Con. 5575–10. (REVISED COURSE) GT–7683

(3 Hours) [Total Marks : 100

T.E./I.T./Sem-VI/Rev. 22/12/2010

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

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

Prog. for Mobile & Remote Computer

1. (a) Explain the life cycle of midlet. 10
   (b) Write a note on MVC architecture. 10

2. (a) Design a canvas based MIDP application which generates concentric circles from smallest to largest circle on click of command button. 10
   (b) What is Event handling ? Elaborate its types in J2ME. 10

3. (a) What are JDBC drivers, state its types and elaborate each of them. 10
   (b) Explain the life cycle of servlet. 10

4. Write a note on :– 20
   (a) Obfuscator
   (b) Bluetooth Architecture
   (c) Configurations and Profiles
   (d) Alerts in MIDP Applications.

5. Design a calculator using high level components to perform basic operations of addition, subtraction, multiplication and division. 20

6. Write a note on :– 20
   (a) Deployment Descriptor
   (b) Web Container
   (c) Components of Web Application
   (d) EJB Centric Web Application.

7. (a) Describe any two frameworks supported by JEE 5. 10
   (b) State the steps for packaging and deployment of MIDlet. 10

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TE/IT/Sem VII/Rev DT

4-12-(

Con. 5796–10. **(REVISED COURSE)** **GT–7689**

(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) Explain the following terms : **5**
   (i) Data Warehouse (ii) Inheritance
   (b) Explain 3NF with suitable example. **5**
   (c) Explain Data Fragmentation in distributed Database **5**
   (d) Explain Transient and Persistent objects. **5**

2. (a) What are triggers ? Give an example. Illustrate the cases when triggers must not be used. **10**
   (b) Explain design and implementation issues in mobile databases. **10**

3. (a) Explain various extended features of ER diagram such as aggregation, specialization and generalization with suitable example. **10**
   (b) Find out the data transfer cost of distributed query processing for following queries. **10**
   "For each employee, retrieve the employee name and name of the department for which employee works."

   Site 1
   Employee

Fname	Minit	Lname	SSN	Bdate	Address	Sex	Salary	SSSN	DNO

   10,000 records, each record is 100 bytes long.
   SSN field is a bytes, Fname is 15 bytes
   DNO field is 4 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 field is 10 bytes
   Mgrssn field 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.

Con. 5796–GT-7689-10.

4. (a) Consider relation R (PQRSTU) with following dependencies. **10**

$P \longrightarrow Q$, $ST \longrightarrow PR$, $S \longrightarrow U$

State R is in which normal form ? Decompose it to BCNF. Show step by procedure.

(b) Explain object identifier and object structure with example. **10**

5. (a) All electronics company have sales dept. Sales consider four dimensions namely time, item, branch and location. The schema contain a central fact table sales with two measures dollar_sold and unit sold. **10**

Design star schema and snowflake schema.

(b) Consider a data warehouse for a hospital, where there are three dimensions. **10**
(i) Doctor (2) Patient and (3) Time and two measures : (i) Count and (ii) Charge, where charge is the fee that the doctor charges a patient for a visit. using the above example describe the following OLAP operations.

(1) Slice (2) Dice (3) Rollup (4) DrillDown.

6. (a) Explain type of constraints with an example. **10**

(b) Explain security and Authorization in SQL. **10**

7. Write short notes on (any **four**) :— **20**

(a) Comparison of RDBMS, OODBMS, ORDBMS

(b) SQL3 standard

(c) Comparison between OLTP and OLAP

(d) Two phase committ protocol

(e) Temporal Databases.

TE/IT/Sem VI /Old
DS.

P4-Exam.-Oct.-10-67

Con. 5720–10. **(OLD COURSE)** **GT–7402**

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

1. (a) Design an EER schema for a private airport that is used to keep a track of airplanes, their owners, airport employees and pilots. From the requirements of this database, the following information was collected. **10**
Each airplane has a registration number. It is of a particular type and is stored in a particular hanger. Each plane type has a model number, a capacity and a weight. Each hangar has a number, a capacity and location. The database also keeps track of the owners of each plane and employees who maintain the plane. Each plane undergoes a service many times. Owner can be a person or corporation. Incorporate other attributes as needed in you schema.

