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

P1257

[3364]-633
B.E. (Computer)
DESIGN AND ANALYSIS OF ALGORITHMS
(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 answer books.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Justify the following statement :
"The space complexity under logarithmic cost is O(n log n)". **[4]**

b) Consider the function f(n) defined as

$f(n) = n^n$ for all integers $n >= 1$

0 otherwise

the fragment of pseudo code to compute n^n is given below

```
compute ()
{   read n;
    if (n<=0) return (0);
    else {t=n;
          p=n-1;
          while (p > 0)
          {t=t*n;
          p=p-1;}
    return (t);
    }
}
```

Determine the time and space complexity of this code fragment. Clearly mention any assumptions made. **[6]**

c) Prove by contradiction that "there are infinitely many prime numbers" **[8]**

OR

Q2) a) Name and explain in two or three sentences three popular methods to arrive at amortized costs for the operations. **[6]**

P.T.O.

b) If $f(n) = a_m n^m + \ldots\ldots\ldots\ldots + a_1 n + a_0$ then prove that $f(n) = O(n^m)$. **[8]**

c) State whether the following equalities are correct or incorrect. **[4]**

i) $5n^2 - 6n = \Theta(n^2)$

ii) $n! = O(n^m)$

iii) $n^3 + 10^6 n^2 = \Theta(n^2)$

iv) $6n^3/(\log n+1) = O(n^3)$.

Q3) a) Consider the recurrence relation for divide and conquer

$$T(n) = \begin{cases} T(1) \ldots\ldots & n = 1 \\ aT(n/b) + f(n) \ldots\ldots & n > 1 \end{cases}$$

where a, b are constants and n is power of b. Assume a=2, b=2, t(1) = 2 and f(n) = n. Solve the above recurrence relation. **[8]**

b) Write an algorithm for recursive binary search. What is the time complexity for successful search and unsuccessful search? **[8]**

OR

Q4) a) Write an algorithm for merge sort. Determine the time complexity of this algorithm. **[8]**

b) With respect to greedy method define the following terms and briefly explain their significance. **[8]**

i) Feasible solution.

ii) Optimal solution.

iii) Subset paradigm.

Q5) a) Consider the directed graph as shown in the figure Q5(i) and edge length matrix in figure Q5(ii). Find the optimal tour of this graph using Dynamic programming strategy. **[10]**

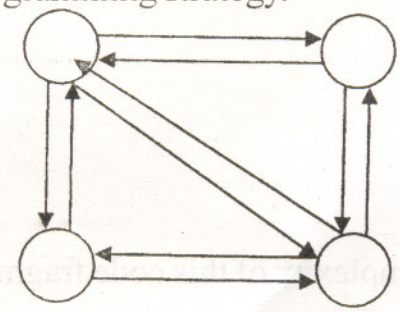

fig Q5(i)

0	10	15	20
5	0	9	10
6	13	0	12
8	8	9	0

fig Q5(ii)

b) Explain how 0/1 Knapsack problem can be solved using dynamic programming strategy. [6]

OR

Q6) a) Write a function to compute length of shortest paths of a given graph. [6]

b) Write a short note on optimal binary search tree. [6]

c) Name the elements of dynamic programming? How does the dynamic programming solves the problem? [4]

SECTION - II

Q7) a) With respect to backtracking what do you mean by explicit constraint and implicit constraints? [4]

b) Write recursive backtracking schema for m coloring of the graph. Determine the time complexity of the same. [12]

c) Enlist the characteristics of backtracking strategy. [2]

OR

Q8) a) Write an algorithm for finding Hamiltonian cycles using Backtracking strategy. What is the cost of the tour? [6]

b) Write an upper bound function for 0/1 knapsack problem. [6]

c) Explain how Branch and Bound method can be used to solve traveling salesperson problem. [6]

Q9) a) If a comparison network with n inputs sorts all 2^n possible sequences of 0's and 1's correctly then prove that it sorts all sequences of arbitrary numbers correctly. [6]

b) When do you claim that "a parallel algorithm is work optimal"? [2]

c) Write an odd-even merge parallel algorithm. [8]

