

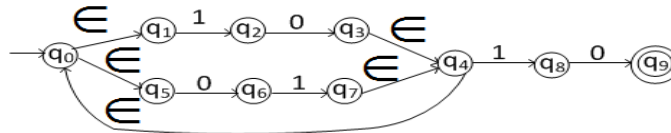
**II B.Tech II Semester(R09) Regular Examinations, April/May 2011**  
**FORMAL LANGUAGES & AUTOMATA THEORY**  
 (Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

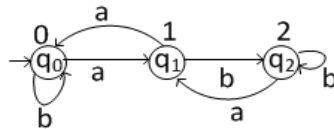
Answer any FIVE questions  
 All questions carry equal marks  
 ★★★★★

- (a) Define an NFA. Draw the transition graph of NFA that accepts the language generated by the regular expression  $(10+01)^*1(0+1)$ . Process the string 100111 on the machine.  
 (b) Define DFA. Draw the transition graph of the DFA that accepts the language generated by the regular expression  $(a+b)^*ba$ . Process the string abba.
- (a) Define NFA- $\epsilon$ . Convert the following NFA- $\epsilon$  into it's equivalent NFA.



Process the string 101010 on both the machines.

- (b) Define Moore and Melay machines. Convert the following Moore machine into its equivalent Melay machine.



- (a) Construct an NFA- $\epsilon$  that recognizes the language generated by the regular expression  $(11+01)^*10(0+1)^*$ . Process the string 111001.  
 (b) State pumping lemma for regular languages. Prove that the language of palindromes over the alphabet  $\{a, b\}$  is not regular.
- (a) Define a regular grammar. Find the FA that recognizes the language generated by the following right linear grammar.  
 $S \rightarrow OA/1B/1C$   
 $A \rightarrow 1A/OC$   
 $B \rightarrow 1B/O/1$   
 $C \rightarrow OC/O/1A$   
 (b) Define leftmost and right most derivations. Find out the leftmost, right most derivations and draw the corresponding derivation trees for the string  $(a+a)^*a$  in the following grammar.  
 $E \rightarrow E + T/T$   
 $T \rightarrow T * F/F$   
 $F \rightarrow (E)/a$
- (a) Eliminate  $\epsilon$ -productions from the following CFG.  
 $S \rightarrow ABBAC$   
 $A \rightarrow AB/a/B$   
 $B \rightarrow A/CB/AC/b/\epsilon$   
 $C \rightarrow d$   
 (b) Convert the following CFG into CNF  
 $S \rightarrow ABC/BaB$   
 $A \rightarrow Aa/BaC/a$   
 $B \rightarrow bBb/a$   
 $C \rightarrow aC/bC/c$
- When do you say that a language is recognized or accepted by a PDA? Design a PDA for  $L = \{a^i b^j c^k / j \geq i + k \text{ and } i, j, k > 0\}$ . Process the string aaabbbbbcc using instantaneous description.
- Design a TM for recognizing  $L = \{xx/x \in \{a, b\}^*\}$ . Show the moves of the TM for the string abaaba and abaabb.
- Write short notes on the following:  
 (i) NP hard and NP complete problems. (ii) Posts correspondence problem. (iii) Linear Bounded Automata.

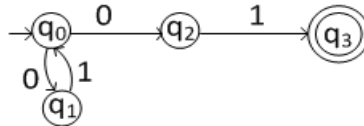
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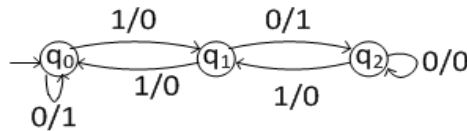
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- (a) Define DFA. Draw the transition graph on transition table for the DFA which recognizes  $L = \{x \in \{a, b\}^*/x \text{ ends with } ba\}$  Process the string bbab.
- (b) Define NFA. Draw the transition graph and transition table of NFA which can recognize  $(0+11)^*0(11+00)$ .
- (a) Convert the following NFA into its equivalent DFA. Process the string 0101 on both the machines.



- (b) Define Moore and Melay machines. Convert the following Melay machine into equivalent Moore machine.