   (b) Consider following relational schema :– **10**
Employee (empno,name,office,age)
Books (isbn,title,authors,publisher)
Loan (empno,isbn,date)
Write the following in relational algebra :–
   (a) find names of employees who have borrowed a book published by "wiley"
   (b) find names of employees who have borrowed all book published by "wiley"
   (c) find names of employees who have borrowed more than five different books published by "wiley"
   (d) for each publisher, find names of employees who have borrowed more than five books of that publisher.

2. (a) Let R (A, B, C) and let r_1 and r_2 both be relations on schema R. Give an expression in SQL that is equivalent to each of the following queries. **10**
   (i) $r_1 \cup r_2$
   (ii) $r_1 \cap r_2$
   (iii) $r_1 - r_2$
   (iv) $\Pi_{AB}(r_1) \bowtie \Pi_{BC}(r_2)$

   (b) Explain strict two phase locking. What are its advantages and disadvantages ? **10**

3. (a) What are deadlocks ? How are they prevented ? **10**

   (b) What is conflict serializability ? Explain with suitable example. **10**

4. (a) Consider the following relation for published books. **10**
BOOK (Book_title, Authorname, Book_type, Listprice, Author_affil, Publisher)
Author_affil refers to affiliation of the author. Suppose the following dependencies exist.
Book_title → Publisher,Book_type
Book_type → Listprice
Authorname → Author_affil
   (i) Explain what normal form is the relation in.
   (ii) Apply normalization until further decomposition is not possible. State reasons behind each decomposition.

   (b) Explain Boyce-Codd Normal Form. How does it differ from 3NF ? Why is it considered stronger form of 3 NF ? **10**

[TURN OVER

5. (a) Explain Log Based recovery in detail with suitable example. 10

   (b) Explain Buffer Management in Recovery System. Explain how buffer manager may cause the database to become inconsistent if some log records pertaining to a block are not output to stable storage before block is output to disk. 10

6. (a) Design an OO schema for an Airport database. Create corresponding classes in ODL. Specify methods for each class. 10

   (b) Describe the following :– 10

   (i) Iterator variables
   (ii) Views (named queries)
   (iii) Aggregate functions
   (iv) Database entry points
   (v) Quantifiers.

7. Write short notes on the following (any **four**) :– 20

   (a) Triggers and Assertions in SQL
   (b) Functional Dependency
   (c) Validation based protocols
   (d) Embedded SQL
   (e) Constraints and characteristics of specialization and generalization.

T.E/ IT/ Sem VI / Rev
Middle ware & Enterprise Integration

VT-Oct-10-8

Con. 5567–10. **(REVISED COURSE)** Teeh **GT–7686**

(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) List the issues to be considered in the design of distributed object systems. **10**
   (b) Explain in detail the different type of client/server architecture with neat diagrams. **10**

2. (a) State the characteristics of RPC middleware. Explain RPC mechanism. **10**
   (b) Explain the process of RMI using stubs/proxy/skeletons. **10**

3. (a) What is CORBA ? Explain its architecture and various services provided by it. **10**
   (b) Differentiate JavaBean with EJB. **10**

4. (a) Explain working of DCOM. **10**
   (b) Compare CORBA, DCOM and RMI. **10**

5. (a) What are the functions of Enterprise Service Bus. State its advantages and disadvantages. **10**
   (b) Explain the role of XML in Web Services. **10**

6. (a) Describe the structure of WSDL file. State the importance of UDDI. **10**
   (b) What are the challanges in SOA. **10**

7. Write short notes on any **two** of the following :– **20**
   (a) Simple Object Access Protocol (SOAP)
   (b) BPEL for Web Services
   (c) Message Queues
   (d) Types of Servers.

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T.E. / IT / Sem VI

185 / p3-ksl-upq-Sec Half-KL-9-10 Information Technology for Management Enterprise

Con. 6705-10. **(REVISED COURSE)** **GT–7692**

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

N. B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** of the remaining **six**.
(3) Write brief answers with **suitable** diagrams and **tables**.