OR

*Q10)*a) State True or False and justify: Efficiency of work optimal parallel algorithm is $\Theta(1)$. [2]

b) What is prefix computation problem? Explain in brief. [6]

c) Write an algorithm for prefix computation. Determine its time complexity. [8]

*Q11)*a) The Hamiltonian circuit problem for directed graphs polynomially transformable to the Hamiltonian circuit problem for the undirected graph. Prove that the problem of determining whether there is a Hamiltonian circuit in an undirected graph is NP complete. **[8]**

b) What is satisfiability problem? Explain in brief. **[6]**

c) When do you claim that an algorithm is of a polynomial complexity? **[2]**

OR

*Q12)*a) Explain AND/OR graph decision problem. **[6]**

b) Prove that a directed Hamiltonian cycle α the traveling salesman decision problem. **[6]**

c) What is the basic difference between deterministic and non deterministic algorithms? Give suitable example. **[4]**

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

P1261

[3364]-636

B.E. (Computer Engineering)

PRINCIPLES OF COMPILER DESIGN

(2003 Course)

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) ***Assume suitable data, if necessary.***
5) ***Your answers will be valued as a whole.***

SECTION - I

Q1) a) Write a lex program to count number of characters, words and lines in a given input text file. Create an output text file that consists of the contents of the input file as well as line numbers. **[10]**

b) A C compiler uses the preprocessor. With suitable examples. Explain all the features of the C Preprocessor you know. **[7]**

OR

Q2) a) With a neat diagram, explain various phases of a compiler. **[9]**

b) Explain the following : **[8]**

i) Cross Compiler
ii) Bootstrap Compiler
iii) Incremental Compiler
iv) Compiler-Compiler

Q3) a) Discuss the problems associated with top-down parsing. How these problems can be overcome? **[8]**

b) Write a context free grammar for identifying an assignment, and if then and if then-else statement and construct a LL (1) parser table. Show the moves of the LL (1) parser for the following input stream of tokens.

"ibtibtaeaea"

Where 'i', 'b', 't', 'a' and 'e' represents the tokens if, condition then assignment statement and else respectively. **[9]**

OR

P.T.O.

Q4) a) Write a CFG to identify arithmetic expressions and construct a LALR parser table for your grammar. Assume normal precedence and associativity for the operators. **[10]**

b) Explain in brief the function of an operator precedence parser. **[7]**

Q5) a) Explain the following terms with suitable examples: **[9]**

i) Inherited Attributes

ii) Synthesized Attributes

iii) Marker Non Terminal Symbols

b) C programs may consist of enumerated ('enum') type of variables. Write a CFG for declarative statement that includes enum apart from the types such as 'int' and 'char'. What information is required to be stored about the 'enum' types of variables in the symbol table. Illustrate your answer with suitable example. **[7]**

OR

Q6) a) Explain the technique of "Back Patching" for translation of flow-of-control statements: if-then, if-then-else and while do. **[10]**

b) Explain the structure and management of the symbol table for the translation of declarative statements in a block structured language. **[6]**

SECTION - II

Q7) a) Compare the three memory management techniques: Static, Stack and Heap. **[6]**

b) C or PASCAL compilers use all the three memory management techniques you discussed in Q 7(a) above. With a suitable example C or PASCAL program, explain how these compilers use these techniques. **[10]**

OR

Q8) a) Discuss the significance of static and dynamic links for run-time storage management and access to non-local names. **[10]**

b) With suitable examples, explain the various parameter-passing methods. **[6]**

Q9) a) What is peephole optimization? Explain with suitable examples. **[7]**

b) List various code generation algorithms you know and discuss any one of them. **[10]**

OR

Q10) a) What is a DAG? With suitable illustrations explain the role of DAG in code generation phase. **[10]**

b) Discuss various issues in code generation phase. **[7]**

Q11) a) Discuss the principal sources of code optimization. **[7]**

b) With suitable illustrations, discuss the code optimization of basic blocks. **[10]**

OR

Q12) a) What do you mean by a common sub expression? Discuss the algorithm for elimination of common sub expression. **[10]**

b) Discuss the algorithm for live variable analysis. **[7]**

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

P1143

[3364]-638

B.E. (Computer) May-June 2008

ADVANCED DATABASES (410445)

(2003 Course)

