Total No. of Questions : 12] [Total No. of Pages : 2

P1226

[3564] - 344
B.E. (Computer Engineering)
DISTRIBUTED SYSTEMS
(2003 Course) (410451)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables, slide rule, mollier charts, electronic pocket calculator and steam table is allowed.***
5) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Compare between multiprocessor operating system, multicomputer operating system, network operating system and middleware based distributed systems. **[10]**

b) Explain different levels in client server application with suitable example. **[8]**

OR

Q2) a) Explain different transparencies in distributed system with suitable examples. **[6]**

b) Explain in detail middleware models and services provided by middleware. **[6]**

c) Explain variations on the client-server model in distributed system. **[6]**

Q3) a) Explain how quality of service can be achieved in stream oriented communication. **[10]**

b) Explain different forms of communication in message oriented communication. **[6]**

OR

Q4) a) Explain general architecture of message queuing system for persistent communication. **[8]**

b) Explain different RPC models in detail. **[8]**

Q5) a) Explain fault tolerant issues in NFS. **[8]**

b) Explain principle of log based striping in xFS with diagram. **[4]**

c) How Coda solves read-write conflicts on a file that is shared between multiple readers and only a single writer? **[4]**

P.T.O.

OR

Q6) a) Compare the following distributed file systems: Coda, xFS, **[8]**

b) Explain the difference between name server and directory server with examples. **[4]**

c) How DNS can be used to implement a home based approach to locating mobile hosts? **[4]**

SECTION - II

Q7) a) Explain how the causality can be captured by means of vector timestamps. **[8]**

b) Explain how NTP (network time protocol) is useful to distribute time over the Internet, also state the features of NTP. **[6]**

c) Explain ring algorithm with suitable example. **[4]**

OR

Q8) a) Compare Centralized, Distributed and Token Ring algorithms of mutual exclusion. **[8]**

b) Explain how Lamport timestamp can be used in totally-ordered multicasting. **[6]**

c) Compare Cristian and Berkeley algorithms of clock synchronization. **[4]**

Q9) a) Explain different classes of failures that can occur in the RPC systems. **[8]**

b) Consider a Web browser that returns an outdated cached page instead of a more recent one that had been updated at the server. Is this a failure, and if so, what kind of failure? **[8]**

OR

Q10) a) Explain n-army problem with possible solution, **[8]**

b) In the two-phase commit protocol, why can blocking never be completely eliminated, even when the participants elect a new coordinator? **[4]**

c) Explain how the write-ahead log in distributed transactions can be used to recover from failures. **[4]**

Q11) a) Explain CORBA ORB Architecture. **[8]**

b) Explain the elements of Grid Computing systems. **[8]**

OR

Q12) a) Compare Grid Computing and Cluster computing. **[4]**

b) Explain different types of Clusters with examples. **[6]**

c) Explain the steps to build CORBA application in brief. **[6]**

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Total No. of Questions : 12] [Total No. of Pages :3

P1299

[3564] - 348
B.E. (IT)
INFORMATION SYSTEM SECURITY
(2003 Course) (414441)

Time : 3 Hours] *[Max. Marks:100*

Instructions to the candidates:

1) ***Attempt not more than 6 questions of which at least 3 questions must be from each Section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Your answers will be valued as a whole.***
6) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
7) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) What are the differences between message confidentiality and message integrity. Can you have one without other? Justify? **[6]**

b) What is the difference between an active and passive intruder. **[6]**

c) What is the man-in-the-middle attack. Can this attack occur when symmetric keys are used. **[6]**

OR

Q2) a) Compare and contrast : public key system Vs symmetric key system. **[6]**

b) Suppose that an intruder has an encrypted as well as decrypted version of the message can the intruder mount a ciphertext attack only, a known plaintext attack or a chosen plaintext attack. **[6]**

c) Explain various methods of obtaining the IP address of a remote machine. **[6]**

Q3) a) What is the difference between closed network and open network. Define a security policy. Name three reasons why a company should have security policy. Write a security policy for password protection. **[10]**

b) Distinguish between : Chinese wall model and Bell-Lapadula Model. **[6]**

OR

P.T.O.

Q4) a) Name and explain in brief at least four key components that a good security policy should contain. **[5]**

b) Name the two philosophies that can be adopted when defining a security plan. Which individuals should be involved when creating a security policy. **[5]**

c) Explain Biba Model. What is DAC. **[6]**

Q5) a) Give an example of two factor authentication. **[5]**

b) Using RSA choose p=3 and q=11, and encode the word "hello". Apply the decryption algorithm to the encrypted version to recover the original plaintext message. **[5]**

c) What is the purpose of nonce in an authentication protocol? What does it mean to say that a nonce is a once-in-a-lifetime value? **[6]**

OR

Q6) a) Explain -

Transposition ciphers.

Avalanche effect. **[8]**

b) Define -

Viruses, Worms, Rabbits, Bacteria and Logic bombs.