1. Justify with reasons any **four** of the following statements. **20**
   (a) Inter Organizational Information system activities support efficient interaction between organizations at a reasonable cost.
   (b) Main components of a knowledge Management system are : communication, collaboration and storage technologies.
   (c) Web Mining is useful in market research and competitive intelligence.
   (d) Internet has changed the traditional relationships between customers, suppliers and firms in industry.
   (e) Benefits of outsourcing include reduction of IT costs while allowing the management to concentrate on core competencies combined with the possibility of security risk.
   (f) Web mining is useful in market research and competitive intelligence.

2. (a) What are the main objectives, components and benefits of digital economy ? **10**
   (b) Discuss the major models of E-business from E-Government to CZC. **10**

3. (a) Why are the ethical and legal issues in E-business important and briefly mention the major managerial issues in E-Commerce. **10**
   (b) Describe with an example the implementation of ERP. **10**

4. (a) What are the benefits of emerging computing environments, SaaS, SOA and Mobile computing ? **10**
   (b) Explain Partner relationship management and collaborative commerce. **10**

5. (a) Explain the characteristics, capabilities and advantages of automated decision support systems. **10**
   (b) What are the different stages in the Nolon's I.T. growth model ? **10**

6. (a) What are the principles, Challenges and opportunities of supply chain management ? **10**
   (b) Give a case study example of Data, Warehouse, Network computing and Wireless devices in a business environment. **10**

7. Write short notes on any **three** :— **20**
   (a) Business Process Management
   (b) Role of RFID in a demand driven supply chain
   (c) Various levels of customer relationship management
   (d) Productivity Paradox of I.T.

T.E/ IT/ Sem VI / Rev
Middle ware & Enterprise Integration

VT-Oct-10-8

Con. 5567–10. **(REVISED COURSE)** Teeh **GT–7686**

(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) List the issues to be considered in the design of distributed object systems. **10**
   (b) Explain in detail the different type of client/server architecture with neat diagrams. **10**

2. (a) State the characteristics of RPC middleware. Explain RPC mechanism. **10**
   (b) Explain the process of RMI using stubs/proxy/skeletons. **10**

3. (a) What is CORBA ? Explain its architecture and various services provided by it. **10**
   (b) Differentiate JavaBean with EJB. **10**

4. (a) Explain working of DCOM. **10**
   (b) Compare CORBA, DCOM and RMI. **10**

5. (a) What are the functions of Enterprise Service Bus. State its advantages and disadvantages. **10**
   (b) Explain the role of XML in Web Services. **10**

6. (a) Describe the structure of WSDL file. State the importance of UDDI. **10**
   (b) What are the challanges in SOA. **10**

7. Write short notes on any **two** of the following :– **20**
   (a) Simple Object Access Protocol (SOAP)
   (b) BPEL for Web Services
   (c) Message Queues
   (d) Types of Servers.

TE/IT/Sem VI (Rev)
Sub- I & NS

30/11/10

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Con. 6146–10. **(REVISED COURSE)** **GT–7677**

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

N.B.: (1) Question No.1 is **compulsory**.
(2) Attempt any **four** out of remaining **six** questions.
(3) Assume suitable data if necessary and state the assumptions clearly.

Q1. (a) What are the attacks in information transfer? Also write the security services used to prevent these attacks. **05**
(b) How AES is better than DES? **05**
(c) Compare ACL with C-List **05**
(d) Explain Session Hijacking. **05**

Q2. (a) Explain RSA cryptosystem in detail. **10**
(b) Explain Network layer attacks. Discuss Packet Sniffing in detail **10**

Q3. (a) What is symmetric key cryptography? Explain A5/1 algorithm. **10**
(b) Discuss Denial of Service Attack with its causes, preventive and reactive measures. **10**

Q4. (a) Discuss various categories of malware and ways to detect them. **10**
(b) Explain different types of Firewalls. At which layer of Internet Protocol stack do each operate? **10**

Q5. (a) Explain Cryptographic hash function and explain Tiger hash in detail **10**
(b) What are the security policies used by banks during the time of disaster **10**

Q6. (a) Discuss different biometric means used for Authentication. Compare them with password authentication. **10**
(b) Compare Signature based and Anomaly based IDS with suitable examples. **10**

Q7 .Write notes on any **three** of the followings: **20**
(i) Knapsack cryptosystem
(ii) Covert channel
(iii) Risk Analysis
(iv) Web Server vulnerabilities.

