MSc-IT PART-I
Paper-II
Mobile Computing advanced Computing (3 Hours) Networks

17th APRIL 2009

Con. 1630-09. CR-5784

[Total Marks : 75

N.B :- (1) Attempt any **five** questions but **not more** than **three** questions from any section
(2) Answers to the **two** sections must be written in **separate** answer books and should be submitted **separately.**
(3) Write answers to **same** question **together**.
(4) **Each** question carries **15 marks**.

Section I

1. a) Explain what are the problems encountered during propagation of signals in a wireless network. 05
   b) Explain how does code division multiplexing help in transmission of information over wireless networks? State its advantages and disadvantages. 05
   c) Explain the reasons why baseband signal cannot be directly transmitted in wireless systems. 05

OR

2. a) What is roaming? List and explain the steps for roaming between access points. 06
   b) Write a shoet note on: 05
      i. Exposed terminals
      ii. Tele services in GSM networks.
   c) What are foreign and home agents? Explain the registration of a kobile node via the foreign agent with the home agent. 04

3. a) State the characteristics and system arctitecture of a DECT network. 06
   b) What are ad-hoc networks? State their advantages and disadvantages. 04
   c) Write short note on mobile terminated calls. 05

OR

4. a) Write a short note on MACand Location management. 04
   b) What is DHCP? Explain the process of client initialization via DHCP. 06
   c) State advantages and disadvantages of HAWAII. 05

5. a) What are the ggeneral problems of Mobile IP regarding security and support of quality of service? 04
   b) How does caching improve access time and reduce bandwidth requirements? Explain. 05
   c) Write short note on : 06
      i. WAP
      ii. Reservation TDMA

OR

6. a) How and why does I-TCP isolate problems on the wireless link? What are the main drawbacks of this solution? 06
   b) What problems of HTTP can WSP solve? Why are these solutions especially needed in wireless mobile environments? 05
   c) What is broadcasting? Explain inbrief digial audio broadcasting. 04

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Section II

7.	a	Explain the situations where LAN switch is prefer instead of routers.	8
	b	List the steps involved in Network Designing.	7
		OR	
8.	a	Discuss the advantages and disadvantages of SONET.	8
	b	Write note on ESCON (Enterprise System Connection) Architecture.	7
9.	a	Discuss the benefits of Frame Relay over Private Line Networks.	8
	b	Compare Open and Closed Loop architectures.	7
		OR	
10.	a	Write note on Link Access Protocol, Balanced (LAPB)	8
	b	Explain the various possible causes of delay in the network.	7
11.	a	Write note on Switched MultiMegabit Data Service (SMDS).	8
	b	Discuss the technical requirements and strategies that should be consider before designing the network.	7
		OR	
12.	a	Describe the situations where the following technologies are preferred i. IP Service ii. Public Data Service iii. X.25 Service iv. Private Line	8
	b	What is TCP? Give the TCP frame format and TCP/IP functions.	7

MSc - IT PART - I
Paper IV
27th APRIL 2009

Con. 1635–09. Data Warehousing and Mining and Advanced Database System CR–5850

(3 Hours) [Total Marks : 75

N.B (1) Attempt any **five** questions but **not more than three** questions from any section
(2) Answers to the **two** sections must be written in **separate** answer books and should be submitted **separately.**
(3) Write answers to **same** question **together**
(4) **Each** question carries **15 marks**

Section I

Q1 a) What do you mean by strategic information (SI)? Discuss why there is need for strategic information. Explain any four characteristics of SI 8

b) How are datawarehouse projects different from OLTP projects? Describe any six differences 7

OR

Q2 a) What is information package,explain in short.explain hierarchies & business metrics with at least four examples 7

b) Write a short note on dimension table & fact table 8

Q3 a) Bad data leads to bad decision.comment. Discuss the data pollution sources 7

b) Write a short note on slowly changing dimensions 8

OR

Q4 a) Explain drill-down-&roll up and slice-&-dice 8

b) Write a short note on KDD process robot. 7

Q5 a) State different types of clustering methods & explain K means clustering 8

b) Define neural network. Discuss the advantages & disadvantages of 7

OR

Q6 a) Write a short note on spatial mining. 7

b) Define data mining & explain any four applications of data mining in short . 8