Explain the mechanisms of defence against malicious logic codes or programs. **[8]**

SECTION - II

Q7) a) In what way does a public key encrypted message digest provide a better digital signature than using the public key encrypted message. **[6]**

b) What does it mean for a signed document to be verifiable, nonforgeable and nonrepudiable. **[6]**

c) What is a key distribution center. What is a certificate authority. **[6]**

OR

Q8) a) In what way does a message digest provide a better message integrity check than a checksum such as the internet checksum. **[6]**

b) Consider the KDC and CA servers, suppose a KDC goes down, what is the impact on the ability of parties to communicate securely, that is, who can and cannot communicate. Justify your answer. Suppose now that a CA goes down, what is the impact of failure. **[6]**

c) Distinguish between strong and weak collision resistance in message digest algorithms. **[6]**

Q9) a) What are the four major functions of IPSec. **[5]**

b) There are two main IPSec framework protocols available. State their names and give a brief explanation of what they do. **[5]**

c) Describe briefly how IPSec works. **[6]**

OR

Q10) a) Both ESP and AH can be applied to IP packets in two different ways. List those two modes and explain the difference between them. **[6]**

b) What is i) authentication ii) authorization & iii) accounting used for. **[5]**

c) List two weaknesses of the signature base IDS. **[5]**

Q11) a) List and explain four phases of SSL. **[8]**

b) Discuss firewall design principles. Explain what firewall can do and what firewall cannot. **[8]**

OR

Q12) a) In context of kerberos what is realm. **[8]**

b) What are the five principle services provided by PGP. **[8]**

Total No. of Questions : 8] **[Total No. of Pages : 2**

P1273

[3564]-92
B.E. (IT)
ENTERPRISE RESOURCE PLANNING (ERP)
(1997 Course) (410445)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates:

1) ***Answer any three questions from each section.***
2) ***Answers to the two sections must be written on separate answer books.***
3) ***Assume suitable data, if necessary.***
4) ***Draw sketches wherever necessary.***
5) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) What is an enterprise? What is ERP? What are the facilities, which form "multi-facility" environment of ERP? **[8]**

b) Discuss about various resources that ERP needs to manage? Enlist the application domains where ERP can be implemented. **[8]**

Q2) a) What are tangible and non-tangible benefits of ERP? **[8]**

b) Why is ERP an asset? Explain it with suitable examples. **[8]**

Q3) a) How is ERP implemented? Discuss step-wise procedure of implementation in details. **[8]**

b) What are different core processes in automobile sector? Explain their importance in accordance with ERP. **[8]**

Q4) Write short notes on :- **[18]**

a) Material management.

b) Role of consultants in implementation of ERP.

c) Intelligent recourse planning.

SECTION - II

Q5) a) Enlist any two major vendors in ERP market. Discuss their one product each in details. **[8]**

b) What is gap analysis? What are post-implementation options? **[8]**

P.T.O.

Q6) a) Explain what are order-winners & qualifiers with suitable examples. **[8]**

b) Why is there a need to understand the markets to implement ERP solution? **[8]**

Q7) a) Explain ERP sales cycle in details. **[8]**

b) How is ERP package evaluated? Discuss with suitable examples. **[8]**

Q8) Write short notes on :- **[18]**

a) Technology Management.

b) HR Management.

c) Failure to ERP systems.

Total No. of Questions : 12] **[Total No. of Pages :4**

P1236

[3564] - 359
B.E. (I.T.)
REAL TIME SYSTEM
(2003 Course) (Elective)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates:-

1) ***In section - I attempt question No. 1 or 2, 3 or 4, 5 or 6 and section - II attempt question No. 7 or 8, 9 or 10,11 or 12.***
2) ***Answer 3 questions from section - I and 3 questions from section - II.***
3) ***Answers to the two sections should be written in separate books.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Figures to the right indicate full marks.***
6) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Describe the classification of a real time system with suitable example. What are the issue in real time computing. **[6]**

b) Consider the landing portion of the flight of a civilian aircraft. The aircraft has an automatic landing system, which allows it to land even in zero visibility weather at suitable equipped airport. If the automatic landing feature on the aircraft is not working when the landing phase begin, and if the destination airport has low-visibility weather, the aircraft is diverted to another airport. It is assumed that an alternative airport with sufficient visibility to permit a manual landing can always be found with in the range of aircraft. We assume that when ever a manual landing is possible, the automatic landing feature is dispensed with and the aircraft is landed manually. If the automatic landing feature fail during automatic landing, there is a crash. **[10]**

i) Find accomplishment level.

ii) Using Hierarchical view of performance, Find performability of given system.

OR

Q2) a) What is performability? Explain with suitable example. In what way it is different then tranditional measure of performance. **[6]**

b) What are the various factor, that are to be consider while estimating the program run time in real time system. Describe analysis of source code, drive lower bounds and upper bounds for suitable example. **[10]**

P.T.O.

Q3) a) Explain in detail rate-monotonic scheduling algorithm. What is the necessary and sufficient condition for RM-schedulability. Explain with suitable example. **[8]**

b) Describe the classification of IRIS (Increase Reward with Increase Service) task. Explain any one in detail. **[6]**

c) Consider the following set of task arrival to a system. **[4]**

Task	Arrival Time	Execution Time	Absolute Deadline
T_1	0	10	30
T_2	4	3	10
T_3	5	10	25

Assigned all the task using preemptive Earliest Deadline First (EDF)

OR

Q4) a) Write short notes on (any two) : **[10]**

i) Fault Tolerant Scheduling Algorithm.

ii) Buddy Strategy for task Assignment.

iii) Myopic offline Scheduling (MOS) Algorithm.

b) Consider the following set of periodic task

Task	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}
Execution Time (ms)	5	7	3	1	10	16	1	3	9	17	21
Period (ms)	10	21	22	24	30	40	50	55	70	90	95

These task are to be scheduled on a three processor system. Assigned all the task using A Bin-Packing Assignment Algorithm for EDF. **[8]**