- (a) Construct an FA which can recognize the language generated by the regular expression  $(00+10)^*11(0+1)$ . Process the string 10110 on the FA.
- (b) Write any eight identify roles for regular expression and any four closure properties of regular sets ( regular languages ).
- (a) Find an FA which can recognize the language generated by the following regular grammar.  
 $S \rightarrow 00A/11B$   
 $B \rightarrow 01/10$   
 $A \rightarrow 0B/1A/1$   
 Check the acceptability of 00010.
- (b) Design a CFG that generates strings over the alphabet  $\{a,b\}$  that contain unequal number of a's and b's.
- (a) How do you a eliminate the unit productions from a given CFG? Eliminate the unit productions from the following CFG.  
 $E \rightarrow E + T/T$   
 $T \rightarrow T * F/F$   
 $F \rightarrow (E)/a$
- (b) Define CNF for CFGs. Convert the following CFG into its equivalent CNF.  
 $S \rightarrow abA/bB/aba$   
 $A \rightarrow b/aB/bA$   
 $B \rightarrow aB/aA$
- (a) Design a PDA for recognizing the language of palindromes over  $\{0,1\}$ . Process the string 00100.
- (b) How do you find out PDA that recognizes the language generated by a CFG? Find the PDA which recognizes the language generated by the following CFG.  
 $S \rightarrow 01A/1B$   
 $A \rightarrow 00A/11B/0/1$   
 $B \rightarrow 1A/0B/0$
- (a) What are computable functions? Design a TM for computing the multiplication of two given integers.
- (b) Discuss about Church's hypothesis.
- Write brief notes on the following:
  - Context Sensitive Languages.
  - Universal Turing Machine.
  - Posts correspondence problem.

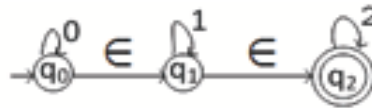
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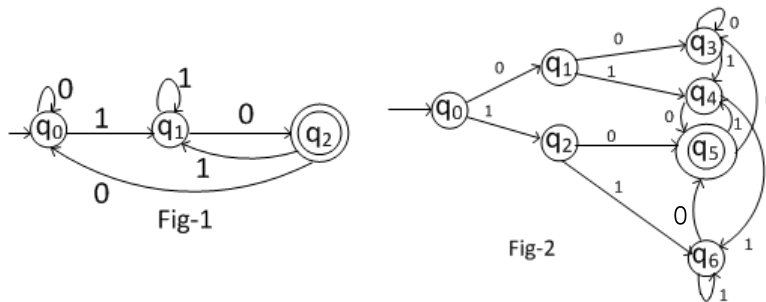
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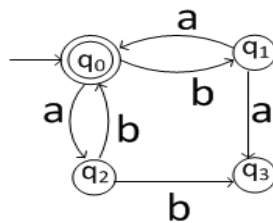
1. (a) Draw the transition graph and transition table of an NFA for accepting the strings generated by the regular expression  $(00+11)^*10$ . Process the string 001110.
- (b) Design a DFA for accepting the language of strings over  $\{0,1\}$  that do not contain 10 as substring. Process the string 0011.
2. (a) Find the NFA equivalent to the following NFA-E. Process the string 0112 on both the machines.



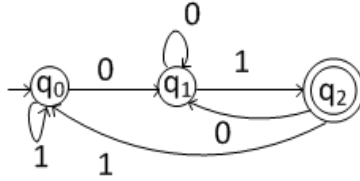
- (b) Check the equality of the following FA'S.



3. (a) Find the regular expression for the language recognized by the following FA.



- (b) State the pumping lemma for regular languages. Prove that the language of all strings over  $\{a, b\}$  that contain equal no. of a's and b's is not a regular language.
4. (a) Define a CFG. Find a CFG which generate the strings over the alphabet  $\{0,1\}$  and does not contain equal number of 0's and 1's. Find the left most derivation, rightmost derivation and derivation tree for the string 01100.
- (b) Find a right linear grammar generating the language recognized by the following FA.



5. Convert the following CFG into Greibach Normal form
  - $E \rightarrow E + T/T$
  - $T \rightarrow T * F/F$
  - $F \rightarrow lE/a$
6. (a) Define a PDA. Design a PDA for recognizing
  - $L = \{x \in \{0, 1\}^* / x = 0^i i^j o^k \text{ and } j = i + k, i, j, k > 0\}$  Process the string 011100 on the PDA.
  - (b) Write the procedure for finding a CFG equivalent to a given PDA.
7. Write brief notes on the following:
  - (i) Church's hypothesis (ii) Counter machines (iii) Computable functions.
8. Write brief notes on the following:
  - (i) Linear bounded automata. (ii) Universal Turing machine. (iii) Post's correspondence problem.

