M.Sc. (Information Technology) Part – I
Computer Simulation &
Modelling & Programming with Components
April: - 2016

QP Code : 18459

(3 Hours) [Total Marks: 75]

N.B.
1. All questions are compulsory.
2. Answers to the two sections must be written in the same answer books and should be submitted together.
3. Write answers to same question together.

SECTION – I

Q 1. a Explain the different purposes for which simulation can be used. 6
b List advantages and disadvantages of Simulation. 6

OR

Q 1. a Explain the different types of simulation model. 6
b Explain the steps in simulation study with the help of diagram. 6

Q 2. a Explain the concept of Discrete-Event Simulation. 6
b A baker is trying to determine how many dozens of bagels to bake each day. The 7
probability distribution of the number of bagel customers is as follows:

Number of customers/day	8	10	12	14
Probability	0.35	0.30	0.25	0.10

Table 1 :- Probability distribution of number of customers/day

Customers order 1, 2, 3 or 4 dozen bagels according to the probability distribution given in Table 2.

Number of dozen ordered / customer	1	2	3	4
Probability	0.4	0.3	0.2	0.1

Table 2: - Probability distribution of bagels ordered by customer.

Bagels sell for Rs.5.40 per dozen. They cost Rs. 3.80 per dozen to make. All bagels not sold at the end of the day are sold at half price to a local grocery store. Based on 5 days of simulation, how many dozen bagels should be backed each day?
Random digits for number of customers/day and dozens ordered/customer is given table 3 and table 4 respectively

R.D. for Customers/Day	44	33	95	77	44

Table 3:- Random digits for bagel customers/days.

R.D for Dozens ordered /Customer	8	2	4	8	1	6	3	0	2	0	9	1	0	0	6	3	8	5	1	3	5	0	7	1	9	2
	6	7	5	3	4	0	1	0	2	9	8	6	3	4	0	7	5	9	6	3	9	0	2	8	7	5

Table 4:- Random digits for dozens ordered/customer.

OR

Contd...

Q 2. a How would you select simulation software? Explain the features of simulation software. 6
      b i) A recent survey indicate that 82% of single women aged 25 years old will 7
              be married in their lifetime using the binomial distribution , find the
              probability that two or three women in a sample of twenty will be married.
         ii) The Hawk are currently winning 0.55 of their games .There are 5 games in
              the next two weeks. What is the probability that they will win more games
              than they lose?

Q 3. a Explain the linear congruential method for random number generation? 6
      b i) Use the mixed congruential method to generate a sequence of three two- 7
              digit random numbers with $X0 = 37\ a = 7$, c=29, and m = 100.
         ii) The sequence of numbers 0.54, 0.73, 0.98, 0.11, and 0.68 has been
              generated. Use the Kolmogorov-Smirnov test with $\alpha = 0.05$ to learn
              whether the hypothesis that the numbers are uniformly distributed on the
              interval [0, 1] can be rejected.[The Critical value $D_{0.05}=0.565$]

OR

Q3. a Explain model Verification and Validation process 6
     b Explain output analysis of terminating simulations with examples. 7

SECTION – II

Q 4. a Explain the reason to distribute for the centralized object. Explain the advantage of 6
          distributed system.
      b "COM is better than C++ distribution". Justify. 6

OR

Q 4. a In COM why is it required to separate the interface from implementation? 6
      b What is COM Interface definition language (IDL)? Explain the syntax for defining 6
          COM methods is used in Interface Definition language (IDL).

Q 5. a Define the IUnknown Interface. Explain the three methods of IUnknown Interface 6
      b Write a short note i) MTA and RTA ii) Cross Apartment. 6

OR

Q 5. a Explain the COM Activation Model using Service Control Manager(SCM) with 6
          the help of diagram
      b Write a note on i) IClassFactory Interface ii) CoCreateInstanceEx 6

Q 6. a What is Java Native Interface(JNI)? Explain the step for creating java native method 6
          with an example.
      b State and explain the different types of Common object Request Broker Architecture 7
          (CORBA) Services.

OR

Q6. a What are Enterprise Java Beans? Explain the architecture of Enterprise Java 6
         Beans.
     b How to you integrate the COM Object in a Web application? 7

M.Sc. (Information Technology) Part – I
Mobile Computing &
Advanced Computer Networks
April: - 2016

Code : 18513

(3 Hours)

[Total Marks: 75]

N.B.
1. All questions are compulsory.
2. Answers to the two sections must be written in the same answer books and should be submitted together.
3. Write answers to same question together.