Q5) a) Explain use of POSIX programming API in Real time system. With any eight API. **[8]**

b) State the assumption made for the implementation of the adaptive earliest deading (AED). By what method are the transaction assigned to the HIT/MISS groups? How are the transaction in HIT group and those in MISS group scheduling. **[8]**

OR

Q6) a) Differentiate Real time database and general purpose database. **[4]**

b) Why are main memory database faster then disk based database for single processor? **[4]**

c) What is optimistic concurrency control? Describe the following policies related to the optimistic algorithm in the presence of transaction priorities.

i) Sacrifice policy.

ii) Wait policy. **[8]**

SECTION - II

Q7) a) Explain difference between CSMA, VTCSMA. **[6]**

b) What do you mean by wormhole routing? Consider and draw a network is a three dimension hypercube. A message is to be sent from node 000 to node 111. **[8]**

Assume - The packet consists of six flits and destination at time 7

Show the transmission from node 000 to node 111 using flits.

c) Describe Fault Tolerant routing? **[4]**

OR

Q8) a) Draw neat block diagram of different real time network and different real time topologies. Explain its advantage and disadvantage. **[8]**

b) What do you mean by network architecture issues? Why those issue are different then general purpose system. **[6]**

c) Describe the dead-line-based protocols. **[4]**

Q9) a) Explain in details capability of RTlinux along with specific API for time services. **[8]**

b) Describe which scheduling algorithm is used in RTlinux as against standard linux. **[4]**

c) Explain in detail timer function support in RTlinux, where it is used. **[4]**

OR

*Q10)*a) Explain in detail capability of VX works along with specific API for time service. **[8]**

b) Explain in detail what is interrupt latency? **[4]**

c) Explain in detail asynchrous timer function support in VXworks and where it is used. **[4]**

Q11)a) Describe the classification of faults according to their behavior. Explain 'Fault and Error containment zone' **[6]**

b) Explain the reliability models for hardware redundancy. **[6]**

c) Write short notes on (any one) : **[4]**

i) Time Redundancy.

ii) Data diversity.

OR

Q12)a) Describe the following structures for hardware redundancy. **[8]**

i) Static Pairing.

ii) Shift-out Redundancy.

b) Describe in detail Fault-Tolerant synchronization in hardware and Fault-Tolerant synchronization in software. **[8]**

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Total No. of Questions : 12] **[Total No. of Pages :2**

P1234

[3564] - 357
B.E. (I.T.)
INFORMATION RETRIEVAL
(2003 Course)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates:-

1) ***Answer question 1 or 2, 3 or 4, and 5 or 6 from section - I and question 7 or 8, 9 or 10, and 11 or 12 from section - II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) With the help of Block diagram explain typical Information Retrieval System. **[8]**

b) Explain Single Pass Algorithm. **[8]**

OR

Q2) a) What are the advantages & disadvantages of Conflation Algorithm? State any other algorithm for deriving document representative **[8]**

b) Describe the various classification methods based on the relations between properties, classes and object. **[8]**

Q3) a) Describe the Boolean & Vector Model **[8]**

b) Explain the XML Data Model and XML Query. **[8]**

OR

Q4) a) Explain Multilist and Cellular Multilist file structure implemented in IR System. **[8]**

b) Explain Cluster based retrieval. **[8]**

Q5) a) Explain TREC document collection, tasks and Evaluation measures at TREC Conferences. **[10]**

b) What are the different starting points for search interfaces? **[8]**

P.T.O.

OR

Q6) a) Explain precision and recall. Consider set Rq is containing relevant documents for query Q. The set Rq is composed of following documents: {d1, d9, d12, d31, d42, d54, d67, d78, d91, d100} Answer set for a new retrieval algorithm is as follows {d42, d99, d100, d71, d63, d9, d44, d19, d22, d67, d3, d6, d87, d30, d78} Evaluate the retrieval performance of the algorithm. **[10]**

b) Explain Information Access Process. **[8]**

SECTION - II

Q7) a) Describe the various challenges for effective deployment of Digital Library. **[8]**

b) Write a note on : Online Public Access Catalogs. **[8]**

OR

Q8) a) Explain various document models its representations and access. **[8]**

b) Write a note on SQL3 and Online Retrieval Systems. **[8]**

Q9) a) Elaborate the characteristics of the query language used in multimedia IR systems. **[8]**

b) Explain in detail GEMINI approach. **[8]**

OR

Q10)a) Explain how GEMINI is applied for color images. **[8]**

b) Explain MULTOS data model. **[8]**

Q11)a) Describe the MIMD architecture with respect to parallel IR. How inverted file is used for MIMD. **[10]**

b) Explain the crawler-indexer architecture. **[8]**

OR

Q12)a) Explain distributed IR with the help of collection partitioning, source selection and query processing. **[10]**

b) Explain Meta Searches with examples. **[8]**

■■■■

Total No. of Questions : 12] **[Total No. of Pages :3**

P1233

[3564] - 356
B.E. (I.T.)
DISTRIBUTED SYSTEMS
(2003 Course) (414449)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates:-

1) ***Answer question 1 or 2, 3 or 4, & 5 or 6 from Section - I and question 7 or 8, 9 or 10, and 11 or 12 from Section - II.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Discuss the challenge of scalability while designing Distributed Systems. **[9]**

b) Explain with the help of an application, what is spontaneous networking. **[9]**

OR

Q2) a) Give two examples of applications, which are suitable for distributed systems than parallel systems. Comment whether they meet design challenges. **[9]**

b) It is said that distributed systems have "no global clock". Do you agree with this? Why? **[9]**

Q3) a) What is cloning? How can RMI be made to use blocking semantics? **[8]**

b) Describe any four RPC call semantics. **[8]**

OR

Q4) a) Write short notes on (any two) : **[8]**

i) Stubs.
ii) Marshalling and demarshalling.
iii) Binding of an object.

b) What are message channels and message channel agents (MCA)? Explain the attributes associated with MCAs. **[8]**

P.T.O.