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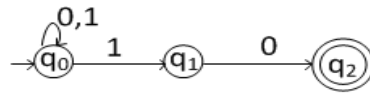
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1. (a) What are various operations that can be performed on languages ? Explain with examples.  
 (b) Design a DFA that accepts (recognizes) strings containing even no of a's and odd no of b's. Draw it's transition diagram and transition tables. Process the string ababb.
2. (a) Convert the following NFA into DFA.



Process the string 0010 on both the machines.

- (b) Draw a Moore machine for calculating mod 3 of a given binary number. Find it's equivalent Mealy machine.
3. (a) Write any 8 identify rules for regular expressions.  
 (b) Write any 4 closure properties of regular sets.  
 (c) Prove that the language of palindromes over {a,b} is not a regular language using pumping lemma.
4. (a) Find a right linear grammar for the language  $(0+1)^*10$ . Draw the transition diagram of the FA from the grammar designed.  
 (b) Design a CFG for the language of non-palindromes over {a,b}. Find the derivations for the strings abad and ababaa.
5. (a) What is meant by ambiguous CFG? Prove that the grammar  $E \rightarrow E + E / E * E / a$  is ambiguous.  
 (b) Write the procedure for converting a CFG into its equivalent CNF. Convert the following CFG into CNF.  

$$E \rightarrow E + T / T$$

$$T \rightarrow T * F / F$$

$$F \rightarrow (E) / a$$
6. (a) Design a PDA for accepting the language of palindromes over {a,b}. Process the string ababa.  
 (b) Design a PDA for accepting the language generated by the following CFG.  

$$S \rightarrow ab/aA/aB$$

$$A \rightarrow aA/a$$

$$B \rightarrow bB/b$$
7. Design a TM for accepting the strings of language  $L = \{x \in \{a,b\}^* / x = yy \text{ for some } y \in \{a,b\}^*\}$  Process the string abab.
8. (a) Write about Chomsky hierarchy of languages.  
 (b) Write a brief note of NP hard and NP complete problems.

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II B.Tech II Semester(R09) Regular Examinations, April/May 2011  
ENVIRONMENTAL SCIENCE

(Common to Civil Engineering, Mechanical Engineering, Information Technology, Computer Science & Engineering, Aeronautical Engineering, Biotechnology)

Time: 3 hours

Max Marks: 70

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1. Discuss about present environmental issues on global concern.
2. (a) Define renewable and non renewable resources.  
(b) Discuss about the energy resources.
3. (a) Discuss about the characteristic features, structure and functions of the ecosystem.  
(b) Discuss about desert eco system and forest ecosystem.
4. (a) Discuss about endemic and endangered species in India with example.  
(b) Write note on value of biodiversity.
5. Discuss causes, effects and control measures of water pollution.
6. Discuss about the:  
(a) Resettlement and rehabilitation of people.  
(b) Urban problems related to energy.
7. Discuss about the:  
(a) Population growth.  
(b) Women and child welfare.
8. Write the report on the local polluted site you have visited.

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1. Discuss about government's initiative for environmental management.
2. Discuss uses and over utilization of mineral resources.
3. (a) Discuss about food chains and food webs with examples.  
(b) Discuss about ecological pyramids.
4. Discuss about genetic biodiversity, species and ecosystem diversity.
5. Discuss in detail about the thermal pollution and its problems.
6. Discuss about the air and water prevention and control of protection act.
7. Note on:
  - (a) Role of information Technology in Environment and human health.
  - (b) Family welfare programs.
8. Write the field report on the grass land ecosystem.

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1. Discuss about environmental crisis and sustainable development.
2. Discuss in detail about uses and over exploitation of forest resources.
3. (a) Discuss about the Energy flow in the ecosystem.  
(b) Discuss about ecological succession.
4. Discuss in-situ and ex-situ conservation of biodiversity.
5. Write short note on noise and soil pollution.
6. Write note on:
  - (a) Water shed management.
  - (b) Rain water harvesting.
7. (a) Discuss about the Environment and human health.  
(b) Define Environment.
8. Discuss your observation on local agricultural polluted site you have visited.

