M.E. Computer – Sem – I (CBGS) 26/11/15

Advanced Algorithms and Complexity.

QP Code : 29891

(3 Hours) [Total Marks : 80

N.B. (1)Question No. 1 is compulsory
(2) Attempt any **three questions** out of the remaining **five** questions
(3) Figures to the right indicate full marks
(4) Assume sutaible data whenever required and justify them

Q.1 (a) Find LCS for X="ABCDABCEAAB" Y="ACDABCABDAC" [10M]

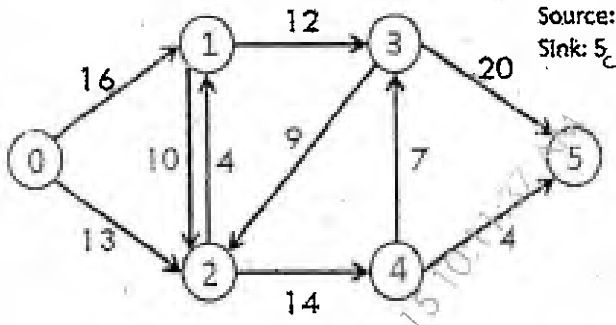
(b) Explain complexity of quicksort in all cases. [10M]

Q. 2 (a) Prove that Set cover is NP-Complete [10M]

(b) Explain Bellman Ford algorithm with example [10M]

Q. 3 (a) Find optimal parenthesization of a matrix chain product whose sequence of dimension is <5,10,20,10,15,35,6> [10M]

(b) Find Maximum flow for following problem [10M]



Q. 4 (a) Solve the following Linear program using Simplex Method [10M]

Maximize $7x + 5y$

Subject to $2x + y \leq 100$

$4x + 3y \leq 240$

$x, y \geq 0$

(b) What is asymptotic notation? Solve following using master theorem. [10M]

1) $T(n)=4T(n/2)+n^3$

2) $T(n)=16T(n/4)+n$

Q.5 (a) Run the knapsack algorithm on the following data [10M]
n = 4 (# of elements), Capacity C = 5 (max weight)
Elements (weight, benefit): (2,3), (3,4), (4,5), (5,6)

(b) Explain String Matching with finite automata in detail. [10M]

Q. 6 Write short note on following [20M]

(a) Online paging Problem

(b) K-Means Problem

(c) Relabel to Front algorithm

(d) Zero sum games

BB-Con.8696-15.

M.E. Signal processing (I) (CBGS)

DSP processors. 4/12/15

QP Code : **31758**

(REVISED COURSE)

(3 Hours) [Total Marks : 80

N.B.: (1) Question **No.1** is **compulsory.**
(2) Attempt any **three** questions out of remaining **five** questions.
(3) Assume **suitable** data wherever required with justification.
(4) **Figures** to the **right** indicate full marks.

1. A) Write an assembly language program to implement PI Controller. **10**
   B) Explain the functional blocks of Digital Signal Processor used to implement above expression. **10**

2. A) Write an Embedded "C" program and explain what is hardware initialization to implement Real time signal Processing. **10**
   B) Explain various data types supported by TMS320C6x DSP. **10**

3. A) Compare the architecture features of fixed point processors versus floating point Digital Signal Processors. **10**
   B) For MAC implementation draw Time Space diagram explain the pipelining mechanism of TMS 320c54xx processor. Give percentage of throughput efficiency for the given example. **10**

4. A) Draw the functional diagram of ADSP-210xx processor and explain its bus structure. **10**
   B) List the on chip peripherals and their functions. **10**

5. A) Explain various addressing modes ofTMS320c54x Digital Signal Processor. **10**
   B) Explain circular addressing and bit reversed addressing modes. **10**

6. A) Explain advanced bus structures and its advantages in DSPs. **10**
   B) Explain Microprocessor & Microcomputer mode in DSP. **10**

ME Comp Sem-I CBGS
Parallel Computing 30/11/15

Q.P. Code : 29894

(3 Hours) [Total Marks : 80

N.B : 1) Q.1 is compulsory .

2) Attempt Any 3 out of remaining .

3) Assume suitable data wherever required .

Q.1 a) Discuss in detail classification of parallel computers? (10)

b) Define parallel Algorithm ? Explain the design process of Parallel Algorithms. (10)

Q.2 a)Explain row wise 1-D & 2-D partitioning parallel algorithm for Matrix-Vector Multiplication (10)

b) What is the need for decomposition? List & explain various decomposition Techniques with examples. (10)

Q.3 a) Discuss in detail parallel Quick sort algorithm with suitable example . (10)

b) What is Massage passing programming? Explain in details blocking & Non blocking Message Passing operation? (10)

Q.4 a) Explain various mapping techniques for load balancing . (10)

b) Discuss different performance metrics for parallel systems . (10)

Q.5 a) Describe different types of parallel programming models with examples. (10)

b) Explain different methods for minimizing the interaction overhead. (10)

Q.6 Write short notes on(Any 2) (20)

a. OpenMp.
b. Grid Computing.
c. Parallel execution of Prim's Algorithm .
d. Parallel Virtual Machine(PVM) .

