



Reg. No. :

Name :

**VI Semester B. Tech. (Reg./Supple./Imp. – Including Part Time)
Degree Examination, July 2011
(2007 Admn.)**

2K6 CS/IT 602 : GRAPH THEORY AND COMBINATORICS

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all questions.

1. a) Define closed walk, open walk and path of a graph.
b) Explain subgraph and induced subgraph with an example.
c) Prove that for every tree $T = (V, E)$ if $|V| \geq 2$ then T has at least two pendant vertices.
d) Explain preorder traversal with an example.
e) Write a note on Rook polynomials.
f) Explain the rule of product with an example.
g) Find the coefficient of x^5 in $(1 - 2x)^{-7}$.
h) Solve the recurrence relation $a_n = 7a_{n-1}$ where $n \geq 1$ and $a_2 = 98$. (8×5=40)
 2. a) i) Explain Graph isomorphism. Give an example for isomorphic graphs. 7
ii) Explain the following :
I) Planar graphs
II) Complete Bipartite graph. 8
- OR
- b) i) Let K_n^* be a complete directed graph. That is K_n^* has 'n' vertices and for each distinct pair x, y of vertices, exactly one of the edges (x, y) or (y, x) is in K_n^* . Prove that such a graph always contains a Hamilton path. 8
ii) Explain Decomposition theorem for chromatic polynomials. 7

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2K6CS603 : DATABASE MANAGEMENT SYSTEMS

Time: 3 Hours

Max. Marks: 100

Instruction : Answer all questions.

1. a) Briefly explain any five characteristics of DBMS.
- b) Explain binary and ternary relationship with suitable example.
- c) Explain division operation of relational algebra with an example.
- d) Explain the concept of views.
- e) Explain single level and multi level indexing.
- f) Explain the terms track, sector, cylinder.
- g) Explain the steps of read and write operations of a transaction.
- h) Explain the concept of locks and dead lock problem. (8×5=40)

2. a) Define the terms :
 - i) Entity
 - ii) Instance
 - iii) Meta data
 - iv) Scheme. 10
- b) Mention any 5 DBMS interfaces. 5

- OR

3. a) Draw an E-R diagram for a Hotel having rooms and restaurant. Assume suitable attributes and relations. 10
- b) Explain single valued and multi valued attribute with example. 5

P.T.O.



4. a) Apply 1NF, 2NF and 3NF to the table. Assume suitable functional dependency **student** (Student number, student name, course number, course name, date of enrolment). 10

b) Explain the create table query with an example. 5

OR

5. a) Consider the table : 10

Sailor (sid, name, age) Boats (bid, bname, color) Reserves (sid, bid, day)

Write SQL query for the following :

i) Find the name of sailor reserved a red boat.

ii) Find the color of the boat reserved by 'Raghu'.

iii) Find the names of sailors who reserved at least one boat.

iv) List the names of boats which are reserved and the name starts with R.

v) List the different colors of the boats.

b) Explain inner join, outer join and union operations of relational algebra. 5

6. a) Explain RAID technology, how reliability and performance can be improved using RAID. 10

b) Explain NAS and SAN. 5

OR

7. a) Explain the structure and working of hard disk. 10

b) Write an algorithm for searching for a record with search key field value K using B⁺ tree. 5

8. a) Explain write ahead logging and how it is used in recovery. 8

b) Explain 2 phase and strict 2 phase locking. 7

OR

9. a) Explain the deadlock problem and a solution approach to this. 10

b) Explain ARIES recovery algorithm. 5



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2K6CS604 : COMPILER DESIGN**

Time: 3 Hours

Max. Marks: 100

Instruction : Answer all questions.

- I. a) What is LEX ? Explain the structure of LEX program with an example. 5
b) Explain the concept of passes and phases of compiler. 5
c) Write a note on YACC. 5
d) What is a grammar ? Also explain what do you mean by parse tree ? 5
e) What is syntax directed definition ? 5
f) What is heap allocation ? 5
g) Write a note on machine independent optimization. 5
h) What is Runtime error handling ? 5
- II. a) i) What is transition diagram ? Give a transition diagram for identifier and relational operator. 10
ii) What is the role of lexical analyser in compiler ? 5
- OR
- b) i) What are compiler construction tools ? Explain. 10
ii) What is regular expression ? Explain. 5
- III. a) Construct an SLR(1) parsing table for the following grammar :
 $S \rightarrow xAy \mid xBy \mid xAz$
 $A \rightarrow aS/q$
 $B \rightarrow q$ 15

OR

P.T.O.



- b) Construct an LL(1) parsing table for the following grammar. Also write the predictive parsing algorithm.