Q5) a) Explain immutable file sharing semantics. Can a file system work if it supports above mentioned semantics. Prove your answer. **[8]**

b) Explain any four record types in DNS. **[8]**

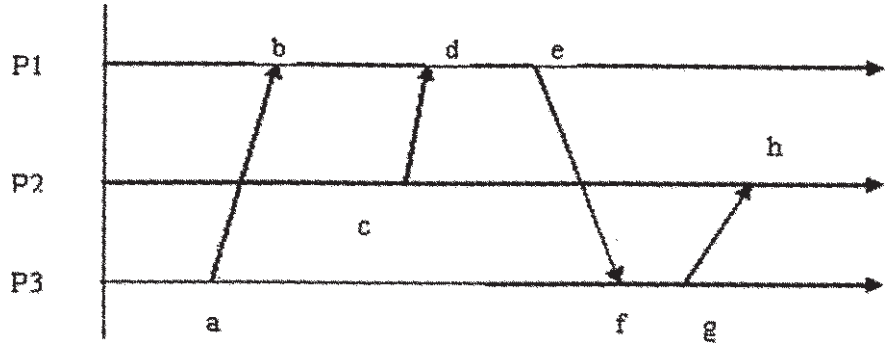
OR

Q6) a) Explain xFS. **[8]**

b) Explain how reference counting helps in removing unreferenced entities. **[8]**

SECTION - II

Q7) a) Show vector timestamps for the following events : **[8]**



b) Explain how Berkeley algorithm synchronizes clocks. **[8]**

OR

Q8) What is marker sending and receiving rule? Does the snapshot algorithm always give consistent global state? Explain. **[16]**

Q9) a) Explain : **[12]**

i) FIFO-ordering.
ii) Causal ordering.
iii) Total-ordering.
iv) No ordering.

b) Explain Scalable Reliable Multicasting. **[6]**

OR

Q10)a) Why is group communication important? How is it implemented in distributed systems? **[9]**

b) What is negative acknowledgement? What is feedback implosion? How does it create problem in distributed systems? **[9]**

Q11)a) What are the design considerations of GRID computing? **[8]**

b) Write a note on Cluster of Workstations. **[8]**

OR

Q12)a) Write any four applications where GRID computing is used. **[8]**

b) Discuss how CORBA supports naming. **[8]**

■■■■

Total No. of Questions : 6] **[Total No. of Pages :2**

P1232

[3564] - 354
B.E. (IT)
ORGANISATIONAL BEHAVIOUR & MANAGEMENT CONCEPTS
(2003 Course) (Elective - I) (Theory) (414445)

Time : 3 Hours] ***[Max. Marks:100***

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate maximum marks for that question.***
3) ***Answers to the two sections must be written in two separate answer books.***
4) ***Q3 & Q6 are compulsory.***

SECTION - I

Q1) Explain the historical development of organisational behaviour and state its elements. **[16]**

OR

Define motivation. Explain basic motivational process.

Q2) Mention various theories of motivation. Explain vector Vroom's expectancy theory. **[16]**

OR

Explain various causes and effects of stress.

Q3) Write short notes on any three : **[18]**

a) Team effectiveness.

b) Conflict management.

c) Frustration.

d) Perception.

e) Models of OB.

P.T.O.

SECTION - II

Q4) What is organisational structure? Explain matrix structure giving its advantages and disadvantages. **[16]**

OR

Explain in detail the managerial grid style.

Q5) Discuss "changes in technology may result in changes in tasks, structure or people". **[16]**

OR

Discuss "Re-engineering is one of the essential tasks of modern managers".

Q6) Write short notes on any three : **[18]**

a) Down sizing.

b) Constructive conflict.

c) Organisational culture.

d) Resistance to change.

e) Learning organisations.

Total No. of Questions : 12] [Total No. of Pages :2

P1231

[3564] - 353
B.E. (IT)
GIS & REMOTE SENSING
(2003 Course)

Time : 3 Hours] *[Max. Marks:100*

Instructions to the candidates:

1) ***Answer 3 questions from each section.***
2) ***Answers to the two sections must be written on separate answer books.***
3) ***Assume suitable data if necessary.***
4) ***Draw sketches wherever necessary.***
5) ***Figures to the right indicate full marks.***

SECTION - I

Q1) a) What is GIS? What are the four M's of GIS? Enlist the contributory disciplines to GIS. **[8]**

b) What are Maps? Give the classification of Maps. **[8]**

OR

Q2) a) What is map projection? Describe different types of map projections. **[8]**

b) What is grid system? Which grid systems are used in the GIS applications? **[8]**

Q3) a) What are the key elements of visual image interpretation? **[8]**

b) Describe the image enhancement techniques used in processing of remote sensed data. **[8]**

OR

Q4) a) What are different types of product media used in remote sensing? Enlist the details that are annotated on the satellite imagery. **[8]**

b) Explain the pre-processing correction methods used in processing of remote sensed data. **[8]**

Q5) a) What are different sensor parameters? Describe them with examples. **[9]**

b) Classify earth resource satellites. Describe any two series of satellites. **[9]**

P.T.O.