M.E (Comp) sem I CBGS

Elective II – E- Business Technology

8/12/2015

Q.P. Code : 29921

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

N.B [1] **Question one is compulsory**
[2] **Attempt any three questions from remaining**

Q1	a)	Explain portal and its different types?	05
	b)	How does e-business differ from e-commerce?	05
	c)	How is the use of cookies affecting security and privacy issues?	05
	d)	Explain web services & how it impact on e-business?	05
Q2	a)	Compare the e-business models, with advantages, disadvantages and application domain?	10
	b)	Give suggestion to design electronic based Gift & Flower web site?	10
Q3	a)	Explain Different Revenue models for Web Portals and Virtual Communities?	10
	b)	Write e-business Security issues and policies?	10
Q4	a)	List different threats that pose on client computers? What protection mechanism can reduce or prevent these threats?	10
	b)	Give details of web hosting techniques?	10
Q5	a)	Explain organizational and managerial issues for e-Business?	10
	b)	Explain the Environment Forces affecting E- business plan?	10
Q6	a)	How SWOT analysis help to improve business?	10
	b)	Explain the role played by government on issues like cyber-crime & taxation for e – business?	10

M.E. Computers - sem I (CBGS).

2/12/15

NDM

QP Code : 29896

(3 Hours) [Total Marks: 80]

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

(2)Solve any three questions out of the remaining five questions.

Q1. A company has its central office in Dadar.It has three sub- offices in Andheri, Vashi and Chembur. Total number of nodes required at Dadar is 400 while at the sub-offices 72 nodes each are required. 20

Design the office structure with classless addressing scheme with any suitable starting address.

Q2. Discuss the business and technical challenges of an organization which a network designer must understand. Discuss also the time and delay considerations. 20

Q3.a.What are the different steps of top-down network design? List typical technical goals and business goals. 10

b.Explain the relevance of queuing theory in Network design. 10

Explain M/M/1 queuing model.

Q4.a.Discuss the common network problems and various challenges faced by an IT manager to manage the network of an enterprise. 10

b.Discuss the two –tier and three- tier organization model of a network management system. 10

Q5.a. Explain SNMP community profile and SNMP access policy. 10

b.Compare SNMP v1& v2 network management architecture. 10

Q6. Write short notes on (ANY TWO):- 20

(a) ASN.1 notation.
(b) TMN Functional Architecture.
(c) RMON
(d) Network management standards.

M.E Computer (I) (CBGS) 4/12/15
Advanced DataBase Design

QP Code : 29908

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

N.B. 1. Question No. 1 is **compulsory**
2. Attempt any **three** out of remaining
3. Assume suitable data if **necessary** and **justify** the assumptions
4. Figures to the **right** indicate full marks

Q1 [A] Consider the relation REFRIG(MODEL#, YEAR, PRICE, MANUF_PLANT, COLOR), which is abbreviated as REFRIG(M, Y, P, MP, C) and the following set F of functional dependencies 09

$F=\{M \rightarrow MP, \{M, Y\} \rightarrow P, MP \rightarrow C\}$

a) Evaluate each of the following as a candidate key for REFRIG, giving reasons why it can or cannot be a key: {M}, {M, Y}, {M, C}

b) Based on the above key determination, state whether the relation REFRIG is in 3NF and in BCNF giving proper reasons.

c) Consider the decomposition of REFRIG into D = {R1(M, Y, P), R2(M, MP, C)}. Is this decomposition loss less? Show why

[B] Explain 4NF and 5NF with example 05

[C] Define 3NF and BCNF 06

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

(i) Draw EER diagram

(ii) Draw class diagram

(iii) Write 5 suitable queries in OQL.

Q3 [A] Explain star schema and snow flake schema with example 10

[B] 10

T1	T2
	Begin_transaction
Begin_transaction	Read(x)
Read(x)	x=x*2
x=x+10	Write(x)
Write(x)	commit
commit	

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

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

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

[B] Explain Apriori Algorithm with example 10

BB-Con. 9808-15.

