8/12/2011 SE CMPN Sem-IV CBSGS DBMS

ws Sept-2011-169

Con. 6288–11.

MP–4339

(3 Hours) **[Total Marks : 100**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.

1. (a) What are the five main functions of a database administrator ? **5**
   (b) List all functional dependencies satisfied by the relation. **5**

A	B	C
a1	b1	c1
a1	b1	c2
a2	b1	c1
a2	b1	c3

   (c) Define the concept of aggregation. Give two examples of where this concept is useful. **5**
   (d) When a transaction is rolled back under timestamp ordering, it is assigned a new timestamp. Why can it not simply keep its old timestamp ? **5**

2. (a) Explain the following terms :– **10**
   (i) Data Independence (ii) Data Model
   (iii) Normalization (iv) Assertion.
   (b) What is view in SQL, how it is defined ? Discuss the problem that may arise when we attempt to update a view. How views are implemented ? **10**

3. (a) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. **10**
   (b) Explain concurrency control in Database system with the help of any two protocols. **10**

4. (a) List the three design goals for relational databases and explain why each is desirable. **10**
   (b) Explain organization of records in files. **10**

5. (a) List the ACID properties. Explain the usefulness of each. **10**
   (b) Compare shadow page recovery scheme with log based recovery scheme. **10**

6. (a) Explain the following relational algebra operations with examples :– 10

(i) Generalized Projection (ii) Set Intersection

(iii) Natural Join (iv) Assignment.

(b) Consider the employee database where the primary keys are underlined. Give an expression in SQL for the following queries : 10

employee (**employee-name**, street, city)

works (**employee-name**, company-name, salary)

company (**company-name**, city)

manages (**empolyee-name**, manager-name)

(i) Find all employees in the database who earn more than each employee of Small Bank Corporation.

(ii) Find all employees in the database who do not work for First Bank Corporation.

(iii) Find all employees who earn more than the average salary of all employees of their company.

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

7. Write short notes on :– 20

(a) Data Dictionary Storage (b) Authorization in SQL

(c) Insertion of entry in a B^+ tree (d) Stored procedures.

13/12/11 SE EMBN Sem-IV (R) Computer Graphics

Con. 6520-11. **MP–4333**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No.**1** is **compulsory**.
(2) Attempt any **four** out of remaining.
(3) Assume **suitable** data if **necessary** and **justify** the assumptions.
(4) **Figure** to the **right** indicate **full** marks.

Que. 1.**(a)** Differentiate between Random Scan and Raster Scan display. [05]
(b) Show that the composition of two successive rotation are additive i.e. $R(\theta_1).R(\theta_2) = R(\theta_1+\theta_2)$. [05]
(c) Explain the Real time animation and frame by frame animation. [05]
(d) Explain the Back face removal algorithm. [05]

Que. 2.**(a)** Write a line clipping algorithm which uses parametric form of equation. Test it for line P_1P_2 where $P_1 = (10, 10)$ and $P_2 = (60, 30)$ against the window with $(Xwmin, Yw_{min}) = (15, 15)$ and $(Xwmax, Yw_{max}) = (25, 25)$ [10]
(b) Explain Gouraud and Phong shading with its advantages and disadvantages [10]

Que. 3.**(a)** Write the mid point circle algorithm. Using mid point circle algorithm Plot the circle whose radius = 10 units. [10]
(b) Explain parallel and perspective projections. Derive the matrix for Perspective projection. [10]

Que. 4.**(a)** Write short note on Bezier curve with its properties. [10]
(b) Consider the line L and triangle ABC. The equation of line L is $Y = \frac{1}{2}(X+4)$ and A(2,4), B(4,6), C(2,6). Reflect the triangle about line L. [10]

Que. 5.**(a)** Write pseudo codes for boundary fill and flood fill procedure [10]
(b) Explain Sutherland Hodgmann polygon clipping algorithm with example. [10]

Que. 6.**(a)** Derive the matrix for 2-D Rotation about an arbitrary point. [10]
(b) What is Display file structure? Hence explain the need for display file interpreter. [10]

Que. 7. Write a short notes on the following **(any four)**: [20]
(a) Fractals
(b) Dithering technique
(c) Color Models
(d) Half Toning
(e) Ray tracing
(f) Segments.

22/12/11 S.E (comp) Sem IV.

43: 2nd Half-Exam.-11 mina (d).

Analysis of Algorithm and Design.

Con. 6785-11.

MP-4342

(3 Hours) **[Total Marks : 100**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Out of remaining **6** questions, attempt any **4** questions.
(3) In all **5** questions to be **attempted**.

Q.1. (a) Compare the time complexities of the following algorithms giving their complexities in terms of big – O , Ω , θ. **05**

(i) Quick sort (iii) Heap sort

(ii) Shell sort (iv) Insertion sort.

(b) .State the applications of the Graph Theory. **05**

(c) State advantages and disadvantages of recursion. **05**

(d) Write a routine to delete a word from a tries. **05**

Q.2. (a) What is Hamiltonian Cycle? Write an algorithm to find all Hamiltonian cycles. **10**

(b) Calculate variable length Huffman code for following frequencies **10**

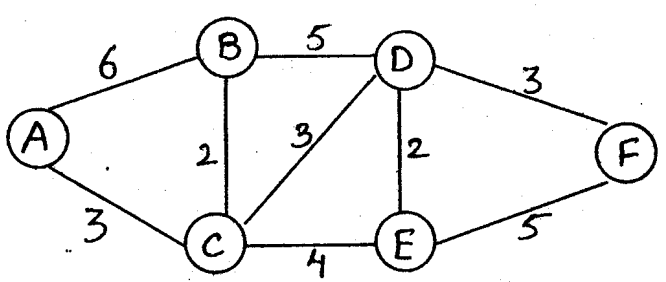
A = 2, B = 6, C = 4, D = 15, E = 7, F = 22, G = 9, H = 17.