15

 $S \rightarrow aBDh$ $B \rightarrow cC$ $C \rightarrow bC/\epsilon$ $D \rightarrow EF$ $E \rightarrow g/\epsilon$ $F \rightarrow f/\epsilon$

- IV. a) i) Explain the translation scheme for checking the type of statements.
ii) Explain the issues of source language.

5

10

OR

- b) i) Explain the memory allocation in block structured languages.
ii) Explain the different type of intermediate code generation.

10

5

- V. a) i) Briefly explain the design issues of code generation.
ii) Explain the organization of a symbol table.

10

5

OR

- b) i) What are local and global optimizations ?
ii) Write a note on errors and recovery.

10

5



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2K6CS 605 : DATA COMMUNICATION AND COMPUTER NETWORK

Time : 3 Hours

Max. Marks : 100

I. Answer any 8 questions :

- 1) What are the three criteria necessary for an effective and efficient network ?
Explain each of them. 5
- 2) Explain the concerns of physical layer in the OSI model. 5
- 3) List five line coding schemes. Explain any one. 5
- 4) Discuss the concept of redundancy in error detection of error detection and correction. How does a single-bit error differ a burst error ? 5
- 5) "Bridges are self-learning." What is meant by that ? What are the steps in self-learning ? 5
- 6) What is the similarity between PPP and HDLC ? With a neat diagram explain the transition phases in a PPP connection. 5
- 7) Explain the three important functions of a network layer. 5
- 8) Write a short note on OSPF. 5
- 9) How do you achieve reliable data transfer over perfectly reliable channel ? 5
- 10) Draw a neat diagram of TCP segment. Explain sequence numbers and acknowledgment numbers. 5
- 11) Explain approaches to controlling congestion in the transport layer. 5

P.T.O.



- II. a) i) Define line coding. Describe unipolar NRz, Polar NRZ-L, Bipolar AMI and Manchester encoding by applying on the information sequence 101011100. 10
ii) Briefly explain the applications of optical fiber. 5

OR

- b) i) What is multiplexing ? With a neat diagram explain FDM. 7
ii) We have four sources each creating 250 characters/sec. If the interleaved unit is one character and 1 synchronous bit is added to each frame, find : (4×2=8)
a) The data rate of each source
b) The frame rate
c) The duration of each frame
d) The data rate of the link.

- III. a) i) What is CRC ? If the generating polynomial for CRC code is $x^4 + x^3 + 1$ and message word is 11110000, determine check bits and coded word. 8
ii) What is random access ? Explain CSMA/CD protocol. 7

OR

- b) i) Describe the frame format for IEEE 802.3 MAC frame. What are the salient features of FDDI network ? 10
ii) Bringout differences between repeaters and bridges. 5
- IV. a) i) Compare link state and distance vector routing algorithms. 8
ii) Discuss the approaches for determining the multi east routing tree. 7

OR

- b) Discuss RIP and OSPF routing algorithms in brief. 15
- V. a) Discuss the causes of congestion and approaches to deal with this in detail. 15

OR

- b) Discuss FTP and DNS in detail. 15
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2K6CS606 (A) : DISTRIBUTED COMPUTING

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all questions.

1. a) What is distributed system ? What are different characteristics of distributed systems ?
- b) Write a note on mobile and ubiquitous computing.
- c) What is distributed deadlock ? How it can be detected ? Explain.
- d) What are different distributed control models are available ? Give details of each.
- e) What is RPC ? Explain different steps involved.
- f) Write a note on transaction and concurrency control.
- g) Write a note on CORBA.
- h) What are various design and implementation issues of distributed shared memory ?

(8×5=40)

2. A) i) What is logical clocks ? Explain vector logical clock implementation. **10**
- ii) Explain one taken based algorithm for mutual exclusion. **5**

OR

- B) i) Explain any 4 issues of distributed system in detail. **10**
- ii) What is physical clocks ? How clock synchronization is done in distributed system ? **5**

P.T.O.



3. A) i) Explain WFG for deadlock detection. 5
ii) What are various agreement protocols ? Explain application of agreement algorithms. 10
OR
- B) Explain any one centralized and one distributed algorithm for deadlock detection. 15
4. A) i) What is concurrency control ? Explain the concept of timestamp ordering. 5
ii) What do you mean by nested transaction ? Explain the usage of locks in nested transactions. 10
OR
- B) i) Explain various communications between distributed objects. Explain with example. 5
ii) What do you mean by RPC ? With neat example explain the working of client-server procedures during RPC. 10
5. A) i) Write a note on two phase commit protocol. 8
ii) Write a note on distributed deadlock and transaction recovery. 7
OR
- B) i) What are various design and implementation issues of distributed shared memory ? 8
ii) Differentiate between Flat and nested transaction with suitable example. 7
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