Advanced Database Management + Systems.
ME / Comp / II

Con. 3628-12.

BB-3125

25/5/12

(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) **Figures** to the **right** indicate **full** marks.

Q1 [A] Give the rules for converting ER schema to EER schema 10

[B] 10

T1	T2	T3	T4
R(y)			
	R(x)		
R(x)			
	R(y)		
		R(y)	
			R(x)
	W(y)		
			R(y)
W(x)			

a. Draw the precedence graph.

b. Determine whether the schedule is conflict serializable. If it is then list the equivalent serial schedule.

Q2. ABC Engineering College is graded A college. It is five departments. The departments are headed by senior most & qualified faculty. The placement of final year students from all branches is managed by placement centre. Placement centre is managed by one of the faculty from any department. The teaching load of that faculty is zero. To assist placement centre head there are placement secretaries (whose teaching load is 13) from each department along with placement assistance from students (selected by placement center) of all five departments. Placement centre is responsible for on –campus & off campus recruitment of students. The placement process requires students resume & relevant documents along with approval from placement centre. Companies invited on campus conduct test followed by interviews. The criteria of selection depend on academic performance & interview. For off–campus placements placement centre head must accompany students to the venue. 20

(i) Draw EER diagram

(ii) Draw class diagram

(iii) Write 5 suitable queries in OQL.

Q3 [A] In database explain what are locks, basic two phase locking (2PL), conservative 2PL, strict 2PL and rigorous 2PL. 10

[B] 10

T1	T2
	Begin_transaction
Begin_transaction	Read(x)
Read(x)	x=x*2
x=x+20	Write(x)
Write(x)	commit
commit	

(a) What is the lost update problem? Are the transactions above affected by the lost update problem? Fully explain your answer.

(b) If the transactions are affected by a lost update problem, rewrite them using 2PL to overcome it.

Q4 [A] Give the rules for converting EER schema to OODB schema 10

[B] Explain Apriori Algorithm with example 10

Q5 [A] Find out the data transfer cost of distributed query processing for following queries. "For each employee, retrieve the employee name and name of the department for which employee works." 15

Site 1 :

Employee									
Fname	Minit	Lname	SSN	Bdate	Address	Sex	salary	SSSN	DNo

10000 records
each record is 100 bytes long.
SSN field is 10 bytes Fname is 20 bytes
DNo field is 5 bytes Lname is 15 bytes

Site 2 :

Department			
Dname	Dnumber	Mgrssn	Mgrstartdate

100 records
each record is 35 bytes long
Dnumber field is 4 bytes Dname 10 bytes
mgrssn is 9 bytes.
Query is submitted to result site 3. Consider different strategies for executing this query and find which strategy is best using natural join and semijoin.

[B] Write Basic Timestamp Ordering Algorithm. 05

Q6 Consider a banking system where each bank has multiple branches and each branch can have multiple account and loan. 20

a. Give the ER Diagram
b. Prepare the XML Schema.
c. Write X-Query to retrieve all the customer's name having loan amount more than 4 lakhs.
d. Write X-path to retrieve all the customer's name having account balance equals to Rs. 1000 /-

Q7 Write short notes on the following : 20

a. Data Warehousing
b. Temporal Databases
c. Mobile Databases
d. GIS applications

ME | CMPN | II CRED 21|5|12
Distributed operating systems

30 : 1st half.12-AM(s)

Con. 3075-12. **BB-3122**

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

N.B. : (1) Question No. **1** is **compulsory**.
(2) **Out of remaining** questions, attempt any **four** questions.
(3) Draw neat labeled **diagram** wherever **necessary**.
(4) Answers to **each** new questions to be **started** on a **fresh page**.

Qu.1 a) Define Distributed Operating System(DOS). What are different issues in the design of a DOS 10

b) What are the necessary and sufficient conditions for mutual exclusion? How is mutual exclusion achieved using semaphores. 10

Qu.2 i) Discuss the UNIX i-node structure 20
ii) Give the byte capacity of a file for all the classes if the clock size is assumed to be 1K.
iii) What is the maximum number of bytes that can be held in a file in this structure ?
iv) Convert virtual address 67108800 to (block no., offset) pair.

Qu.3 a) Differentiate between :- 10
i) Stateless and state full server
ii) DOS and NOS.

b) Explain the working of EDF and RMA real time scheduling algorithms. 10

QU.4 a) What is a Consistent and Transitless global state of a distributed system? Discuss Chandy-Lamport Global State Recording algorithm. 10

b) What are the different methods for scheduling processors in distributed systems. Explain how the centralized algorithms allocated processors fairly. 10

Qu. 5 a) Discuss the vector clock timestamp deciding algorithm with an example. 10

b) With the help of suitable example , explain Byzantine general problem to get agreement in faulty system. 10

Qu.6 a) Discuss sender initiated and receiver initiated heuristic algorithms for processor Allocation in distributed system. Which of these is more optimal for heavy loads and why? 10

b) Explain the following terms: 10
i) Effective Deadline and effective release time
ii) Event triggered versus time triggered systems.