Turn Over

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

Site 1 :

Employee									
Fname	Minit	Lname	SSN	Bdate	Address	Sex	salary	SSSN	DNo

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

Site 2 :

Department			
Dname	Dnumber	Mgrssn	Mgrstartdate

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

[B] Write Basic Timestamp Ordering Algorithm. 05

Q6 Write short notes on the following 20

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

M.E. Computer (I) (CBGS)

Machine Learning

4/12/15

QP Code : **29905**

(3 Hours) [Total Marks : 80

N. B. : (1) Questions No.1 is **Compulsory**.
(2) Answer any **three** out of the remaining questions.
(3) **Figures** to the **right** indicate marks **allotted**.
(4) Make suitable assumptions wherever required.

1. (a) What are the issues in machine learning? 5
(b) Explain candidate-elimination algorithm? 5
(c) What are the factors that improves convergence in back propagation algorithm? 5
(d) What is overfitting and what are the effects? 5

2. (a) Using the table below create a classification model using Bayesian techniques. Indicate how to otilize the model to determine whether a player plays tennis or not given the outlook as Sunny, Temperature as Cool, Humidity as High and Wind as Weak. 10

Day	Outlook	Temperature	Humidity	Wind	PlayTennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

(b) What is a dendogram and where is it used? 10

[TURN OVER

BB-Con. 9807-15.

3. (a) Explain the working of a Hidden Markov Model? What are the three basic problems of HMM? 10

(b) State K-Means algorithm. Perform clustering for k=2, for the following data 10
{2,4,10,12,3,20,30,11,25,5,22,14}

4. (a) A simple example from the stock market involving only discrete ranges has profit as categorical attribute with values (up,down) and the training data is given by 10

AGE	COMPETITION	TYPE	PROFIT
OLD	YES	SOFTWARE	DOWN
OLD	NO	SOFTWARE	DOWN
OLD	NO	HARDWARE	DOWN
MID	YES	SOFTWARE	DOWN
MID	YES	HARDWARE	DOWN
MID	NO	HARDWARE	UP
MID	NO	SOFTWARE	UP
NEW	YES	SOFTWARE	UP
NEW	NO	HARDWARE	UP
NEW	NO	SOFTWARE	UP

Apply decision tree algorithm and show the generated rules

(b) What is case-based reasoning? 10

5. (a) Explain k-nearest learning algorithm with suitable example 10

(b) Why short hypothesis is preferred? 10

6. (a) Solve OR logic using perceptron training algorithm. 10

(b) What are the issues in decision tree learning? 10

ME Computer (I) (CBGS)
Software testing.

4/12/15

QP Code : 29902

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

Note: (i) Q. No. 1 is compulsory
(ii) Attempt any three questions from the remaining five questions
(iii) Assume suitable data wherever necessary.
(iv) Figures in the right indicate full marks.

1. Explain the following: (a) Data declaration error (b) Control flow error (c) subroutine parameter errors (d)computation errors (e) I/O errors (5x4=20)

2. (a) What is the difference between white box, black box, and gray box testing? (10)

   (b) Explain object Oriented testing (10)

3. (a) Explain test harness and acceptance testing (10)

   (b)What are the categories of defects? What is the difference between a defect and a failure? Explain the concept of defect cascading? (10)

4. (a)What are different types of verifications? What is the difference between verification and validation? (10)

   (b). How does testing affect risk? Explain GUI testing. (10)

5. (a)What is test coverage and what are the different types of coverage techniques? (10)

(b) A defect which could have been removed during the initial stage is removed in a later stage. How does this affect cost? (10)

6. (a)Explain test design strategies. (10)

   (b)Explain requirement traceability and its importance. (10)

BB-Con. 10355-15.

M.E Computer (I) (CBGS). 8/12/15

High performance computing

Q.P. Code : 29915

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

Note. (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.

Q 1	Explain briefly a. Grid service factory b. Difference between web service and grid service c. Benefits to cloud provider d. Paravirtualization	20
Q 2 (a)	Explain SaaS, its benefits and hurdles.	10
Q 2 (b)	Categorize the data to be monitored by the Grid monitor and explain how it is monitored	10
Q 3 (a)	Explain the characteristics of Virtualization that make it suitable for cloud computing	10
Q 3 (b)	Explain the strategies used for job selection and resource selection	10
Q 4 (a)	Explain the different security concerns faced by the grid	10
Q 4 (b)	Explain the different cases where the cloud computing may not appropriate	10
Q 5 (a)	Explain the need for credential delegation and single sign on and how it is performed.	10
Q 5 (b)	Explain the ways the client desktop can be virtualized	10
Q 6	Explain in brief any two a. Features of Condor b. OGSA grid service structure c. Storage as a service provider	20

———— X ———— X ————