TE/IT/ sem VI Rev

Software Engineering

P4 Con No-101

Con. 5808–10. **(REVISED COURSE)** **GT–7680**

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

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** out of remaining **six** questions.
(3) Marks for **each** question are given in **brackets** at the **right** hand side.

1 A) Explain process and project metrics. (5)

B) What are the projects best suited for agile methodology and why? (5)

C) Identify the risks in web based application development. (5)

D) When do you prototype? What are the outcomes of prototyping? (5)

2 A) Explain the steps in requirement engineering. (10)

B). What do you understand by process maturity? Mention the activities in CMM level 4 and 5. (10)

3 A) How are efforts estimated? In which phase of development cycle effort estimation done? (10)

B) What are the risks associated with delayed projects? How do project managers manage such risks? (10)

4 A) State the five major tasks in SCM. How is version control done? (10)

B) Describe the activities done during FTR, Configuration Audit and status reporting. (10)

5 A) Explain cohesion and coupling and the purpose of modular design. (10)

B) Relate the data flow and control flow diagram with an example case study of your choice. (10)

6 A). What are the advantages of test-driven development? (5)

B) State Software quality factors. (5)

C). Describe the different techniques in white box testing (10)

7. Write short notes on any two : (2 x 10)

A) Security engineering

B) Project scheduling and tracking

C) System Testing.

29 Dec 2010

T.E. / IT / Sem VI

Digital Signal Processing

Con. 5582–10. (OLD COURSE) GT–7395

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions of remaining **six** questions.
(3) Assume **suitable** data if **required**.

1. (a) Explain various discrete time sequences which come across in the analysis of digital filter. 10

(b) Find the transfer function and sketch magnitude and phase spectra whose unit sample response is given by ,

$h(0) = -1$, $h(1) = 1$, and $h(n) = 0$ otherwise 5

(c) Find N-point DFT of

$x(n) = e^{j2\pi n}$ 5

(d) Check the causility of first order recursive filter

$y(n) = a\, y(n-1) + x(n)$ 5

2. (a) Find the convolution of two sequences

$x(n) = 1$ for $-3 \le n \le 3$
$= 0$ otherwise

$h(n) = 1$ for $0 \le n \le 6$
$= 0$ otherwise 10

(b) Find 8-point DFT using DITFFT algorithm with butterfly diagram for

$x(n) = \{ 1, 1, 1, -1, 1, -1, 1, 1 \}$ 10

3. (a) Determine the Z-transform with ROC for

$x(n) = \alpha^n$ 5

(b) Give the steps in designing digital filter. 5

(c) Determine the order and poles of low pass Butterworth filter that has -3 dB bandwidth of 500 Hz and attenuation of 40 dB at 1000 Hz. 10

4. (a) Implement the digital filter in Z-domain whose unit sample response is given as

$h(n) = r^n \sin(\omega_0 n)$ for $n \ge 0$
$= 0$ otherwise 5

(b) Sketch the pole-zero pattern for

$$H(z) = 1-z^{-8}$$ 5

(c) Explain in detail various methods of converting analog filters into digital Filters. 10

5. (a) For the following magnitude and phase function compute Z-transform. Sketch the pole zero pattern and draw the filter block diagram.

$$| H(e^{j\omega}) | = [5 + 4 \cos(2\omega)]^{1/2}$$

$$\text{Arg } [H(e^{j\omega})] = \arctan (-\sin 2\omega / 2 + \cos 2\omega)$$ 10

(b) Convert the following filter using impulse invariant transformation

$$H_a(s) = s + 0.1 / ((s + 0.1)^2 + 9)$$

into digital IIR filter. 10

6. (a) Give the different properties of z-transform. 5

(b) Prove that convolution operation is commutative. 5

(c) Give the difference between structures of Direct Form I and Direct Form II of digital filters. 10

7. (a) With the help of neat block diagram compare and contrast IIR and FIR filters 10

(b) Write short notes on (Any Two) : 10

(i) Discrete Fourier transform.
(ii) Unilateral Z-transform
(iii) Hilbert Transform.