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) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Describe the three main architectures for parallel DBMS. [8]

b) Describe and differentiate pipelined parallelism and data partitioned parallelism. [4]

c) Explain : Point queries in parallel DBMS. [4]

OR

Q2) a) Explain following points with respect to parallel DBMS interoperation parallelism, left-deep trees and bushy trees, Inter-query parallelism. [10]

b) Explain how "join" operation can be parallelized? [4]

c) What is skew in parallel databases? [2]

Q3) a) Explain : Distributed query processing. [6]

b) What is distributed data independence? [4]

c) Explain in brief : "Storing data in a distributed DBMS". [4]

d) What is distributed deadlock? [2]

OR

Q4) a) Explain recovery techniques in distributed DBMS. [8]

b) Explain : Synchronous replication, Asynchronous replication. [4]

c) Write short note : Directory Systems. [4]

P.T.O.

Q5) a) Write short note : SOAP. [4]

b) Explain following with respect to querying XML data, path expressions, FLWR expressions. [6]

c) Explain following terms with respect to web architecture. HTTP, Uniform Resource Indentifier (URI). [4]

d) Explain client-server architecture in detail. [4]

OR

Q6) a) What are advantages of N-tier architecture? [6]

b) Write in detail : XML documents. [6]

c) Explain following with respect to web architecture. HTTP request and response, Data management tier, HTML documents. [6]

SECTION - II

Q7) a) Explain in brief following preprocessing techniques. Data cleaning, Data reduction. [6]

b) Write short note : OLAP. [4]

c) Explain the star schema for dimensional modelling. (Support your answer with proper example) [4]

d) Explain : Pivoting, ROLAP. [4]

OR

Q8) a) Explain the architecture of Data warehouse. [6]

b) Explain following operations with respect to data cube (support your answer with suitable example) Roll-up, Drill-down. [6]

c) What are dimensions and facts in dimensional modelling? [3]

d) What is data integration and transformation? [3]

Q9) a) Write short note : Baysian classifiers. [4]

b) What is machine learning? [2]

c) State and explain "Apriori Algorithm" for association rules. [6]

d) Explain applications of data mining. [4]

OR

*Q10)*a) Which are different techniques for classification? Explain any one in detail. [6]

b) What is outlier analysis? [2]

c) Why data mining is important? [2]

d) State and explain K-means algorithm for clustering. [6]

*Q11)*a) What is difference between DBMS and Information Retrieval system? **[4]**

b) Write short note : Web Search Engine. **[4]**

c) Explain : Vector space model. **[4]**

d) Explain : Signature files. **[4]**

OR

*Q12)*a) Which are different indexing techniques for text search? **[6]**

b) Explain following terms – **[6]**
synonyms, homonyms, hyperlinks.

c) Explain in brief popularity ranking and page ranking. **[4]**

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

P1088

[3364]-641

B.E. (Computer) May - June 2008

NETWORKS AND INFORMATION SECURITY

(410448) (2003 Course)

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

Instructions to the candidates :

1) *Attempt three questions from Section - I and three questions from Section - II.*
2) *Figures to the right indicate full marks.*
3) *Draw neat diagrams wherever necessary.*
4) *Make suitable assumptions wherever necessary.*

SECTION - I

Q1) a) What do you mean by the spoofing? Explain how IP spoofing is carried out. **[8]**

b) List and explain the vulnerabilities in OSI model. **[8]**

OR

Q2) a) Explain how Trojan Horse collects the information from the network. **[8]**

b) Describe Denial of Service attack with two suitable examples. **[8]**

Q3) a) How efficiency of RSA algorithm lies in the power of exponentiation? How many multiplies and divisions would require for 123^{54} mod 678? Justify your answer by giving manual calculations. **[8]**

b) Explain the principle of elliptical curve cryptography. How data is encrypted and decrypted using elliptic curves? **[8]**

OR

Q4) a) Explain how message authentication code (MAC) ensures the integrity of message. Why private and public keys cannot be used in creating a MAC? **[8]**

b) List the requirements for good Hash function and explain how it ensures the integrity of data. **[8]**

Q5) a) What is triple DES? What is triple DES with two keys? What is triple DES with three keys? **[10]**