Section II

Q. 7 a John Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer. Each musician that records at John has an Registration No., a name, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone. Each instrument used in songs recorded at John has a unique identification number, a name (e.g., guitar, synthesizer,, flute) and a musical key (e.g., C, B-flat,E-flat). Each album recorded on the John has a title, a copyright date, a format (e.g., CD or MC), and an album identifier. Each song recorded at John has a title and an author. Each musician may play several instruments, and a given instrument may be played by several musicians. Each album has a number of songs on it, but no song may appear on more than one album. Each song is performed by one or more musicians, and a musician may perform a number of songs. Each album has exactly one musician who acts as its producer. A musician may produce several albums. Draw an ER diagram for the schema. 15

OR

Q. 8 a What is the need of OODBMS? Discuss the various type constructors. How are they used to create complex object structures? 8

b Highlight the features of object oriented database. Give the comparison between OODBMS and RDBMS. 7

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Q. 9	a	Explain the extensible data types. Discuss the various implementation issues regarding extended type systems.	8
	b	Write note on distributed databases.	7
		OR	
Q. 10	a	What are centralized databases? List out its characteristics. Compare centralized and distributed databases.	8
	b	Discuss the architectures of parallel databases.	7
Q. 11	a	Differentiate between active and deductive databases.	8
	b	What is the difference between XML schema and XML DTD? Explain XML querying.	7
		OR	
Q. 12	a	What is a Mobile database? What are its advantages? State applications of Mobile databases?	8
	b	What is spatial database? How they differ from regular database? Explain the typical types of spatial queries.	7

MSc-IT PART-I
Paper III
20th APRIL 2009

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Image Processing Speech Recognition CR-5829

Con. 1632-09.

(3 Hours) [Total Marks : 75

N.B (1) Attempt any **five** questions but **not more** than **three** questions from any section

(2) Answers to the **two** sections must be written in **separate** answer books and should be submitted **separately.**
(3) Write answers to **same** question **together**
(4) **Each** question carries **15 marks**

Section I

Q.1 A Explain zooming and shrinking in brief. 7

B Write a short note on brightness adaptation & discrimination. 8

OR

Q.2 A Discuss the "connectivity of pixels". 7

B What is Fourier Transform? Apply 2 D Fourier Transform on the following image. 8

6	8	10	8
6	10	8	4
10	8	6	5
4	4	8	8

Q.3 A Write a short note on Gray level Slicing & bit plane slicing technique used in image enhancement technique. 7

B Explain the basic steps for filtering in the frequency domain 8

OR

Q.4 A Write a short note on Histogram matching. 7

B Apply spatial filtering using low pass filter mask to the following image. Also apply median filter. Apply the mask on the center pixel only. Compare the results of both the filters. 8

1	1	1	1	1
10	10	10	10	10
1	1	1	1	1
10	10	10	10	10
1	1	1	1	1

Q.5 A Define Image compression. Apply Huffman code for the following. 7

A1	0.2
A2	0.4
A3	0.1
A4	0.1
A5	0.1
A6	0.1

B Write a short note on Lossless predictive model used in image compression 8

OR

Q.6 A Define thresholding. Explain global thresholding algorithm 7

B Define representation. Explain thinning algorithm used in representation 8

[TURN OVER

Section II

Q7 a) Explaining the sound production mechanism in human being. Illustrate the production of voiced & unvoiced sounds. Give the examples of each type 5

b) Explain acoustic phonetic vowel classified 5

c) Explain the interdisciplinary nature of speech recognition science. Briefly mention the role of digital signal processing in speech recognition. 5

Q8 a) Describe different knowledge sources and their role in AI approach to speech recognition 5

b) What is spectrogram? What information is available from the spectrogram? What is voiced, unvoiced & silent segment of speech signal wave form? 5

c) What are phonemes ? Give the general classification of phonemes in English language. 5

Q9 a) Explain in brief the importance of LPC model in speech recognition. Write the LPC analysis equation and give the matrix form presentation of auto correlation function & predictor coefficient. [Derivation of the matrix form is not expected] 8

What does the following LPC parameter represents N , M ,P ,Q & K

b) Draw the diagram of complete bank of filter analysis model. Describe the effect of every block on speech signal. 7

Q10 a) Explain the importance of speech endpoint detection. List the reasons for the errors in end point detection. What are the various approaches for end pt detection? Explain in brief. 8

b) Describe vector quantized based speech recognition system 7

Q11 a) What is state transition matrix in HMM? 8

What is the assumption in using HMM for speech recognition? Explain the meaning of following notations used in HMM for speech recognition N, M , A ,B & $\prod$.

b) Explain the general notation for the connected word –recognition problem 7

What are the different problem needs to be resolved in order to solve the connected word recognition problem.