OR

Q6) a) Define remote sensing. What are the advantages of computer analysis in remote sensing? **[9]**

b) Describe the electromagnetic spectrum along with Maxwell's theory and Quantum theory. **[9]**

SECTION - II

Q7) a) How is GIS used in urban and municipal applications like land use or land cover classification system? **[8]**

b) Explain the issues in integration of remote sensing with GIS. **[8]**

OR

Q8) a) What are the challenges of urbanization? Is there any role for GIS in dealing with these challenges? **[8]**

b) Explain data processing in GIS applications with desired steps and a suitable example. **[8]**

Q9) a) Describe the data types and their sources used for GIS in India. **[8]**

b) What are different types of accuracies used in GIS? **[8]**

OR

Q10) a) What are the common errors in GIS databases? How can they be prevented or corrected? **[8]**

b) Explain the process of Digital Terrain Modeling (DTM) with the tasks involved. **[8]**

Q11) a) What is vector data representation? Explain it with suitable example. **[9]**

b) What are the different ways to built GIS real world model? **[9]**

OR

Q12) a) What is spatio-temporal data? Explain different types of representations used for spatio-temporal data. **[9]**

b) What are the functions of DBMS supporting GIS applications? **[9]**

Total No. of Questions : 11] [Total No. of Pages :3

P1229

[3564] - 350
B.E. (IT)
SOFTWARE TESTING AND QUALITY ASSURANCE
(2003 Course)

Time : 3 Hours] *[Max. Marks:100*

Instructions to the candidates:

1) ***Answer three questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Define any 4 of the following terms **[8]**

i) Failures ii) Faults iii) Test Bed iv) Defects
v) Errors vi) Software Quality.

b) Differentiate software validation and software verification. **[8]**

OR

Q2) a) What type of skill do you believe should be required of a person being hired as a test specialist? **[8]**

b) Differentiate white box testing & black box testing. **[8]**

Q3) a) Explain unit test planning in details. **[8]**

b) Describe the software defect life cycle. **[10]**

OR

Q4) a) Explain in details different functions (responsibilities) to be handled in a testing life cycle or process. **[8]**

b) Draw control flow graph for the code given below. Clearly label each node so that it is linked to its corresponding statement. Calculate its cyclomatic complexity. How can this value be used to measure testability? Describe how cyclomatic complexity number and the flow graph be used to design a set of white box tests for this module that would at least cover all its branches. **[10]**

P.T.O.

```
module foo()  /* a[ ] and b[ ] are global variables * /
    begin
        int i , x
        i = 1
        read (x)
        while (i < x) do begin
        a[i] = b[i] * x
        if a[i] > 50 then
                print ("array a is over the limit")
        else
                print ("ok")
        i = i+ 1
        end
        print ("end of nonsense")
    end.
```

Q5) a) Explain the importance of the metric - *percentage delinquent fixes* in context with software maintenance. **[8]**

b) Explain with examples following in-process quality metrics. **[8]**

i) Defect arrival pattern during machine testing..

ii) Defect removal effectiveness.

OR

Q6) a) Explain with example the GQM method for identifying software measures. **[8]**

b) Define measurement & explain in details the representation condition for measurement. **[8]**

SECTION - II

Q7) a) What are the resources required for Usability testing? Explain some metrics to measure software usability. **[8]**

b) Enumerate Ishikawa's Seven Basic Quality Tools. Explain any two in details. **[8]**

OR

Q8) a) What does SQA ensure? What are the goals of SQA activity? **[8]**

b) What is meant by software quality control? Explain the method of measuring software reliability as a software quality attribute. **[8]**

Q9) a) Explain the role of effective software configuration management in software quality. **[8]**

b) Explain with example the six-sigma measure of software quality. **[8]**

OR

Q10) a) How does the ISO 9000/9001 standard ensure in producing a good quality software? **[8]**

b) Explain the KPA's of CMM Level 4. **[8]**

Q11) Write short notes on ANY three. **[18]**

a) Client – Server Testing Techniques.

b) Functional Testing of Website.

c) Difference between web application testing and client/server testing.

d) Importance of code review in software security testing.

Total No. of Questions : 12] [Total No. of Pages :3

P1227

[3564] - 346
B.E. (Computer Engineering & I.T.)
EMBEDDED SYSTEMS
(2003 Course) (410451)

Time : 3 Hours] *[Max. Marks:100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***In section I attempt : Q.No. 1 or Q.No. 2, Q.No 3 or Q.No 4, Q.No. 5 or Q.No. 6. In section II attempt : Q.No. 7 or Q.No. 8, Q.No 9 or Q.No 10, Q.No. 11 or Q.No. 12.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) What are the different categories of Embedded Systems depending on the area of applications? **[8]**

b) Which are the different processors used as GPP in the Embedded Systems? Mention applications for each. **[8]**

OR

Q2) a) List different features of ARM7 family. Also mention the features which enhance the speed of operation of ARM7. **[8]**

b) What are the characteristics of Embedded Systems? **[8]**

Q3) a) With the help of neat diagram, explain the different stages of conversion of assembly language into ROM image. **[8]**

b) Describe special structural units of processor that helps to improve its performance when used in Embedded System. **[8]**

OR

Q4) a) What is the role of clock oscillator circuit in an Embedded System? **[6]**

P.T.O.

b) Mention the required processor and memory (size and type) for the following devices. Also justify the selection of processor and memory for the same. **[10]**

i) Mobile phone.
ii) Automatic Robotics system.