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1. Write a detailed note on the role of any four organizations in the field of environment and their contribution to better management.
2. Discuss in detail about the:
  - (a) World food problems.
  - (b) Changes caused by agriculture and over grazing.
3.
  - (a) Discuss about the Grassland ecosystem and aquatic ecosystem.
  - (b) Define the ecosystem.
4. Discuss the following:
  - (a) Habitat loss
  - (b) Poaching of wild life
  - (c) Hot spots of Biodiversity
5. Discuss causes, effects and control measures of Air pollution.
6. Write short note on:
  - (a) Climate changes
  - (b) Global warming
  - (c) Acid rain
7.
  - (a) Explain HIV/AIDS.
  - (b) Write note on human rights and value education.
8. Write the documentation on environmental assets in your visit.

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**II B.Tech II Semester(R09) Regular Examinations, April/May 2011**  
**DESIGN & ANALYSIS OF ALGORITHMS**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science  
& Engineering)

Time: 3 hours

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1. (a) Differentiate between recursive and non - recursive algorithms. Write a non recursive and recursive algorithm to find the factorial of a given number.  
(b) Discuss in detail about the different asymptotic notations with suitable examples.
2. (a) Write a pseudocode to determine bicomponents.  
(b) Prove that two biconnected components can have at most one vertex in common and this vertex is an articulation point.  
(c) Write simple algorithms for union and find operations.
3. (a) Write an algorithm to sort a set of elements by using sort technique.  
(b) Sort the following array of elements by using merge sort technique  
(179,285,310,351,652,254,423,861,450,520)
4. (a) Write a faster algorithm for job sequencing problem.  
(b) Explain with example, the procedure to find the minimum cost spanning tree by using prim's algorithm.
5. Explain the reliability design in detail. Design a three stage system with device types  $D_1, D_2$  and  $D_3$ . The costs are \$30,\$15 and \$20 respectively. The cost of the system is no more than \$105. The reliability of each device type is 0.9,0.8 and 0.5 respectively.
6. (a) Write a recursive backtracking algorithm for sum of subsets problem.  
(b) Draw the state space tree for mcoloring when  $n=3$  and  $m=3$ .  
(c) Write an algorithm to estimate the efficiency of backtracking technique.
7. (a) Write the control abstraction for LC - Search.  
(b) Explain in detail about FIFO branch and bound and LC Branch and Bound.
8. Explain the following:
  - (a) decision problem
  - (b) clique
  - (c) non deterministic machine
  - (d) satisfiability

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1. (a) What is the use of asymptotic notations. Explain different asymptomatic notations with suitable example.  
 (b) What is meant by space complexity. Explain, how to measure the space complexity with suitable examples.
2. (a) Explain in detail about the weighted union and collapsing find algorithm with suitable examples.  
 (b) Write a short notes on bi connected components.
3. (a) Explain the general method of Divide and Conquer and present a control abstraction for the same  
 (b) Write a short notes on stressen's matrix multiplication.
4. (a) Write in detail about the general method of the greedy technique.  
 (b) Find the optimal solution for the following knapsack problem with  $n=3, m=20, (p_1, p_2, p_3)=(25, 24, 15)$  and  $(w_1, w_2, w_3)=(18, 15, 10)$ .
5. (a) Give brief description about the All pairs shortest paths problem.  
 (b) Write a detailed note on the general method of dynamic programming.
6. (a) Explain the following with examples.  
 (i) Explicit Constraints. (ii) Implicit Constraints.  
 (iii) Solution Space (iv) Answer States. (v) state space tree.  
 (b) Write the general iterative backtracking algorithm.

7. Consider the traveling salesperson instance defined by the cost matrix

$\alpha$	07	03	12	08
03	$\alpha$	06	14	09
05	08	$\alpha$	06	18
09	03	05	$\alpha$	11
18	14	09	08	$\alpha$

- (a) Find the reduced cost matrix.
  - (b) Draw the state space tree.
  - (c) Find the minimum cost path.
8. (a) Explain the non deterministic sorting and searching algorithms.  
 (b) Discuss in detail the different classes in NP-Hard and NP-Complete.