Qu.7 Write a short note on (any two): 20
i) Fault tolerance and its significance
ii) Windows NT
iii) Message passing primitives.

ME/CMPN1 II 30/5/2012
Advances in Management Information

Con. 4107-12. BB-3134

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. 1 is compulsory.

(2) Solve any four questions out of the remaining six questions.

1. (a) What are the five components of an Information System? Explain with example of a university system. (10M)

(b)Explain the classification of information systems with examples. (10M)

2. (a) Explain the five forces that determine the survival of a firm in competitive environment. Also discuss the five strategies to combat these forces. (10M)

(b) Explain the value chain concept of a firm. (10M)

3. (a) What is Customer Relationship Management? Explain types of CRM. (10M)

(b) Explain Enterprise Resource Planning in detail. (10M)

4. (a) What is e-commerce? Explain the three basic categories of e-commerce with examples.(10M)

(b) Explain the systems approach to problem solving . (10M)

5. (a) What do you understand by structured, unstructured and semi-structured decisions? (10M)

(b) What is information? Explain characteristics of quality information. (10M)

6. (a) What are the various kinds of reports produced by MIS? Explain. (10M)

(b) What are the different analytical models of DSS? Explain. (10M)

7. (a) Differentiate between : (10M)

1) DSS and MIS.

2) BPR and Business Improvement

(b) What do you understand by Enterprise Information Systems? Explain. (10M)

ME | CMPN | II 4|6|2012

Image Processing

VT-F.H.Exam. April-12-62

Con. 3135–12. **BB–3140**

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

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** out of remaining **six** questions.
(3) Assumptions made should be **clearly** stated.
(4) Assume **suitable** data wherever **required** and justify **same**.
(5) **Figures** to **right** indicates **full** marks.
(6) Illustrate answer with **sketches** wherever **required**.

1. (a) Fundamental steps in Digital Image processing. 5
   (b) Image Restoration. 5
   (c) FFT Algorithms. 5
   (d) Texture Analysis. 5

2. (a) Give the details on Uniform and Non-uniform sampling and quantization. 10
   (b) Prove that the magnitude of determinant of a unitary transform is unity. Also show that all the eigen values of a unitary matrix have unity magnitude. 10

3. (a) A binary image contains straight lines oriented horizontally, vertically, at 45° and at –45°. Give a set of 3 × 3 masks that can be used to detect 1-pixel breaks in these lines. Assume that the intensities of the lines and background are 1 and 0 respectively. 10
   (b) Compare the image transforms cosine, Hadamard, Haar, Sinusoidal and KL transforms. 10

4. Take a 512 × 512 image containing noise. Design Low-pass, Band pass, and High pass zonal masks in different transform domains such that their passbands contain equal energy. Map the three filtered images into R, G, B color components at each pixel and display the resultant Pseudocolor image. 20

5. (a) Consider a checker board image composed of alternating black and white squares, each of size m × m. Give a position operator that would yield a diagonal co-occurrence matrix. 10
   (b) Explain various image descriptions. 10

6. For 512 × 512 image of your choice, design DPCM coders using mean square predictors of orders up to four. Implement the coders for B = 3 and compare the reconstructed images visually as well as on the basis of their mean square errors and entropies. 20

7. Write short notes on following :– 20
   (a) Properties of DFT
   (b) Frequency Domain Methods
   (c) Variable Length Coding
   (d) Edge Linking and Boundary Detection.

ME | CMPN | II(R) | 6 | 5 | 12
Software Engg.

Con. 3528–12.

BB–3119

(3 Hours)

[Total Marks : 100

N. B. 1) Question No. 1 is compulsory.
2) Attempt any four out of remaining six questions.
3) Figures to the right indicate full marks.

Q.1. a) Discuss various Software Engineering problems. 10

b) Calculate COCOMO effort, TDEV, average staffing, and productivity for an organic project that is estimated to be 39,800 line of code. 10

Q.2. a) What are the different models produced during software requirement analysis? Explain in detail. 10

b) Explain Transform mapping and Transaction mapping. 10

Q.3. a) Explain software configuration management plans. 10

b) Give different steps involved in Architectural Design. 10

Q.4. a) The author uses interactive sessions when he teaches a course that includes distance learning students. The author divides the students into teams and posts a problem on the web page. The teams work on the problem using chat rooms, ask question of the instructor using a message board, and submit the solution via email. The instructor then grades the solution using a grading point sheet. Draw a process model for the interactive session. 10

b) Explain object oriented project metrics and estimation. 10

Q.5. a) Compare CMM and ISO 9001. 10

b) Explain Object Oriented Design Methodology. 10

Q.6. a) Write note on Verification and Validation Techniques 10

b) What are the major challenges to software Engineering? Explain SQA. 10

Q.7. a) Explain different debugging approaches and different system testing. 10

b) Write and Explain IEEE standards for SQA plan. 10