P.T.O.

b) What is double DES? What kind of attack on double DES makes it useless? [8]

OR

Q6) a) AES defines different implementations with three different numbers of rounds 10, 12 and 14. What are the advantages and disadvantages of AES over DES with respect to this difference? [10]

b) How is key distribution implemented in public key cryptography and private key cryptography? [8]

SECTION - II

Q7) a) List ISAKMP payload types and explain the purpose of each. [8]

b) Explain Oakley aggressive key exchange protocol by giving proper steps. [8]

OR

Q8) a) Compare between PPTP and L2TP. [8]

b) Give the header format of AH for IPv6 and explain all field of it. [8]

Q9) a) Discuss different firewall configurations with neat diagrams. [8]

b) How security is implemented in wireless LAN? [8]

OR

Q10) a) How security can be implemented in routers? [8]

b) How security can be implemented in virtual LAN? [8]

Q11) a) Explain architecture of SSL. [10]

b) What is the major difference between Kerberos version 4 and version 5? Justify your answer. [8]

OR

Q12) Write short notes on: (Any Three) [18]

a) SET

b) PGP

c) E-cache

d) Security in Smart Card.

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

P1089

[3364]-642

B.E. (Computer) May-June 2008

ADVANCED COMPUTER ARCHITECTURE AND COMPUTING

(2003 Course)

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

Instructions to the candidates :

1) ***Attempt Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6 from section I and Q. No. 7 or Q. No. 8, Q. No. 9 or Q. No. 10, Q. No. 11 or Q. No. 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) Compare Flynn's classification and Feng's classification for parallel Computer Architectures. **[8]**

b) With suitable example / flow chart explain:

i) Branch Predication and

ii) Speculative loading

With respect to Itanium processor. **[8]**

OR

Q2) a) What are the levels of parallel processing? Explain in brief. **[6]**

b) Briefly explain parallel processing application in weather forecasting. **[4]**

c) Define various scalability metrics and give it's significance towards the performance of computer system. **[6]**

Q3) a) Given a reservation table of a unifunctional pipeline. Discuss in detail implementation of scheduling strategy for successive tasks to obtain minimum average latency (MAL). **[10]**

b) Explain various types of data Hazards observed in pipeline processor. How these Hazards could be detected and resolved? **[8]**

OR

P.T.O.

Q4) a) Compare between: [6]

i) Static & Dynamic pipeline

ii) Unifunctional & Multifunctional pipeline.

b) With example, explain loop unrolling technique. What are it's advantages and disadvantages? [6]

c) Explain in detail branch prediction logic implemented in pentium architecture. [6]

Q5) a) Discuss a problem of 4 × 4 matrix multiplication on 4-cube network. Obtain it's time complexity. [8]

b) Explain in brief the programming model of CRAY-1 vector processor. [8]

OR

Q6) a) State Routing functions of Illiac IV mesh network. How it can be viewed as single stage recirculating network for N = 16. Define the permutation cycles for the same. [8]

b) What are advantages of vector processing over scalar processing? What is vectorizing compiler? State any two vector optimizing functions. [8]

SECTION - II

Q7) a) Discuss Dynamic bus arbitration techniques associated with time shared bus. [10]

b) Compare between: [8]

i) Write - Through and Write - Back caches.

ii) Write - Update and Write - Invalidate protocol.

OR

Q8) a) Compare between: [10]

i) Cow's and Now's.

ii) Chip multiprocessing and Multithreading.

iii) Shared memory system and Distributed memory systems.

b) Explain features of IBM Power - 4 processor. [8]

Q9) a) Discuss in brief Latency hiding Techniques with respect to Multithreaded Architecture. **[8]**

b) What is memory consistency model? With example explain processor consistency model. **[8]**

OR

Q10) a) Using FORK and JOIN primitives explain shared memory parallel programming, give one example. **[8]**

b) Explain the features of Data parallel programming with standard constructs implemented in any one such language. **[8]**

Q11) a) Explain with examples, following collective communication functions implemented in MPI library: **[8]**

i) MPI - Gather ( )

ii) MPI - B cost ( )

iii) MPI - Scatter ( )

b) Discuss the features of parallel algorithms, written for multiprocessor systems. How these algorithms are classified? **[8]**