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1. (a) What is meant by performance analysis. Explain them with suitable example.  
(b) Write an algorithm to find the factorial of a given number using iterative method and also write the step table for the same.
2. (a) Discuss in detail about the different set operations with suitable examples.  
(b) What is degenerative tree. union(1,2),union(2,3),union(3,4),union(4,5),.....union(n-1,n) and find(1),find(2),.....find(n). Draw the degenerative tree for the above sequence of operations.
3. (a) Explain with example, the merge sort technique to sort a set of elements.  
(b) Prove that the average case time complexity of quick sort is  $O(n \log n)$ .
4. (a) Prove that  $p_1/w_1 \geq p_2/w_2 \geq \dots \geq p_n/w_n$  the greedy knapsack generates an optimal solution to the given instance of the knapsack problem.  
(b) Write a greedy algorithm for sequencing unit time jobs with deadlines and profits.
5. (a) Write an algorithm to find the minimum cost binary search tree.  
(b) Explain merging and purging rules with suitable examples.
6. (a) Write an algorithm for all solutions to be n-queens problem.  
(b) Draw the tree organization of the 4 - queens solution space.
7. (a) Write the control abstraction for LC - search.  
(b) Explain in detail about FIFO branch and bound and LC Branch and Bound.
8. Give brief description about the cooks theorem.

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(b) Discuss in detail about the different asymptotic notations with suitable examples.
2. (a) Explain the different storage representation techniques of sets with suitable example.  
(b) Give brief description about the bi connect components.
3. (a) Write a iterative quick sort algorithm to sort a set of elements. Explain it with an example.  
(b) Write the control abstraction for Divide and Conquer.  
(c) Write a short notes on Strassen's matrix multiplication.
4. (a) Write a high level description of job sequencing algorithm.  
(b) Give brief description about the general method of a greedy technique.  
(c) Find the optimal solution to the following job sequencing problem with  $n=5$ ,  
 $(p_1, p_2, \dots, p_5) = (20, 15, 10, 5, 1)$  and  $(d_1, d_2, \dots, d_5) = (2, 2, 1, 3, 3)$ .
5. (a) Write an algorithm to find the minimum cost binary search tree.  
(b) What are dominance rule and merging rule. Explain them with suitable example.
6. (a) Draw the solution space organization for the sum of subsets for  $n=4$ ,  $(w_1, w_2, w_3, w_4) = (11, 13, 24, 7)$  and  $m=31$ .  
(b) Explain in detail the sum of subsets problem by using dynamic programming.

7. Consider the traveling salesperson instance defined by the cost matrix

$\alpha$	20	30	10	11
15	$\alpha$	16	04	02
03	05	$\alpha$	02	04
19	06	18	$\alpha$	03
16	04	07	16	$\alpha$

- (a) Find the reduced cost matrix.
  - (b) Draw the state space tree.
  - (c) Find the minimum cost path.
8. (a) Explain the non deterministic sorting and searching algorithms.  
(b) Discuss in detail the different classes in NP -Hard and NP - Complete.

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**II B.Tech II Semester(R09) Regular Examinations, April/May 2011**  
**DATABASE MANAGEMENT SYSTEMS**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science  
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1. (a) What are the basic building blocks of data model.  
(b) Explain about the importance of database design.
2. (a) What are the different decisions to be made during the design of an ER diagram.  
(b) What do you mean by entity clustering. Illustrate with an example.
3. (a) For foreign key violations, SQL provides several alternatives to deal with violations. Illustrate them with examples.  
(b) Explain in detail various integrity constraints over selections.
4. Consider the following sectional schema.  
Employee (employee-name,street,city)  
Works (employee-name, company-name, salary)  
Company (company -name, city)  
Managers(employee-name, manager-name)  
Give expressions in SQL for the following queries.
  - (a) Find the names of all employees in this database who line in the same city as the company for which they work.
  - (b) Find the names of all employees who live in the same city and on the same street as do their managers.
  - (c) Find the names of all employees in this database who do not work for first bank corporation.
5. What is the need for normalization. Give the process of normalization.
6. (a) Explain about optimistic concurrency control mechanism.  
(b) Explain about recovery using validation based protocol.
7. (a) Explain how loss of non volatile storage be death with.  
(b) Explain in detail about concurrent transactions.
8. Illustrate with example dynamic hashing.

