

M.Sc (IT) (Part-I)
Computer Simulation & Modeling & Programming with Components
(OCT-16)

QP Code : 75498

(3 Hours)

Total Marks: 75

- N.B: (1) All questions are compulsory.
(2) Answers to the two sections must be written in same answer book and should be submitted together
(3) Write answers to same questions together
(4) Mixing of sub-questions is not allowed.

SECTION – I

- Q.1 (A) Briefly explain various components of the system. 6
(B) Explain Types of Model in Simulation. 7

OR

- Q.1 (A) Explain when simulation is the Inappropriate tool. 6
(B) Explain the following terms. 7
(i) System (ii) Entity (iii) Activity (iv) System state (v) Model (vi) Attribute.

- Q.2 (A) Explain the concept of Discrete Event Simulation. 6
(B) The director of finance for a farm co-operative concerned about the 7
yield per acre she can expect from this year's corn crop. The
probability distribution of the yield for the current Weather conditions
is given below:

Yield(in Kgs/acre) : 120 140 160 180

Probability : 0.18 0.26 0.44 0.12

She is also interested in the effect of market price fluctuations on the
co-op. farms Revenue = Yield x Price. She makes the estimate of per
Kg. prices of corn as follows:

Price (in Rs. / Kg.) : 12 13 14 15 16 17

Probability : 0.05 0.15 0.3 0.25 0.15 0.1

Assuming that prices are independent of yields, combine these two in
to revenue /acre for next ten years. Also find the average revenue/acre
she might expect every year.

Random Numbers:

For Yield: 20 72 34 54 30 22 48 74 76 02

For Price: 82 95 18 96 20 84 56 11 52 03

OR

- Q.2 (A) What are characteristics of queuing system? 6
(B) A computer terminal retail person is "beeped" each die there is cell for 7
service, the no. of base per hour is known to occur in accordance with
a Poisson's distribution with a mean of $\lambda = 2$ per hour.
1) Find the probability of 3 beeps in the next hour.
2) determine the probability of 2 or more beeps in 1 hour period.

- Q.3 (A) What do you understand by model verification and validation? 6
(B) Records pertaining to monthly number of job related injuries at 6
chemical Plant were being studied by an NGO. The value for the past
100 as follows: —

Injuries per month	1	2	3	4	5	6	7	8	9	10
Frequency of Occurrence	20	15	03	08	10	04	10	09	16	05

Apply the chi-square goodness of fit test to these data to test the hypothesis that the distribution is Poisson.

OR

- Q.3 (A) Explain the following Terms. 6
 i) Gap Test.
 ii) Autocorrelation Test.

- (B) Consider the sequence of 40 numbers 6

0.52	0.99	0.46	0.58	0.64	0.25	0.88	0.11	0.20	0.18
0.97	0.44	0.43	0.94	0.82	0.60	0.73	0.69	0.21	0.03
0.04	0.81	0.85	0.30	0.47	0.96	0.17	0.72	0.62	0.27
0.10	0.60	0.34	0.65	0.79	0.44	0.02	0.37	0.48	0.50

Determine whether the hypothesis of independence can be rejected based on runs above and below the mean. where $\alpha = 0.05$ and mean = 0.495.

SECTION – II

- Q.4 (A) Why there is need to distribute centralize object? Explain the advantage of distributed system. 6

- (B) Explain in short the comparison of COM with OLE. 7

OR

- Q.4 (A) What is distributed object system? Explain the evaluation of distributed object system. 6

- (B) "COM is better than C++ distribution", Justify 7

- Q.5 (A) Write short note on (i) DCOM. (ii) Interface Definition Language (IDL). 6

- (B) What is class emulation? Explain how it is handle? 6

OR

- Q.5 (A) What is marshalling? Explain in brief about standard marshalling. 6

- (B) Explain (i) Cross-Apartment. (ii) Life Cycle Management. 6

- Q.6 (A) Explain Java Native Interface(JNI) with steps for creating JNI method. 6

- (B) State and explain different types of CORBA services. 6

OR

- Q.6 (A) Explain Enterprise JAVA Bean with its application. 6

- (B) What are web technologies interfacing with distributed objects over client server? 6

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M.Sc (IT) (Part-I)
Mobile Computing &
Advanced Computer Networks
(OCT-16)

QP Code : 75553

(3 Hours)

[Total Marks : 75

N.B: (1) All questions are compulsory.

(2) Answers to the two sections must be written in same answer book and should be submitted together

(3) Write answers to same questions together

(4) Mixing of sub-questions is not allowed.