OR

Q12) a) Explain the features of control and data parallelism implemented in CCC. **[8]**

b) Explain how Neural Network can be used for distributed computing. **[8]**

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

P1275 [3364]-643

B.E. (Computer) May-June 2008

SOFTWARE TESTING & QUALITY ASSURANCE

(Theory) (410450) (2003 Course)

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) *Your answers will be valued as a whole.*

SECTION - I

Q1) a) Explain Scales or Levels of measurements. [8]

b) What is 'Prediction system'? Comment on validating prediction system? How to choose an appropriate prediction system in case of software measurement validation? [8]

OR

Q2) a) Explain any eight activities related to software metrics which involves some degree of software measurement? [8]

b) Explain what is meant by direct & indirect measurement? [4]

c) Define : i) Measurement ii) Entity iii) Attribute. [4]

Q3) a) Explain Halstead's major Equations for following:

i) Total Vocabulary. ii) Length

iii) Volume iv) Level

v) Difficulty vi) Efforts

vii) Faults

Calculate estimated program length & efforts required by taking suitable example? [12]

b) Comment on Big-O notation & its role in complexity measurement? [4]

OR

Q4) a) Explain different types of structural measures. [8]

b) Explain Albercht's approach for functionality measure. [8]

Q5) a) What is Metric Plan? [2]

b) Explain different Measurement tools? [8]

c) Explain different States of defects? [8]

OR

Q6) Write short Notes on (any 3): [18]

a) Requirement based Testing.

b) State based testing.

c) Mutation Testing.

d) Code Walkthrough.

SECTION - II

Q7) a) Explain in detail what is acceptance Testing, Necessity of acceptance Testing? Give suitable example if required. [8]

b) Explain with example & diagram two types of testing (1. Manual testing 2. Automated Testing). [8]

c) What is Test plan. [2]

OR

Q8) Write short notes on (Any 3): [18]

a) Test Execution & Reporting.

b) GUI Testing.

c) Web app. Interface Testing.

d) Validation Testing.

Q9) a) What are Software Reviews? Explain in detail different types of Formal reviews & Informal reviews? [8]

b) What is Six Sigma Principle? How to apply Six Sigma to improve Customer satisfaction? [8]

OR

*Q10)*a) Comment on software inspection? [8]

b) Explain in detail ISO9000. [8]

Q11)a) Explain skill sets needed for two important roles. 'product-in-charge' & 'support Analyst'. **[8]**

b) Explain the role of Customer repository, Defect Repository, Customer Support Repository in problem reporting. **[8]**

OR

Q12)a) Explain the two major factors which help in prioritizing problem for working on fix. **[8]**

b) What are challenges, Best Practices & Pitfalls in problem resolution. **[8]**

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P1090

[3364]-644

B.E. (Computer) May-June 2008

DISTRIBUTED SYSTEMS

(410451) (2003 Course)

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) Explain the difference between vertical distribution and horizontal distribution. **[6]**

b) Explain different techniques to achieve scalability in distributed systems. **[6]**

c) Compare network operating system and middleware based distributed system. **[6]**

OR

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

b) Explain an open distributed system and what benefits does openness provide. **[6]**

c) Explain in brief fundamental models in distributed systems. **[6]**

Q3) a) Explain why transient synchronous communication has inherent scalability problems, and how these could be solved. **[8]**

b) Explain parameter passing issues in remote procedure call. **[8]**

OR

Q4) a) What is the role of distributed objects? Which objects are most suitable in distributed system? **[8]**

b) Describe with the help of neat diagrams two types of persistent communication and four types of transient communication. **[8]**

Q5) a) Explain with neat diagram how local and remote file systems are accessible on an NFS client. **[8]**

b) Explain automounting in NFS. **[4]**

c) The distributed file system Coda allows a client to continue working with a shared file even if there is no network connection between client and sever. Explain how this is made possible. **[4]**

OR

Q6) a) Compare the following distributed file systems: Plan 9, xFS, SFS. **[8]**

b) Explain different methods for name resolution with suitable example. **[8]**

SECTION - II

Q7) a) Explain the importance of clock synchronization in distributed system. **[4]**

b) Explain Lamport's algorithm with suitable example. **[8]**

c) What is global state of a distributed system? Explain the difference between consistent cut and inconsistent cut. **[6]**