TE / IT / Sem-VI / old

Software Engineering

P4 Con No -78

Con. 5807–10. **(OLD COURSE)** **GT–7398**

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

N.B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** out of remaining **six** questions.
(3) Marks for **each** question are given in **brackets** at the **right** hand side.

1 A) Differentiate evolutionary and incremental software process model? (10)

B) Explain Process metrics, Process Framework and Process maturity. (10)

2 A) What are functional and non-functional requirements? Explain the steps in requirement engineering? (10)

B) Briefly state with examples the characteristics of good software requirements specification (SRS) document. (10)

3 A) What are proactive and reactive risks? How would you mitigate the risk in highly interactive application development? (10)

B) Mention the important steps in project scheduling? Can you identify the tasks if delayed would lead to schedule over –run? Justify your answer. (10)

4 A) State why requirements change. How is change control done in software projects. (10)

B) Describe the activities done during FTR, Configuration Audit and status reporting. (10)

5 A) State the principles of software design. Explain cohesion and coupling. (10)

B) Relate the artifacts produced in analysis and design. (10)

6 A) Evaluate cyclomatic complexity for binary search program. Write the pseudo code, flow graph and calculate CC (10)

B) Describe the different techniques in black box testing. (10)

7. Write short notes on any two : (2 x 10)

A) COCOMO model

B) Software quality assurance

C) Software maintenance.

T.E / IT / Sem VII

 Information Technology for Management

Con. 6705-10. **(REVISED COURSE)** Enterprise **GT–7692**

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

N. B. : (1) Question No. **1** is **compulsory**.
(2) Answer any **four** of the remaining **six**.
(3) Write brief answers with **suitable** diagrams and **tables**.

1. Justify with reasons any **four** of the following statements. **20**
   (a) Inter Organizational Information system activities support efficient interaction between organizations at a reasonable cost.
   (b) Main components of a knowledge Management system are : communication, collaboration and storage technologies.
   (c) Web Mining is useful in market research and competitive intelligence.
   (d) Internet has changed the traditional relationships between customers, suppliers and firms in industry.
   (e) Benefits of outsourcing include reduction of IT costs while allowing the management to concentrate on core competencies combined with the possibility of security risk.
   (f) Web mining is useful in market research and competitive intelligence.

2. (a) What are the main objectives, components and benefits of digital economy ? **10**
   (b) Discuss the major models of E-business from E-Government to CZC. **10**

3. (a) Why are the ethical and legal issues in E-business important and briefly mention the major managerial issues in E-Commerce. **10**
   (b) Describe with an example the implementation of ERP. **10**

4. (a) What are the benefits of emerging computing environments, SaaS, SOA and Mobile computing ? **10**
   (b) Explain Partner relationship management and collaborative commerce. **10**

5. (a) Explain the characteristics, capabilities and advantages of automated decision support systems. **10**
   (b) What are the different stages in the Nolon's I.T. growth model ? **10**

6. (a) What are the principles, Challenges and opportunities of supply chain management ? **10**
   (b) Give a case study example of Data, Warehouse, Network computing and Wireless devices in a business environment. **10**

7. Write short notes on any **three** :— **20**
   (a) Business Process Management
   (b) Role of RFID in a demand driven supply chain
   (c) Various levels of customer relationship management
   (d) Productivity Paradox of I.T.

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29 Dec 2010

T.E. / IT / Sem VI / old

Digital Signal Processing I

Con. 5582–10. (OLD COURSE) GT–7395

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions of remaining **six** questions.
(3) Assume **suitable** data if **required**.