Q5) a) Describe the topology used in a USB protocol. How many maximum devices can be connected? **[6]**

b) Describe any one IPC mechanism in detail. **[6]**

c) What is the use of optical devices in Embedded Systems? **[6]**

OR

Q6) a) Differentiate between I^2C and CAN protocol. Mention the applications where these protocols are preferred. **[6]**

b) What is the necessity of different hardware devices in Embedded Systems? **[6]**

c) What are the different Embedded OS models? Give examples. **[6]**

SECTION - II

Q7) a) What are the advantages of using higher level language for the development of complex Embedded System? **[6]**

b) Name the appropriate data structures in C language to implement the following for an Embedded System. Also substantiate your answer. **[6]**

i) Printer Buffer.
ii) Series of active tasks to be maintained by scheduler.
iii) Maintaining a file directory.

c) Differentiate between complier and cross complier. **[4]**

OR

Q8) a) What are the advantages of assembly language programming when used for the development of an Embedded System? **[4]**

b) How Queuescan be used to implement a network protocol? Discuss with the help of a neat diagram. **[7]**

c) What are the disadvantages of using Java programming for the development of embedded applications? **[5]**

Q9) a) State and explain different criteria, based on which RTOS is selected for an embedded application. **[6]**

b) How time taken for an ISR execution in RTOS can be made shorter? Discuss the techniques for the same. **[6]**

c) What are fixed or static real time scheduling methods? How fixed schedules are defined? **[6]**

OR

Q10) a) With the help of neat diagram, name and explain the most preferred scheduling technique used in RTOS. Also state the worst case latency period for the same. **[10]**

b) Differentiate between Desktop OS and an Embedded OS. **[4]**

c) Name four Operating Systems used in mobile devices. **[4]**

Q11) a) Is MicroC/OS-II a hard RTOS or a soft RTOS? Is this OS scalable? Why is it popular? **[6]**

b) Assume an embedded system in which RTOS tasks communicate to the TCP/IP stack from an application. The application layer byte streams are formatted and sent on the TCP/IP network.
For the above said system, draw and discuss the scheduling sequence of the different tasks during TCP/IP transmission. Also discuss IPCs used. **[10]**

OR

Q12) a) Name the scheduling algorithms used in VxWorks. Also discuss area of applications of VxWorks. **[6]**

b) What are the different inter process communication (IPC) techniques implemented in VxWorks? Give details. **[6]**

c) What are the limitations of MicroC/OS- II? Also mention two area of applications. **[4]**

Total No. of Questions : 12] **[Total No. of Pages :3**

P1222

[3564] - 335
B.E. (IT)
OBJECT ORIENTED MODELING & DESIGN
(2003 Course)

Time : 3 Hours] ***[Max. Marks:100***

Instructions to the candidates:

1) ***Answer three questions from each section.***
2) ***Answers to the two sections should be written in separate books.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) a) What is OMG? What are its objectives? Explain the new features in UML 2.0. **[8]**

b) What are the salient features of RUP? How is it different from the waterfall model? **[8]**

OR

Q2) a) What is CORBA standard? How do remote invocations work in CORBA? **[8]**

b) Explain following OO concepts - coupling, aggregation, cohesion, persistence. **[8]**

Q3) a) Explain following UML standard stereotypes - <<create>>, <<import>>, <<powertype>> , <<utility>>. **[8]**

b) Explain following concepts with reference to a deployment diagram - node, artifact, <<deploys>>, communication. **[8]**

OR

Q4) a) How are derived attributes, pre / post conditions and class invariants expressed in OCL? Explain with an example. **[8]**

b) What are UML profiles? What is forward engineering of a class in C++ from a class diagram? **[8]**

P.T.O.

Q5) a) Explain different types of class relationships in a class diagram. You have to design a system for a doctor's clinic. Identify the system requirements and model them in a Use Case Diagram. **[9]**

b) Show with examples timing constraints in a sequence diagram. How is CRC method useful to identify potential classes in a class diagram? **[9]**

OR

Q6) a) Draw a design level class diagram for a - **Student Admission System**. State clearly the scope and assumptions made. **[9]**

b) With reference to composite structure diagram explain with example following elements - part, port, connector, collaboration, structured classifier. **[9]**

SECTION - II

Q7) a) Consider a Use Case in Library System namely "Return a book in a library" The member, book, issue and return records will have to be updated appropriately. Please identify correct objects and messages and draw a SEQUENCE diagram for this scenario or use case. **[8]**

b) Give notation for following concepts in a sequence diagram. Explain these with help of a hypothetical online computer store application. i) Alt ii) return values iii) full notation for a message iv) destroy an object. **[8]**

OR

Q8) a) Draw a communication diagram for 'Schedule a seminar' in a hypothetical college system for TE seminar management. Make suitable assumptions about the scope, possible classes in your system. **[8]**

b) Compare following : **[8]**

i) sequence and communication diagram.

ii) synchronous and asynchronous messages.