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1. (a) What do you mean by a data model. Explain how data models have evolved.  
(b) Explain with examples various levels of data abstraction.
2. (a) Explain in detail various choices in developing an ER diagram.  
(b) What do you mean by aggregation. ? Explain with an example how aggregation can be indicated in an ER diagram.
3. Consider the following relational scheme.  
Employee (employee-name, street, city )  
Work ( employee-name, company-name, salary )  
Company ( Company-name, city )  
Managers ( employee-name, manager -name )  
Give expressions in SQL for the following queries.  
(a) Give all manager in this database, a 10-percent salary raise.  
(b) Find all companies located in every city in which small bank corporation in located.  
(c) Find the names of all employees who live in the same city as the company for which they work.
4. Explain with examples how key constraints, foreign key, constraints and general constraints can be enforced in SQL.
5. (a) Explain in detail about denormalization.  
(b) What do you mean by surrogate key.
6. (a) What do you mean by a transaction ? How can you ensure atomicity and durability?  
(b) Explain about conservative time stamp ordering mechanism.
7. (a) Explain about log based recovery system.  
(b) Explain in detail about remote backup system.
8. Explain in detail various RAID levels.

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1. (a) Distinguish between file processing system and database management systems.  
(b) What do you mean by data abstraction. Explain in detail data at various levels of abstraction.
2. What will generally be the data requirements of banking enterprise. From the data requirements identify entity sets and their attributes, and relationship sets and finally draw an ER diagram.
3. Consider the following schema.  
Sailors (sid:integer,sname:string,rating:integer,age:red )  
Boats ( bid:integer, bname: string , color :string)  
Reserver (sid: integer bid intiger day date)  
Write the following queries in SQL.
  - (a) Find the name of sailors who have received at least two boats.
  - (b) Find the sids of sailors with age over 20 who have not reserved a red boat
  - (c) Find the names of sailors who have reserved all boats.
  - (d) Find the names of sailors who have reserved all boats called Interlave
4. (a) List two reasons why are many choose to define a view.  
(b) List to major problem with processing update operations experienced in terms of viewa.
5. Explain in detail various normal forms.
6. Explain in detail various concurrency control mechanism using time streaming.
7. (a) Discuss in detail about buffer management.  
(b) Discuss about remote back up systems.
8. (a) Explain about bitmap indices  
(b) Explain about static hashing.

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**II B.Tech II Semester(R09) Regular Examinations, April/May 2011**  
**DATABASE MANAGEMENT SYSTEMS**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

**Time: 3 hours**

**Max Marks: 70**

**Answer any FIVE questions**  
**All questions carry equal marks**

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1. (a) What are the major disadvantages of file - processing systems.  
(b) What do you mean by a data model? Explain in detail various data models.
2. Construct an ER diagram for a car insurance company. That has a set of customers, each of whom owns one or more cars. Each car has associated with it zero to any number of recorded accidents.
3. (a) Illustrate with examples SQL constructs for creating and modifying relations.  
(b) What do you mean by a foreign key constraint. Illustrate with example how key constraints and foreign key constraints can be specified in SQL.
4. (a) What do you mean by a view? Explain how views enable data independence and ensure security.  
(b) List two major problems with processing update operations expressed in terms of views.
5. (a) How can we improve the database design using normalization.  
(b) Explain about denormalization.
6. (a) Explain about basic timestamp order concurrency control mechanism.  
(b) What do you mean by serializability? How can you test for serializability.
7. (a) Explain how log based recovery works.  
(b) Discuss about buffer management.
8. Illustrate with examples insertion and deletion operations of B+ trees.

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**II B.Tech II Semester(R09) Regular Examinations, April/May 2011**  
**OBJECT ORIENTED PROGRAMMING**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science  
& Engineering)

**Time: 3 hours**

**Max Marks: 70**

**Answer any FIVE questions**  
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1. (a) What is the need of OOP paradigm?  
(b) Write about agents of communities.
2. (a) How java is more secure than other languages?  
(b) What is data type? Explain data types in java.
3. (a) What is method overloading? Explain with an example.  
(b) Explain the usage of final and super keywords with an example.
4. What is a package? How do create a package? Explain about access protection in packages.
5. (a) What is an exception? Explain about exception handling mechanism in java.  
(b) Compare thread based and process based multitasking.
6. What is the task performed by layout manager? Explain different layout managers.
7. (a) What is an applet? Explain applet life cycle.  
(b) Write the difference between applet and stand alone applications.
8. (a) What is network programming? How are the different machines in a network addressed? Explain.  
(b) What is a part? What are the differences between port & socket? Explain with an example.