OR

Q8) a) Compare bully and ring election algorithms. **[10]**

b) Explain Ricart and Agrawala's mutual exclusion algorithm. **[8]**

Q9) a) Explain RPC semantics in the presence of failures. **[8]**

b) Explain principle of virtual synchronous multicast with suitable diagram. **[8]**

OR

Q10) a) Explain what is message ordering and give an example in which group communication requires no message ordering at all. **[8]**

b) What is Byzantine failure? Can the model of triple modular redundancy handle Byzantine failures? Explain. **[8]**

Q11) a) What is CORBA? Describe the general organization of CORBA system with the help of neat diagram. **[8]**

b) Discuss in detail the architecture of Grid Computing Systems. **[8]**

OR

Q12) a) Describe the design issues and architecture of Cluster computing systems. **[8]**

b) Explain in brief different forms of communication supported by CORBA's invocation model. **[8]**

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

P1107

[3364]-645

B.E. (Computer / IT) (Common) May-June 2008

SOFTWARE ARCHITECTURE

(410451) (2003 Course) (Elective - II)

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

Instructions to candidates :

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Figures to the right indicate full marks.***
3) ***From Section I, Answer (Q1 or Q2) and (Q3 or Q4) and (Q5 or Q6).***
4) ***From Section II, Answer (Q7 or Q8) and (Q9 or Q10) and (Q11 or Q12).***
5) ***Make suitable assumptions wherever appropriate and relevant.***

SECTION - I

Q1) a) Draw a neat diagram to show the influence of stakeholders on the architect. Comment on why an Architect needs to make an early engagement of stakeholders. **[6]**

b) Software architecture manifests the earliest set of design decisions and it also especially makes it easier to reason about and manage CHANGE, explain. **[6]**

c) What do you understand by ALLOCATION structure. Give one example of (any) a deployment diagram that addresses/depicts performance issues. **[6]**

OR

Q2) a) When and why will a software architect choose following choices for any system, justify with examples. **[6]**

i) ODBC ii) Client server systems.

iii) Web based clients.

b) Software architecture comprises elements, externally visible properties of the elements and relationship among elements. Explain the definition in brief. With examples from any hypothetical online shopping web site explain what you understand by externally visible properties. **[6]**

c) Write short notes on Layered Architecture (Hint OSI layers). **[6]**

P.T.O

Q3) a) Draw a neat diagram to depict 'Availability' general scenarios. How does one measure availability (formula). In brief write about the availability tactic 'Transactions' as a fault prevention tactic. **[8]**

b) In brief write about tactics (i) Maintaining existing interfaces (ii) Introducing concurrency. **[8]**

OR

Q4) Explain and illustrate the following concepts (in context of quality attribute) with examples, in brief. **[16]**

a) Maintaining data confidentiality.

b) Quality attribute scenario.

c) Performance bottlenecks.

d) Non functional requirements.

Q5) a) For the design pattern OBSERVER give the following: **[8]**

i) Motivation / problem.

ii) Solution that is the actual pattern.

iii) Example.

iv) Structure of classes involved.

b) Do you agree or disagree with the statement. Design patterns cannot be invented' and also Justify your answer. **[4]**

c) In brief state what are (i) Frameworks, (ii) MVC patterns. **[4]**

OR

Q6) a) What can a Mediator pattern do for us, illustrate with an example. **[4]**

b) Which design pattern will you choose to "Ensure a single instance of a class in memory for the application", How can one achieve/implement this in C++. **[6]**

c) Write short notes on Design pattern 'PROXY'. **[6]**

SECTION - II

Q7) a) What is the role of following J2EE technologies: Servelets, JSP, compare the two for web development. **[6]**

b) What is the advantage of having your application be developed from components like say EJB's. What are the services that a EJB container offer to beans. **[6]**

c) Compare developing applications directly at sockets level vs. Say by using a technology like JAVA RMI. **[6]**