Q9) a) Explain following concepts from activity diagrams. **[8]**
i) action pins ii) parameter nodes iii) partitions iv) forks.

b) Identify all the academic activities that you do in a semester from its start till it ends. e.g. admissions, attending classes, labs, exams, gathering any many more. Draw an activity diagram showing these activities with swim lanes, forks and joins. **[8]**

OR

Q10) a) A FSM toaster has two slots. Each can hold a slice of bread to be toasted. If only one slice is to be toasted, it must be placed in slot 1. The user places the bread in the slots and then depresses the lever. The bread descends into the toaster. Heating filaments toast the bread. When the toast is complete, the carrier pops up, and the toast is made available to the user. How do we know when the toast is done? There is a color selector knob on the toaster. A sensor in slot 1 measures the color of the toast. When the toast has acquired the color that the knob is set to, the toast is complete. Alternatively, a timer will terminate the toasting if the toast takes "too long" to reach the appropriate color. Alternatively, if the color changes too fast, then the toasting is aborted. This protects us from starting fires when someone puts a piece of paper in the slot.

Toasting best occurs at a particular temperature. If too hot, the surface of the bread scorches but the inside remains too soft. If too cold, the toasting takes too long and the bread dries out too much. Thus, the temperature has to be carefully regulated. Moreover, as the color of the bread changes, the optimum toasting temperature rises due to decreased reflectivity of the bread. Thus, the temperature is a function of color.

Draw a state transition diagram for this FSM toaster. **[8]**

b) Explain with notations following concepts. **[8]**

Self transition, entry / exit actions , transition to a composite state, history state.

Q11) a) A bank wants to build a loan management system. Identify various subsystems and depict the entire architecture of the system in a package diagram. **[9]**

b) An academic institution has developed a campus wide network and has implemented an ERP software. The students section, library, accounts section, stores , principal's office are all connected. All the modules are centrally served thru a server in form of a web application. The database server is located in the systems department and the application server is located at the computer center. Identify the different software components required, make assumptions about their environment and depict all this in a deployment diagram. **[9]**

OR

Q12) a) What stereotypes are used in a component diagram.? Explain following concepts relevant to a component diagram - interfaces, ports, component dependencies. **[9]**

b) Write a note on modeling architecture in UML. **[9]**

Total No. of Questions : 10] **[Total No. of Pages :2**

P1196

[3564] - 91
B.E. (I.T)
MANAGERIAL ECONOMICS
(410445) (1997 Course) (Elective - I)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates:-

1) ***Solve any two questions from each section.***
2) ***Q5 & Q10 are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Answer to the two sections must be written in two separate answer books.***

SECTION - I

Q1) Define law of demand. Explain any 2 techniques of demand forecasting. **[16]**

Q2) Distinguish between micro & macro economics. How does decision making play a vital role in economics? **[16]**

Q3) What do you understand by the term business organisation? Elaborate the advantages & disadvantages of cooperative societies. **[16]**

Q4) Define supply. Explain elasticity of supply, with diagrammatic representation. **[16]**

Q5) Write short notes on (any three) : **[18]**

a) Value of the firm.
b) Elasticity of demand.
c) Short term costs.
d) Proprietary firm.
e) Importance of managerial economics.

P.T.O.

SECTION - II

Q6) Explain the concept of market. Elaborate the features of perfect competition. **[16]**

Q7) What is cost benefit analysis? Explain the steps involved in cost benefit analysis. **[16]**

Q8) Explain the meaning of price in economics. Explain the advantages & disadvantages of support prices & administered prices. **[16]**

Q9) How is price determined under perfect competition? Explain with diagrammatic representation. **[16]**

Q10) Write short notes on (any three) : **[18]**

a) Liberalisation.

b) Private Vs Public Goods.

c) Oligopoly.

d) Policy Planning.

e) Sales Maximisation.

■■■■

Total No. of Questions : 12] **[Total No. of Pages : 2**

P1317 **[3564] - 355**

B.E. (I.T)

SYSTEM OPERATIONS AND MAINTENANCE

(414448) (2003 Course)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions to the candidates:

1) ***Attempt not more than 6 questions of which at least 3 questions must be from each Section.***
2) ***Answers to the two sections should be written in separate answer books.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Figures to the right indicate full marks.***
5) ***Your answers will be valued as a whole.***
6) ***Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
7) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Explain service delivery cycle. **[9]**

b) With a neat diagram explain organizational structure of an average telecommunication provider. **[9]**

OR

Q2) a) Explain siqnalling system 7. **[9]**

b) Explain the working of RSVP. **[9]**

Q3) a) Explain web switch. **[8]**

b) Explain with a neat example MPLS. **[8]**

OR

Q4) a) With a case study describe policy based networking. **[8]**

b) With a case study explain directory enabled networking. **[8]**

Q5) a) With a neat diagram explain service architecture for IP environments. **[8]**

b) Write notes on - **[8]**

- Innovative services.
- Electronic market places.

P.T.O.

OR

Q6) a) With a neat diagram explain functions within the TMN architecture. **[8]**

b) Write notes on - **[8]**

- CORBA.
- TINA.

SECTION - II

Q7) a) Explain Traditional SNMP manager. **[9]**

b) Discuss the architecture of common Information model. **[9]**

OR

Q8) a) Explain Traditional SNMP agent. **[9]**

b) Explain LDAP, attributes of LDAP & its limitations. **[9]**

Q9) a) Explain differentiation of market segments. With respect to customer care process. **[8]**

b) Distinguish between sales and marketing process. **[8]**

OR

Q10)a) With a case study explain problem handling process. **[8]**

b) Write a note on SLA. **[8]**

Q11)a) Explain the significance of CDRs. **[5]**

b) With a neat example explain service creation, planning and development process. **[5]**

c) Draw a diagram of functions of the network inventory management process. **[6]**

OR

Q12)a) Compare - reverse and reengineering. **[5]**

b) Write the job profile of a typical network operations manager. **[5]**

c) What is - **[6]**

i) Change management.

ii) Mediation system.

