ME (CMPN) - Sem-I (Choice Based) 07/12/2016

Algorithms & Complexity

T6421A

Q.P. Code : 825201

(3 Hours) [Total Marks : 80

N.B. (1) Question No. 1 is compulsory
(2) Attempt any three out of remaining five questions
(3) Assumptions made should be clearly stated
(4) Figures to the right indicate full marks
(5) Assume sutaible data whenever required but justify that.

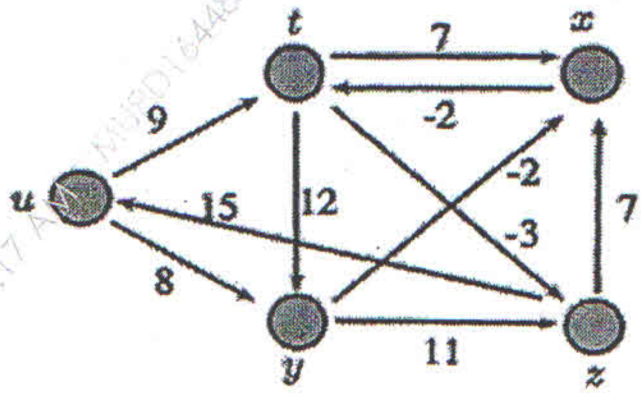
1 Write short note on following — 20
(a) Finding Closest pair
(b) Difference Constraints Problem
(c) Master Theorem
(d) Randomized Algorithm

2 (a) Describe amortized analysis with detail — 10
(b) Prove that Clique is NP-Complete — 10

3 (a) Find an optimal parenthesization for following matrix chain order. <5, 10, 23, 20, 15, 50, 60> — 10
(b) Explain Bipartite matching with Ford Fulkerson — 10

4 (a) Prove that 3-CNF is NP-Complete — 10
(b) Explain RSA with example — 10

5 (a) Explain Dijkstra Algorithm with example — 10
(b) Apply All pair shortest path Algorithm on given graph — 10



6 (a) Explain Graham Scan algorithm in detail — 10
(b) Explain Mesh algorithm for sorting — 10

M.E. Comp. Sem I CBCGS NID-2016 CBCGS.
Sub:- Elective -II MIS

Q. P. Code : 855301

(3 Hours) **[Total Marks : 80**

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

(2) Attempt any 3 questions out of rest.

(3) Figure to the right indicate full marks.

(4) All questions carry equal marks.

1. College wants to design database for examination system.

a) Design tables with assuming suitable attributes and normalize the database. **5**

b) Define primary key, foreign key with its importance in database design. List Primary and foreign key in each table of above tables. **5**

c) Draw Star schema and Snowflake schema for above design. **5**

d) Explain difference between star schema and snowflake schema with purpose of normalization. **5**

2. a) Explain Several ways in which IT impacts employees at work. Also explain how IT might change manager's job. **10**

b) Explain E-Commerce with its various types. **10**

3. a) Explain Characteristics of data warehouse. Differentiate between data warehouse and data marts. **10**

b) Explain Customer relationship Management with its various types. **10**

4. a) Define Big Data. Explain various characteristics and issues in Big Data. **10**

b) Explain various Business intelligence Applications for presenting Results. **10**

5. a) Explain traditional system development life cycle. **10**

b) Explain various threats to information system. **10**

6. Write short notes on any two **20**

a) Enterprise Resource planning

b) Pervasive Computing

c) Cloud computing model

ME(Comp) sem I - (CBGS) User Experience Design 15/12/16

Q.P. Code : 825901

(3 Hours) **[Total Marks : 80**

N.B: (1) Question no.**1 compulsory**
(2) Attempt any **three** from remaining
(3) Assume necessary data

1. Solve any **four** **20**
   (a) What is interface design?
   (b) What is mental model?
   (c) What are product objectives needed in strategy plane
   (d) Explain elements of testing in brief ?
   (e) What is qualitative and quantitative research? Explain in brief

2. (a) Explain UX Design Process **10**
   (b) According to type of user (beginner, expert, intermediates) discuss the needs with example **10**

3. (a) Explain Visual Design Principles. **10**
   (b) Suggest modification for any news website. Give reasons for the same. **10**

4. (a) What are Types of Usability Testing? **10**
   (b) Why to create test plan? **10**

5. (a) How Usability Test feedback help to improve the design **10**
   (b) What is Storyboarding? **10**

6. Write short note on **20**
   (a) User's conceptual cognition
   (b) Elements of User Experience

ME Comp SEM-I (CBGS) 15/12/2016
Advance Database Design

Q. P. Code : 660900

(3 HOURS) **[Total Marks: 80]**

N.B.: (1) Question no. 1 is compulsory.
(2) Attempt any three questions from remaining.
(3) Assume suitable data wherever necessary.

