. (5M)  
b) Explain about a) EEPROM b) Flash Memory (5M)
3. a) Explain about Magnetic Hard disks & Optical Disks (5M)  
b) Explain about various mapping techniques in Cache memory (5M)
4. a) How many address bits are required to access a main memory location? (5M)  
b) What are the number of bits in TAG, SET and WORD fields? (5M)
5. a) Explain any two cache mapping functions. (5M)  
b) What do you mean by memory interleaving? Explain (5M)

#### Unit-6

1. a) What are the advantages and disadvantages of hardwired and microprogrammed control? (5M)  
b) Explain the basic concepts of micro programmed control (5M)
2. a) Discuss two types of microinstructions. (5M)



- b) Describe the organization of microprogrammed control unit. Define the following terms: microinstruction, microoperation, microroutine, control word and control store. (5M)
3. a) Discuss the organization of hardwired control unit. (5M)  
b) Describe Microprogram sequencing (5M)
4. a) What are the advantages and disadvantages of hardwired and microprogrammed control? (5M)  
b) Explain about microinstructions with next-address field (5M)
5. a) Explain about performing arithmetic or logic operation circuit? (5M)  
b) Explain about how to fetching a word from memory? (5M)