Q.3. (a) Explain 8-queen problem. Write an algorithm using backtracking to solve this problem. **10**

(b) Explain graphing coloring algorithm with an example. **10**

Q.4. (a) Write an algorithm for 0/1 knapsack problem using dynamic programming approach. **10**

(b) Find the minimum cost spanning tree for the following graph using Prim's algorithm. **10**



[TURN OVER

Q.5. (a) What is Travelling Salesman Problem? How to solve the same problem using Branch and Bound? Explain with example. **10**

(b) Sort the following list of elements in ascending order using merge sort technique. Give the output of each pass. **10**

90 20 80 89 70 65 85 74.

Q.6. (a) Write functions to implement DFS and BFS graph searching methods. **10**

(b) To implement the binary search, prove that the complexity of binary search is $O(\log_2 n)$. **10**

Q.7. Write short note on: **20**

(a) Randomized Algorithms

(b) Divide and Conquer Strategy

(c) Optimal Storage on Tape

(d) Strassen's Matrix Multiplication.

L SE CMPN Sem - IV CBSD

A & D C

17 | 22 : 2nd half.11-AM(f)

Con. 6643-11. **MP-4327**

(3 Hours) **[Total Marks : 100**

N.B. : (1) Question No. 1 is **compulsory.**
(2) Attempt any **four** questions from the remaining **six** questions.
(3) Answer to questions should be **grouped** and written **together.**

1. (a) An AM signal appear across a 50 Ω load and has the following equation —
$V(t) = 10 (1 + \text{Sin } 2\pi \times 10 \times 10^3 t) \text{ Sin } 4\pi \times 10^6 t$
(i) Calculate the modulation index, side band frequencies, total power and band width. 6
(ii) Sketch the envelope of SSB signal in time domain. Also draw the spectrum of SSB signal. 4
(b) Draw the block diagram of Armstrong Frequency Modulation System and explain its working. 10

2. (a) What are the various pulse modulation techniques ? Give one method for the generation of PAM. 10
(b) Compare TDM with FDM. 5
(c) Explain TDM in detail. 5

3. (a) Draw neat block diagram of Delta modulator and explain its working. What are the drawbacks of delta modulator and how are they overcome by ADM. 10
(b) Draw a neat block diagram and waveforms for PCM transmitter and receiver and explain the working. 10

4. (a) Explain :— (i) Shanon Hartley Capacity theorem. 10
(ii) Intersymbol Interference and equalization.
(b) Explain Matched filter and optimum receiver. 10

5. (a) Explain the QAM Transmitter and Receiver. 10
(b) Explain the functioning of BPSK (Binary Phase Shift Keying) Transmitter and Receiver with the help of a neat diagram. 10

6. (a) The generator matrix of (6, 3) systematic block code is given by — 10

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

(i) Find the Code Vectors
(ii) Find the Parity Check Matrix
(iii) Find the error syndrome.
(b) Write a short note on the following :—
(i) Viterbi Algorithm 5
(ii) Cyclic Code. 5

7. Write short notes on any **three** of the following :— **20**

(a) Line Codes
(b) Thermal Noise
(c) Eye Pattern
(d) Image frequency and its rejection
(e) Sampling theorem for lowpass band limited signal.

27/12/11 SE CMPN IV CREV OS

Con. 6914-11. **MP-4336**

(3 Hours) **[Total Marks : 100**

N. B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remaining **six** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume **suitable** data if **required**.

1. (a) What is Operating System ? Explain different functions and objectives of operating system. **10**
   (b) Differetiate between Monolithic kernel and microkernel. **5**
   (c) Explain different system calls of operating system. **5**

2. (a) What is Thread ? Explain different types of threads in detail, compare process and thread. **10**
   (b) What is mutual exclusion ? Give software approaches for mutual exclusion. **10**

3. (a) What is Process Management ? Explain various states of process with neat diagram. Also explain all process state transitions. **10**
   (b) Five processes are assumed to have arrived in order P_1, P_2, P_3, P_4, P_5 all at time 0. The burst time and priority is given for each process :— **10**
      (i) Draw Gantt charts using FCFS, STF and priority scheduling. (Smaller number implies higher priority).
      (ii) What is waiting time and turn around time for each process ?
      (iii) Which of the above scheduling algorithms results in minimal average waiting time ?

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

4. (a) What is deadlock ? How to handle deadlock ? 10
   (b) Explain different disk scheduling algorithms with example. 10

5. (a) Calculate the hit and miss using various page replacement methods. (LRU, OPTIMAL, FIFO) for following page frames sequence, (Page frame size 3). 10
   4, 7, 3, 0, 1, 7, 3, 8, 5, 4, 5, 3, 4, 7.
   (b) Explain Unix file system in detail. 10

6. (a) What is Virtual Memory ? Explain with neat digram translation of virtual address into physical address in segmentation. 10
   (b) Explain I/O buttering in detail. 10

7. Write short notes on (any **four**) :— 20
   (a) RAID
   (b) Semaphores
   (c) Producer-consumer Problem
   (d) RTOS-Real Time Operating System
   (e) Mointor.