Q1. (a) Explain Data warehouse architecture in sort. 05
(b) Explain ORDBMS. 05
(c) Explain Client-server architecture. 05
(d) Explain OLAP operations in brief. 05

Q2. (a) What is parallel database? Explain architecture of parallel database. 10
(b) Explain different types of fragmentation in distributed database. 10

Q3. (a) Design Star and snowflake schema for railway reservation system. 10
(b) Explain mapping of EER to relational model with example. 10

Q4. (a) Describe ODL schema for student database. 10
(b) What is deadlock? Explain distributed deadlock handling. 10

Q5. (a) Explain two phase commit protocol in distributed database. 10
(b) Explain the need of replication. How queries are processed in replicated distributed databases? 10

Q6. (a)Write short notes on **(any two)** 20
(i) Multimedia databases
(ii) Temporal Database
(iii) Database security
(iv) Normalization in database

Sem I ME (Comp) (Choice-Based)

Adv. Operating System 13/12/2016

Q.P. Code : 825400

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question **No.1** is **Compulsory.**
(2) Attempt **any three** questions out of remaininig **five** questions.
(3) Assume suitable data whenever required but jusify the same.
(4) Assumption made should be clearly stated.

1. (a) A distributed system may have multiple, independent critical regions. Imagine that process 0 wants to enter critical region A and process 1 wants to enter critical region B. Can Ricart and Agrawala's algorithm lead to deadlocks? Explain your answer. **5**
   (b) Compare Cyclic and Table Driven-Schedulers. **5**
   (c) What are the different design goals of Mach distributed operating system? **5**
   (d) What is logical clock ? With the help of example explain limitation of logical clock. **5**

2. (a) What are the problems associated with two phase locking? Explain how Two phase locking increases concurrency in transaction execution relative to static locking. **10**
   (b) What is the selection criterion for load sharing algorithm based on performance for different system under consideration? Explain. **10**

3. (a) Give comparative performance analysis of different mutual exclusion algorithms in terms of response time, synchronization delay, message traffic, light load, heavy load. **10**
   (b) Explain Rate Monotonic scheduling Algorithm (RMA). What is Schedulability Test for RMA? **10**

4. (a) Consider following set of periodic tasks. If cyclic scheduler is used to run these tasks then what appropriate frame size should be selected? Task T_1 = (E_1=1, P_1=5), Task T_2= (E_2=1, P_2=10), Task T_3= (E_3=2, P_3=20), and Task T_4 = (E_4= 2, P_4=20), Where E is execution time and P is period. **10**
   (b) Explain Non-blocking Commit protocol for single site failure. **10**

TURN OVER

5. (a) Explain priority inversion protocol (PIP) to share critical resource among tasks. **10**

(b) What is byzantine agreement problem? With the help of example prove that no solution exist for byzantine agreement problem for three processors. **10**

6. (a) Explain process management in Amoeba distributed operating system. **10**

(b) Explain different concurrency control algorithms for fully replicated database systems. **10**

M.E. (Computer) - I
CBSGS
Network Design & Mgmt.

13/12/2016

QP Code : 64311

(3 Hours) Total Marks: 80

Instructions: - 1) Question No 1 is compulsory; solve any 3 questions from remaining 5 questions.
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.

Q 1 a) In the Hospital there is a main block and three wards in the campus. The main block is the administrative block where registration of new patients takes place. The main block has 5 floors. The hospital has identified hospital management software, which should be accessible by the employees. The software is installed on a server at the administrative block. At the ground floor, there are 15 computers at the billing section. At other floors, there is one computer user each. The farthest distance between the computer on the top most floor and the ground floor is less than 70 meters. The wards have 5 floors each, with 10 computers in the ground floor of each ward. The distance between the wards and the blocks are less than 80 Meters. The computers in the wards may be increased based on future expansion plans.