Q12 a) What are the disadvantages for using whole word speech models for continuous speech recognition ? What are the several possible choices for subword units that can be used to model speech? 8

b) Discuss the essential requirement to decide whether a proposed task is suitable for speech recognition deployment .Explain the method of handling recognition error. 7

MSc-IT PART-I
Paper-I
15TH APRIL 2009

we March 09 - (2) 334

Con. 1628–09.

Computer Simulation and Modeling Programming with components (3 Hours) CR–5727

[Total Marks : 75

N.B (1) Attempt any **five** questions but **not more** than **three** questions from any section

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(3) Write answers to **same** question **together**

(4) **Each** question carries **15 marks**

Section I

Q1 a) Describe the areas in which simulation can be applied 7

b) A bank's ATM centre has only one ATM machine operating. Customers arrive at this centre at random from 1 to 10 minutes. The probabilities of arrival distribution and service distribution are listed as below. Develop the simulation table for 10 customers. 8

Time between arrivals	1	2	3	4	5	6	7	8	9	10
Probability	0.10	0.05	0.12	0.10	0.13	0.12	0.16	0.10	0.10	0.02

Service Time	1	2	3	4	5	6
Probability	0.05	0.10	0.20	0.30	0.25	0.10

Determine the average waiting time for a customer as well as the probability of a customer to wait in the queue.
Use the following random numbers
Random numbers for arrivals : 25, 31, 15, 88, 64, 12, 73, 36, 45
Random numbers for Service : 10, 22, 34, 16, 59, 74, 48, 37, 51, 18

(OR)

Q2 a) Explain the major concepts in discrete-event simulation 7

b) i) For an exponentially distributed random variable X, find the value of λ that satisfies the following relationship: 8

$P(X \leq 3) = 0.9\ P(X \leq 4)$

ii) The time to service customers at a bank teller's counter is exponentially distributed with a mean of 50 seconds. What is the probability that the two customers in front of an arriving customer will each take less than 60 seconds to complete their transactions?

Q3 a) How to evaluate and select simulation software? 7

b) Find the probability that $6 < X < 8$ for each of the following distributions: 8

i) Uniform
ii) Normal
iii) Triangular
iv) Exponential

(OR)

Q4 a) Describe the inverse transformation technique for exponential distribution 7

b) The sequence of numbers 0.54, 0.73, 0.98, 0.11 and 0.68 has been generated. Use Kolmogorov-Smirnov test with $\alpha = 0.05$ to determine if the hypothesis that the numbers are uniformly distributed on the interval [0,1] can be rejected. (The critical value $D\alpha$ is 0.565). 8

[TURN OVER

Q5 a) Define and state the steps in acceptance-rejection technique 7

b) Develop a random variate generator for a random variable whose pdf is 8

$$f(x) = \begin{cases} 1/3, & 0 \le x \le 2 \\ 1/24, & 2 \le x \le 10 \\ 0, & \text{otherwise} \end{cases}$$

(OR)

Q6 a) What suggestions and steps can be followed in verification of simulation models? 7

b) Describe simple linear regression 8

SECTION II

Q7 a) Explain the concept of distributed and web object system in detail? 7

b) What is bean component? Explain the architecture of enterprise java beans? 8

(OR)

Q8 a) What is Interface Definition Language? And show how methods are used in IDL? 7

b) Explain the different situations under which AddRef and Release Method is called? 8

Q9 a) What is apartment? Explain the different threading model supported by it? 7

b) Explain the examples for implementing the COM interface pointers in java and Visual Basic. 8

(OR)

Q10 a) Create a ATL component in VC++ and show the integration only in C++ for the Calculator class containing the methods: add(),sub(),mul(). And also write the steps. 7

b) Explain the functions of 8

a) CoInitializeEx and CoUnInitialize .

b) IOleItemContainer and IClassFactory

Q11 a) Explain the need of dynamic decomposition in COM? 7

b) Explain the following services with an example: Event Service, Externalization , Persistent Object and Licensing. 8

(OR)

Q12 a) Explain the In-process and out-process server with an example? 7

b) How do abstract based classes function as binary interfaces? 8