Total No. of Questions : 12] **[Total No. of Pages : 3**

P1279

[3564]-349
B.E. (IT)
ADVANCED DATABASE MANAGEMENT
(414442) (2003 Course)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions :

1) ***Answers to the two sections should be written in separate books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume suitable data, if necessary.***
4) ***Section-I : Q1 or Q2, Q3 or Q4, Q5 or Q6.***
5) ***Section-II : Q7 or Q8, Q9 or Q10, Q11 or Q12.***

SECTION - I

Q1) a) Explain Parallel Database architectural models. **[12]**

b) Describe scaleup and speedup in Parallel databases. **[5]**

OR

Q2) a) Explain Intraoperations in Parallel Databases. **[12]**

b) Write a short note on Parallel Query Optimization. **[5]**

Q3) a) Explain Synchronous and Asynchronous Replication in Distributed Databases. **[5]**

b) State different types of failures in distributed systems and explain failure handling in distributed database using 2 Phase Commit protocol and 3 Phase Commit protocol. **[12]**

OR

Q4) a) Explain LDAP Data Model. **[5]**

b) Write a short note on Bully Algorithm. **[6]**

c) Explain any three algorithms to handle distributed deadlock in distributed databases. **[6]**

Q5) a) Describe different techniques of storage of XML Data. **[8]**

b) Describe XML query algebra operation. Describe the use of XQuery for Path Expression and FLWR expression in web DBMS. **[8]**

P.T.O.

OR

Q6) a) Explain three tier Web architecture in detail. State advantages of three tier architecture. **[8]**

b) Write short notes on – **[8]**

i) XML DTD and schemas.

ii) Web services.

SECTION - II

Q7) a) Discuss the activities associated with a data warehouse for Financial Services with the help of following points. **[12]**

i) Business processes.

ii) Business Questions expected in data warehouse environment.

iii) Design conceptual schemas.

iv) Failures and Backup strategies.

b) Compare OLTP vs OLAP. **[5]**

OR

Q8) a) Discuss what is meant by the following terms when describing the characteristics of the data in a data warehouse. **[5]**

i) Subject Oriented.

ii) Integrated.

iii) Time variant.

iv) Non volatile.

b) Explain guidelines for designing fact table and dimension table. **[6]**

c) Write a short notes on Warehouse Manager. **[6]**

Q9) a) Construct a decision-tree classifier with binary splits at each node, using tuples in relation r(A, B, C) shown below as training data; attribute C denotes the class. Show the final tree and with each node show the best split for each attribute along with its information gain value (1,2,a) (2,1,a) (2,5,b) (3,3,b) (3,6,b) (4,5,b) (5,5,c) (6,3,b) (6,7,b). **[12]**

b) Write a short note on Bayesian Classifier. **[5]**

OR

Q10) a) Write any algorithm for finding association rule with suitable example. **[12]**

b) Describe different clustering techniques in short. **[5]**

Q11) a) Explain any two techniques that support the evaluation of Boolean and Ranked queries. **[8]**

b) Explain different factors for relevance ranking in information retrieval System. **[8]**

OR

Q12) a) Explain Web search engine using link information. **[8]**

b) Define Information Retrieval System. Describe how it is differ from database system. **[8]**

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Total No. of Questions : 10] **[Total No. of Pages : 2**

P1272

[3564]-89
B.E. (IT)
OBJECT ORIENTED COMPONENT SYSTEMS (410452)
(1997 Course) (Elective - II) (Old)

Time : 3 Hours] ***[Max. Marks : 100***

Instructions :

1) ***Answer any three questions from each section.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written in separate answer books.***
4) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) What do you understand by the following terms. **[16]**

a) Objects and classes.

b) Distributed systems.

c) Class factories.

d) Interfaces.

Q2) Explain with examples the given concepts. **[16]**

a) RPC Stubs.

b) Active X controls .

c) Software Components.

d) Slim clients (Thin).

Q3) Explain concept in brief. **[16]**

a) ORB.

b) 2 tier Client Server systems.

c) DCOM as middleware.

d) Relational tables.

Q4) Explain the following with neat diagrams. **[16]**

a) CORBA architecture with stubs/skeletons.

b) Transaction processing Monitors.

P.T.O.

Q5) Write short notes on any three. **[18]**

a) Glue (middleware).

b) Presentation, Logic, Data.

c) Fat clients.

d) ACID properties of transactions.

SECTION - II

Q6) What is E-Commerce? Give examples of E-Commerce. What considerations related to user friendliness, security, on-line payment methods, session management, performance must you consider when developing on-line shopping websites? **[16]**

Q7) a) Write short notes on Browsers as web clients. **[6]**

b) Write short notes on J2EE. **[6]**

c) What is the object oriented principal of inheritance. **[4]**

Q8) Explain the following concepts in brief. **[16]**

a) Reliability of a server.

b) Dynamic content on websites.

c) Legacy systems.

d) TCP-IP.

Q9) Explain the following terms/concepts with examples of your own. **[16]**

a) Authentication.

b) Entity beans.

c) HTML on client side.

d) XML tags.

Q10) Write short notes on any three. **[18]**

a) Object oriented systems.

b) Advantages of components in distributed systems.

c) Java as object oriented language.

d) Internet.

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