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**II B.Tech II Semester(R09) Regular Examinations, April/May 2011**  
**OBJECT ORIENTED PROGRAMMING**

(Common to Computer Science & Systems Engineering, Information Technology, Computer Science & Engineering)

**Time: 3 hours**

**Max Marks: 70**

**Answer any FIVE questions**  
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1. (a) Write about concept of responsibility in OOP.  
(b) Write about information hiding with respect to message passing.
2. (a) What is an empty statement? Explain its usefulness.  
(b) Compare in terms of their functionalities, the following pairs while and do-while.
3. (a) Can you declare abstract class members as final? Why?  
(b) Explain the following:
  - i. Abstract methods.
  - ii. Concrete methods.
4. (a) Explain about classes of java.util package.  
(b) Write the difference between class and interface.
5. (a) Explain the procedure to create user defined exceptions.  
(b) Why finally keyword is necessary in exception handling?
6. (a) What are the functionalities supported by java related to drawing ellipses?  
(b) What is event delegation model? Explain it.
7. (a) Explain briefly how to pass parameters to an applet.  
(b) Write the differences between applet and standalone applications.
8. Explain about various networking classes & interfaces available in java.

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1. (a) Briefly explain about abstract mechanism.  
(b) How to cope up with complexity? What are the mechanisms used to do so?
2. (a) Explain briefly about bitwise operators.  
(b) Explain the structure of java program with an example.
3. (a) What is multilevel inheritance? Explain with suitable example.  
(b) Explain how you can define constants in java. Explain with an example.
4. (a) Write a java program to demonstrate implementing two interfaces by single class.  
(b) Discuss java.util package in detail.
5. (a) Write a java program to implement runnable interface to create a thread.  
(b) Write short notes on Daemon threads.
6. Explain the following layout managers with a simple program.  
(a) Card layout managers.  
(b) Grid bad layout managers.
7. (a) What are mandatory attributes of applet tag? Explain them.  
(b) Write a program which draws dashed line and dotted line using applet.
8. (a) What is socket? What are the two important TCP socket classes? Explain.  
(b) Explore java.net package.

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1. (a) What is the difference between message passing and a procedure call?  
(b) Briefly write about OOP principles.
2. (a) Write a program to find the roots of quadratic equation.  
(b) What is type casting? What are the rules followed for type casting?
3. Explain the following:
  - (a) Super.
  - (b) Static members of class.
  - (c) Abstract methods Vs Concrete methods.
4. (a) Write a java program to find date and time.  
(b) What is the significance of CLASSPATH environment variables in creating loosing a package?
5. (a) Differentiate checked and unchecked exception.  
(b) What is thread? Explain thread life cycle.
6. (a) Write the difference between AWT components and SWING components.  
(b) Write short notes on inner class and adapter class.
7. (a) Write an applet program that display simple message “ ALL THE BEST”.  
(b) How do applets differs from application programs?  
(c) Write short notes on different types of applets.
8. (a) Discuss briefly about the following:  
TCP,UDP & URL  
(b) Write a client-server application that takes the password as input and check whether it is correct.  
The program should print the appropriate messages.

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**II B.Tech II Semester(R09) Regular Examinations, April/May 2011**  
**COMPUTER ORGANIZATION**

**(Common to Electronics & Computer Engineering, Computer Science & Engineering)**

**Time: 3 hours**

**Max Marks: 70**

**Answer any FIVE questions**  
**All questions carry equal marks**

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1. (a) What are the functional units? Explain each one.  
(b) Explain about different buses in a practical computer system and their implications on accuracy, precision and addressability.
2. Describe commonly employed bit shift operations such as shift left, right and arithmetic shift left/right. Design a circuit for register length of 4 bits using D flip-flops.
3. (a) Explain the variety of techniques available for sequencing of microinstructions based on the format of the address information in the microinstruction.  
(b) Hardwired control unit is faster than micro programmed control unit. Justify this statement.
4. (a) Draw a flowchart to explain how addition and subtraction of two fixed point numbers can be done. Also draw a circuit using full adders for the same.  
(b) Explain Booth's algorithm with its theoretical basis.
5. (a) Explain how the bit cells are organized in a memory chip.  
(b) Compare and contrast direct and associative mapping techniques.
6. (a) Explain bit oriented and character oriented protocols in serial communication.  
(b) What are the different issues behind serial communication? Explain.
7. (a) What is meant by instruction pipeline? Explain four segment instruction pipeline.  
(b) Give the timing diagram of instruction pipeline.
8. (a) Differentiate tightly coupled and loosely coupled multiprocessors according to hardware.  
(b) Explain the functioning of omega switching network with a neat sketch.