SECTION – I

Q 1.	a	Explain Minimum shift keying with example.	6
	b	Explain the GPRS reference model.	6

OR

Q 1.	a	What are the different voice and data services that can be integrated in GSM? Explain.	6
	b	Differentiate among GEO, LEO, and MEO.	6

Q 2.	a	What are the problems of Signal propagation? Why do radio waves always follow a straight line? Why is reflection both useful and harmful?	6
	b	Explain the term Multiple access with collision (MACA). How it is still fail in case of hidden/exposed terminals for Mobile stations in changing transmission characteristics?	7

OR

Q 2.	a	Explain the system architecture and Protocol Architecture of IEEE 802.11.	6
	b	What are the different functions of link manager protocol? Explain.	7

Q 3.	a	What is BRAN? What are the different network types specified by BRAN? Explain.	6
	b	Explain the architecture of Wireless Application Protocol.	7

OR

Q3.	a	Explain the reverse tunnelling for mobile IP.	6
	b	With the help of a neat diagram explain the wireless application environment logical model.	7

SECTION – II

Q 4.	a	How are standards created? Explain.	6
	b	Discuss the selection of the following devices in network design process:	6

    i) Repeaters
    ii) Modems, Line drivers/Limited distance Modems
    iii) CSU and DSU
    iv) Hubs and Lan Switches

OR

Q 4.	a	Compare bridging/switching and routing.	6
	b	Explain the steps involved in network design.	6

Q 5.	a	Explain the components of Frame Relay.	6
	b	Explain the three most common MAC physical interfaces for the IEEE 802 architectural model.	6

OR

Q 5.	a	Explain any two data-link layer protocols.	6
	b	Explain ISDN in detail.	6

Q 6.	a	Compare X.25 and X.75.	6
	b	Explain the switched megabit data service in detail.	7

OR

Q6.	a	Draw the B-ISDN protocol reference model and explain the ATM layer.	6
	b	Discuss the business and technical challenges and requirements faced by the organizations.	7

WT-Con. 1725-16.

[Total Marks: 75]

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3. Write answers to same question together.

SECTION – I

| Q 1. | a | What is data warehouse? Why is it an environment and not just a product? | 6 |
| | b | Explain Data warehouse life cycle approach and development phases | 6 |

OR

| Q 1. | a | Explain types of meta data with respect to functional areas. | 6 |
| | b | Explain the use of neural networks in data mining. | 6 |

| Q 2. | a | Write short notes on : Rapidly changing dimensions, Aggregate Fact Tables | 6 |
| | b | Explain Web Usage mining with example | 7 |

OR

| Q 2. | a | What is data loading? What are its types? How is it applied to the DW? | 6 |
| | b | Explain Time Series Analysis | 7 |

| Q 3. | a | Distinguish between ROLAP vs MOLAP | 6 |
| | b | Write a short note on Data Mining Applications. | 7 |

OR

| Q3. | a | Write a short note on Pilot project. | 6 |
| | b | Explain the concept of boxplots. | 7 |

SECTION – II

| Q 4. | a | Explain constraints on Specialization and Generalization | 6 |
| | b | Explain Aggregation with respect to Extended ER model | 6 |

OR

| Q 4. | a | Write short note on Complex Objects in Object Oriented Model. | 6 |
| | b | Explain Type Hierarchy and Inheritance with respect to Object Oriented Model. | 6 |

| Q 5. | a | Write short notes on method caching and pointer swizzling. | 6 |
| | b | Give a comparison of RDBMS, OODBMS and ORDBMS | 6 |

OR

| Q 5. | a | Explain types of Data Fragmentation and Replication | 6 |
| | b | Explain Client Server Architecture with respect to Distributed Databases. | 6 |

| Q 6. | a | Explain XML Schema in detail. | 6 |
| | b | Write short note on XSLT and XQUERY | 7 |

OR

| Q6. | a | Explain Deductive Databases. | 6 |
| | b | Explain how Indexing is done for Text data bases. | 7 |

WT-Con. 1757-16.

QP Code : 18566

(3 Hours)

[Total Marks: 75]

N.B.
1. All questions are compulsory.
2. Answers to the two sections must be written in the same answer books and should be submitted together.
3. Write answers to same question together.

SECTION – I

Q 1. a Explain the working of human eye.   6
       b What is image processing? Explain all the steps.   6

OR

Q 1. a Explain brightness adaptation and discrimination.   6
       b Explain sharpening filters in detail.   6

Q 2. a Define Hadamard transform. Find the Hadamard transform of (1,0,1,0,0,1,1,0)   6
       b What is Laplacian of Gaussian filter (LOG)? Explain in detail.   7

OR

Q 2. a Write a short note on Karhunen - Loeve (Hotelling) transform.   6
       b What is Frequency domain? Explain its use in Image processing.   7

Q 3. a Explain Hit-or-Miss transformation.   6
       b What are the different approaches for describing image regions? Explain any one. 7

OR

Q3.   a What is thresholding? Write the algorithm to obtain the single global threshold 6
          automatically.
       b State and explain any three applications of gray-scale morphology.   7

SECTION – II

Q 4. a Write a short note on vowels.   6
       b Describe the k –means clustering algorithm.   6

OR

Q 4. a Explain the pattern recognition approach for speech recognition.   6
       b Write a short note on Coin toss model.   6

Q 5. a Discuss the advantages and disadvantages of vector quantization.   6
       b Discuss the advantage of using IIR and FIR filter design for a filter bank.   6
                                    OR
Q 5. a What is distortion measure? What are the mathematical properties it should follow? 6
       b Explain the working of human ear.   6

Q 6. a List the characteristics of Speech Recognition applications.   6
       b Write a short note on directory listing retrieval   7
                                    OR
Q6.   a Explain a task specific voice control and dialog system with the help of block   6
          diagram.
       b List the advantages and disadvantages of using whole word models.   7

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WT-Con. 1733-16.