1. Hardware requirement analysis in main block with quantity.
2. Hardware requirements analysis in wards.
3. The employees should receive dynamic IP addressing from a central server.
4. Network should be loop free at Layer 2
5. Every computer should be able to access the hospital management software from each of the location using a fixed IP address.
6. IP Network design table.
7. Identify configurations on the hardware wherever appropriate.
8. Network topology diagram with necessary equipment's. (15)

b) What are the benefits of having hierarchy in addressing and routing models? (05)

Q 2) a) Why is it important to use a structured, systematic method for designing networks? What problems can occur if such methods are not used? (10)
b) With the help of diagram explain the architecture of Network Management. (10)

Q 3) a) Define Network management. Explain OSI network management model. (10)

b) Explain various SNMP Operations. (10)

Q4) a) What is remote monitoring? Explain relationship between control and data tables. (10)

b) Explain the process of applying the Addressing & the Routing Strategies in a network. (10)

Q 5) a) Compare and contrast the top-down network design method with the PDIOO method. (10)

b) What is the significance of queuing model? Explain M/M/1 queuing model. (10)

Q 6) a) Explain SNMP based ASN.1 data type structure? (10)

b) Differentiate between 10base 2, 10base T and 100base T of IEEE 802.3 (10)

BB-Con. 7930-16.

M.E (COMP) SEM I - 9/12/16, QP CODE : 825300

Advance Computer Network & Design (Time: 3hrs) (Marks 80)

NB: 1. Question No 1 is compulsory.
2. Attempt any three out of the remaining five questions.

Q1. (a) What are the various issues associated with resource allocation? 05
(b) Explain the concept of slow start mechanism of TCP 05
(b) Differentiate between proactive and reactive routing protocols 05
(d) Define the factors that affect network performance? 05

Q2. (a) An Engineering college in India has 3 departments with 5 labs in each dept, all housed in one building. Departments are on separate floors. There are 20 PCs in each lab and 5 servers which are all placed in a server room on the first floor. Each department and lab are identified by a unique subnet ID. All departments are connected via a LAN. The college has been sanctioned additional two new branches which will be housed in a new building 1 km away. Students in this building are to be given access to high bandwidth applications like online distance learning courses, MOOCs etc. Design the proposed Campus Network with detailed IP addressing using Class C addressing and subnetting. 12

Q2. (b) Discuss the characteristics and functions of each layer of a hierarchial network design. 08

Q3. (a) Compare and contrast: i) RIPv1 and RIPv2 ii) EIGRP and OSPF 10

Q3. (b) Explain the Random Early Detection method of congestion avoidance. What is the significance of Average Queue length in this method? 10

Q4. (a) How are Wireless LAN controllers configured for deterministic Redundancy? Compare N+1, N+N and N+N+1 WLC redundancy 10

Q4. (b) What is hidden terminal problem? Explain the MACA/W and MACA-BI algorithms. 10

Q5. (a) Explain the AODV routing protocol. How does it differ from the dynamic source routing (DSR) protocol? 07

Q5. (b) What are the deciding parameters for OSPF routers to become neighbours? Explain the role of DR and BDR in OSPF. How are the DR and BDR elected? 07

Q5. (c) Convert the following MAC addresses to EUI-64 addresses: 06
i) 0090.2716.fd0f ii) 0c0c.dede.1234
Use the prefix 2001:db8:1:1/64 for each address.

Q6. Write short notes on: (any two): 20
i) Data Center Virtualization technologies
ii) TCP congestion control mechanisms
iii) IPv6 addressing
iv) Software Defined Networking.

M.E (COMP) CBGS 9/12/16

Parallel Computing

Q.P. Code : 660401

(3 Hours) **[Total Marks : 80**

N.B. : (1) Question **No.1** is **compulsory**.
(2) Attempt **any Three** questions from remaining questions.
(3) Draw suitable **diagrams** wherever **necessary**.
(4) Assume suitable **data**, if **necessary**.

1. (a) Explain general model of shared memory programming. **10**
   (b) Discuss in detail parallel Quick sort algorithm with suitable example. **10**

2. (a) Explain various mapping techniques for load balancing. **10**
   (b) Explain parallel reduction in detail with the help of an example. **10**

3. (a) Discuss in detail classification of parallel computers? **10**
   (b) Explain DNS algorithm for Matrix multiplication? Discuss performance analysis of DNS algorithm. **10**

4. (a) Define parallel algorithm? Explain the design process of Parallel Algorithms. **10**
   (b) Explain different methods for minimizing the interaction overhead. **10**

5. (a) Describe different types of parallel algorithm models with examples. **10**
   (b) Explain Buffered and non Buffered Blocking massage Passing Operation? **10**

6. Write **any two** in brief : **20**
   (a) OpenMp
   (b) Cluster Computing
   (c) Parallel programming models
   (d) Systolic architecture