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**II B.Tech II Semester(R09) Regular Examinations, April/May 2011  
COMPUTER ORGANIZATION**

**(Common to Electronics & Computer Engineering, Computer Science & Engineering)**

**Time: 3 hours**

**Max Marks: 70**

**Answer any FIVE questions  
All questions carry equal marks**

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1. (a) What are the different performance measures used to represent a computer systems performance?  
(b) What do you mean by a parity bit? Explain with an example how even and odd parity bits are generated. Is it possible to correct errors using parity bits?
2. Mention about full adder circuit functionality with inputs and outputs using a block diagram. Using FA block design combined adder cum subtraction circuit. Assume two numbers are 4-bit numbers.
3. (a) What are the major design considerations in microinstruction sequencing.  
(b) Describe how microinstructions are arranged in control memory and how they are interpreted.
4. (a) Draw a flow chart which explains multiplication of two signed magnitude fixed point numbers.  
(b) Multiply 10111 with 10011 with the above procedure given (a). show all the registers content for each step.
5. Differentiate between paging and segmentation. Explain how the logical address will be translated to physical address in paging.
6. (a) What are the different types of I/O communication techniques? Give brief notes.  
(b) In the above techniques, which is the most efficient? Justify your answer.
7. Explain array processors. Explain SIMD array processor organization in detail.
8. What are the different kinds of Multi stage switching networks? Explain with neat sketch. Compare their functioning.

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1. (a) Explain about sign magnitude and 2's complement approaches for representing the fixed point numbers. Why 2's complement is preferable?  
(b) Design a 4-bit odd parity generator and checker. Can parity bit be used for error detection. If so how?
2. (a) Differentiate between RISC and CISC processors? Mention their advantages and disadvantages.  
(b) Which factors decides instruction format? Explain in detail.
3. (a) What are the major design considerations in microinstruction sequencing?  
(b) Explain about microinstruction sequencing techniques, specifically variable format address microinstruction.
4. (a) Explain how we can identify arithmetic overflow has occurred or not while adding/subtracting two signed numbers. Draw the circuit for performing addition/subtraction of two 4 bit numbers that checks the overflow.  
(b) Multiply 10111 with 10011 using booths algorithm.
5. Explain the following:
  - (a) Magnetic tape systems
  - (b) Optical Disc
  - (c) DVD technology
6. (a) Explain bit oriented and character oriented protocols in serial communication.  
(b) What are the different issues behind serial communication? Explain.
7. (a) What is pipeline? Explain space time diagram for pipeline.  
(b) Explain pipeline for floating point addition and subtraction.
8. (a) What is the functioning of cross bar switch network? Explain. With a neat sketch.  
(b) How many switch points are there in a cross bar switch network that connect 'p' Processors to 'm' memory modules.

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1. (a) Explain about various buses such as internal, external, back plain, I/O, system, address, data, synchronous and asynchronous.  
(b) Explain about daisy chain based bus arbitration.
2. (a) What is an interrupt? Explain about interrupt cycle in detail.  
(b) How do we classify CPU's based on their register organizations. In which organizations zero address instructions are used. Mention few zero address instructions and their actual execution in practice.
3. (a) Explain the terms control word, control memory, control address register and control buffer register.  
(b) Hardwired control unit is faster than micro programmed control unit. Justify this statement.
4. (a) Explain arithmetic overflow and divide overflow with some examples for 2' s complement numbers.  
(b) Explain Booth's algorithm with its theoretical basis.
5. (a) Show the memory hierarchy and give the brief explanation.  
(b) What is virtual Memory? What are the issues behind the usage of this technique?
6. What are the different kinds of I/O communication techniques? What are the relative advantages and disadvantages? Compare and contrast all techniques.
7. Write short notes on the following:
  - (a) RISC pipeline
  - (b) Vector processing
  - (c) Array processors.
8. (a) What is the need of inter processor synchronization? Explain.  
(b) Explain hardware lock mechanism.

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