1. (a) Explain various discrete time sequences which come across in the analysis of digital filter. 10

(b) Find the transfer function and sketch magnitude and phase spectra whose unit sample response is given by ,

$h(0) = -1$, $h(1) = 1$, and $h(n) = 0$ otherwise 5

(c) Find N-point DFT of

$x(n) = e^{j2\pi n}$ 5

(d) Check the causility of first order recursive filter

$y(n) = a\, y(n-1) + x(n)$ 5

2. (a) Find the convolution of two sequences

$x(n) = 1$ for $-3 \le n \le 3$
$= 0$ otherwise

$h(n) = 1$ for $0 \le n \le 6$
$= 0$ otherwise 10

(b) Find 8-point DFT using DITFFT algorithm with butterfly diagram for

$x(n) = \{ 1, 1, 1, -1, 1, -1, 1, 1 \}$ 10

3. (a) Determine the Z-transform with ROC for

$x(n) = \alpha^n$ 5

(b) Give the steps in designing digital filter. 5

(c) Determine the order and poles of low pass Butterworth filter that has -3 dB bandwidth of 500 Hz and attenuation of 40 dB at 1000 Hz. 10

4. (a) Implement the digital filter in Z-domain whose unit sample response is given as

$h(n) = r^n \sin(\omega_0 n)$ for $n \ge 0$
$= 0$ otherwise 5

(b) Sketch the pole-zero pattern for

$$H(z) = 1 - z^{-8}$$ 5

(c) Explain in detail various methods of converting analog filters into digital Filters. 10

5. (a) For the following magnitude and phase function compute Z-transform. Sketch the pole zero pattern and draw the filter block diagram.

$$| H(e^{j\omega}) | = [5 + 4 \cos(2\omega)]^{1/2}$$

$$\text{Arg } [H(e^{j\omega})] = \arctan (-\sin 2\omega / 2 + \cos 2\omega)$$ 10

(b) Convert the following filter using impulse invariant transformation

$$H_a(s) = s + 0.1 / ((s + 0.1)^2 + 9)$$

into digital IIR filter. 10

6. (a) Give the different properties of z-transform. 5

(b) Prove that convolution operation is commutative. 5

(c) Give the difference between structures of Direct Form I and Direct Form II of digital filters. 10

7. (a) With the help of neat block diagram compare and contrast IIR and FIR filters. 10

(b) Write short notes on (Any Two) : 10

(i) Discrete Fourier transform.
(ii) Unilateral Z-transform
(iii) Hilbert Transform.

Con. 5794–10. (OLD COURSE) VI IT GT–7287

(3 Hours) [Total Marks : 100

DBMS

N.B. : (1) Question No. 1 is **compulsory**.
(2) Answer any **four** out of remaining **six** questions.
(3) Answers to **sub** questions must be written **together**.

1. You have to design and implement a database that manages information about publishers, authors, and books. Some information includes :
• A publisher has a name and an address for the headquarters. Each publisher also has a set of branches, each branch having an address and two phone numbers.
• An author has a name and an address.
• A book is published by a publisher and has a list of authors associated with it. An author can publish several books and a book can be published by at most one publisher.

a) Draw an Extended Entity-Relationship diagram (5)
b) Specify an object-relational database schema that suitably represents the above properties. Use object-relational features (user-defined data types, object tables, references, nested tables, . . .) whenever suitable. Use SQL 3 (10)
c) Write a SQL 3 query for the following query :
List the name of the author who has published the most books with publisher "McGraw Hill" (5)

2.(a) Compare and contrast Parallel and distributed databases. (10)
(b) Consider an airline database that keeps track of passenger reservations on different flights. Design Object Oriented Schema for the system (10)

3.The city central library wants to put up its list of books on the web, so that members can order books online.
(a) Discuss the design such a web database. (10)
(b) Describe XML schemas for the database (10)

4.(a) Consider the global schema:
PATIENT (Number, Name, SSN, Amount_Due, Dept, Doctor, Med_treatment)
DEPARTMENT (Dept, Location, Director)
STAFF (Staffnum, Director, Task)
1) Show 2 examples of horizontal fragmentation
2) Show 2 examples of vertical fragmentation
3) Show 2 examples of derived fragmentation (5 * 3 =15)

(b) Describe in brief the design and implementation issues for temporal databases (5)

5. (a) Describe with example the need for data warehousing. (10)
(b) Define Data Mining. Describe any two data mining algorithms. (10)

6. Explain the following concepts with examples:
(a) Object Identity (OID)
(b) Type constructor
(c) Persistent data types
(d) Accessor functions (GET and SET) (5 * 4 = 20)

7. Write detailed notes on :
a) Spatial Databases
b) Mobile Databases. (10 * 2 = 20)