OR

Q8) a) What do you understand by session maintenance, how do cookies help and how do session beans help respectively to maintain client session state. **[6]**

b) Draw a neat diagram for J2EE that shows various J2EE technologies. What is the need for JMS technology. **[6]**

c) Explain JDBC driver concept, specifically what is a type one driver. **[6]**

Q9) a) What kind of responsibilities does a web client have, how can one make the web client side more dynamic. **[4]**

b) Explain following web server side concepts through simple examples.

i) CGI ii) Application server

iii) Legacy applications iv) Web server. **[12]**

OR

*Q10)*a) Compare HTML and XML for use in web development. **[6]**

b) Discuss the concept of 3 tier Web applications. **[6]**

c) Discuss the security, dynamic aspects of java applets on client side. **[4]**

*Q11)*a) Compare the Microsoft world (COM,.NET, ASP and others) and Java world (Java, J2EE, JSP and others) for technologies they offer for web development and programming in general. **[8]**

b) Give examples and explain the following concepts in context of need, reusability, standards used for interoperability etc. **[8]**

i) Web services ii) Components.

OR

*Q12)*a) Explain in brief the following COM concepts. **[10]**

i) Class factory ii) Query Interface ()

iii) DLL servers iv) GUID

b) Write briefly about : common language runtime and C#, two of the features of . NET platform. **[6]**

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

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B.E. (Computer) MAY-JUNE 2008

HIGH PERFORMANCE NETWORKS

(2003 Course)

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

Instructions to the candidates :

1) ***Solve Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6 from section I and solve Q. No. 7 or Q. No. 8, Q. No. 9 or Q. No. 10, Q. No. 11 or Q. No. 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 need of carrier extension and frame bursting in Half Duplex operation of Gigabit Ethernet. **[8]**

b) Differentiate between Gigabit Ethernet and ATM as LAN Technology choices (at least 6 points). **[8]**

OR

Q2) a) Does Gigabit Ethernet supports Flow Control? If yes explain. **[8]**

b) Discuss the various Gigabit Ethernet Cabling options available with their suitable applications. **[8]**

Q3) a) What is congestion? Discuss in short how Frame Relay supports explicit congestion control? **[6]**

b) Draw the diagram of Functional groupings and reference points. Explain the functions of NT1, NT2 and TA. **[6]**

c) Differentiate between Frame Relay and ATM. **[6]**

OR

Q4) a) Comment on the significance of SAPI and TEI used by LAPD protocol. **[6]**

P.T.O.

b) Draw and discuss the LAPF Protocol Frame Format. [6]

c) What is call control? What are the functions supported by Q. 931 Protocol? [6]

Q5) a) Compute the optimum window size when a packet size is 53 bytes, the RTT is 60 ms and bottleneck bandwidth is

i) 1.5 Mbps (T1 trunk speed)

ii) 155 Mbps (OC-3 trunk speed) [8]

b) Comment on the various ATM service categories. The classification is based on which attributes. [8]

OR

Q6) a) What is AAL? Explain AAL 1 with suitable application support. [8]

b) Comment on B-ISDN Transmission structure. What are the 2 methods of transferring ATM cells? [8]

SECTION - II

Q7) a) How does ADSL differ from ISDN in functionality? [4]

b) What is DMT? [4]

c) Discuss a typical ADSL network architecture. [8]

OR

Q8) a) What are the data rates supported by ADSL, ADSL 2, VDSL and SHDSL? [8]

b) How does ADSL compare to cable modems? [4]

c) What is a POTS Splitter? [4]

Q9) a) Explain the need and working of RSVP protocol. [8]

b) Why Class based QOS is better than Flow Based QOS? Explain the concept behind differentiated services. [8]

OR

Q10) a) What is MPLS? Draw and explain the structure of label. [8]

b) Explain the working of MPLS with suitable diagram. [8]

Q11) a) What are the methods use to secure wireless network? **[4]**

b) Discuss in short the Two way handshake procedure used in 802.11. **[6]**

c) Differentiate between 802.11a and 802.11g standards. **[8]**

OR

Q12) a) Differentiate between 802.16 and 802.16a standards. **[6]**

b) Discuss the various WiMax Mobility issues. **[6]**

c) Explain the following terms related to WiMax Technology: **[6]**

i) Fixed Wireless Access (FWA)

ii) Mobile Wireless Access (MWA)

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