SECTION – I

- Q.1** (A) State and explain the GPRS architecture. 6
(B) Write a short note on WATM. 7
- OR**
- Q.1** (A) Differentiate FDMA and TDMA. 6
(B) Explain the concept of Agent Advertisement and discovery. 7
- Q.2** (A) Explain GEO, LEO, and MEO in satellites systems. 6
(B) What is a HIPERLAN? Explain in detail 7
- OR**
- Q.2** (A) Write a note on Spread Spectrum. 6
(B) What is an antenna? State and explain different types of antennas ? 7
- Q.3** (A) Explain the concept of Near and Far Terminals with suitable example. 6
(B) Write a note on Bluetooth. 6
- OR**
- Q.3** (A) Write a note on Network Security. 6
(B) Write a short note on Mobile databases. 6

SECTION – II

- Q.4** (A) List out similarities and dissimilarities between CSU and DSU. 6
(B) Write short note on (any two): 7
 a. Wireless LAN
 b. Hub and Spoke topology
 c. OSI Model
- OR**
- Q.4** (A) Describe the role of PVC and SVC in frame relay. 6
(B) State the advantages and disadvantages of xDSL over legacy dial access. 7
- Q.5** (A) Explain with neat diagram the architecture of ISDN Protocol model for network communication. 6
(B) Explain Spanning Tree Protocol. 6
- OR**
- Q.5** (A) With neat diagram explain FDDI token-passing routine. Explain with example how FDDI is having a capability of self-healing. 6
(B) Explain Wavelength Division Multiplexing. 6
- Q.6** (A) Describe the SDH (Synchronous Digital Hierarchy) frame format. 6
(B) Explain the function of link level in X.25 model. 6

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OR

- Q.6 (A) Explain the protocols used in transport layer of TCP/IP protocol suite. 6
(B) List and explain any six business and technical requirements and challenges. 6

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M.Sc (IT) (Part-I)
***Image Processing &
Speech Recognition***
(OCT-16)

(3 Hours)

QP Code : 75607

Total Marks:75

N.B: (1) All questions are compulsory.

(2) Answers to the two sections must be written in same answer book and should be

submitted together

(3) Write answers to same questions together

(4) Mixing of sub-questions is not allowed.

SECTION – I

- Q.1** (A) Explain brightness adaptation and discrimination in detail. 6
(B) Briefly describe the fundamental steps in Digital Image Processing 7

OR

- Q.1** (A) Write a short note on image formation model. 6
(B) Define different types of adjacency & explain how m - adjacency is different from 8 - adjacency with an example. 7

- Q.2** (A) Explain: i) Contrast stretching ii) Gray level slicing 6
iii) Bit plane slicing.
(B) Write short note on image Thresholding. 7
Obtain the Threshold image for the 3 Bit image shown below:
Where threshold = 4.

7	3	2
4	7	4
2	3	7

OR

- Q.2** (A) Explain high boost filtering. Give two differences between 6
smoothing filters and sharpening filters.
(B) With the help of a neat figure, explain the main elements of the 7
human eye.
- Q.3** (A) What are wavelets? How it is better than DFT? 6
Describe the use of wavelets in image processing.
(B) Explain the opening and closing morphological image processing 6
operations.

OR

- Q.3** (A) State and explain the three types of data redundancies in Digital 6
Image Compression.
(B) Define Segmentation. Explain point and edge detection. 6

SECTION – II

- Q.4** (A) Define the following terms: 6
i. Signal Processing
ii. Acoustics
iii. Linguistics
(B) Describe the three-state (silence, voiced, unvoiced) representation 7
of speech in the time and frequency domains.

OR

- Q.4** (A) Explain with block diagram of a task-specific voice control and 6
dialog system.

- (B) Why speech endpoint detection is difficult? List the methods proposed for speech detection (end points). 7
- Q.5 (A) Describe Bank-of-filters analysis model with diagram. 6
 (B) What is Hidden Markov Model? Give its some application. 6
- OR**
- Q.5 (A) A speech signal is sampled at a rate of 20000 samples per second ($F_s = 20$ KHz). A 20-msec window is used for short-time spectral analysis, and the window is moved by 10 msec in consecutive analysis frames. Assume that a radix-2 FFT is used to compute DFT.
 1. How many speech samples are used in each segment?
 2. What is the frame rate of the short-time spectral analysis? 6
 (B) Explain the pattern recognition approach for speech recognition. 6
- Q.6 (A) Describe the process of acoustic-phonetic speech recognition system with block diagram. 6
 (B) Write advantages and disadvantages of source coding technique. 6
- OR**
- Q.6 (A) Explain the speech production and perception mechanism in human being. 6
 (B) Write a short note on directory listing retrieval system. 6

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M.Sc (IT) (Part-I)
Data Warehousing & Mining &
Advanced Database System
(OCT-16)

QP Code : 75661

(3 Hours)

Total Marks:75

N.B: (1) All questions are compulsory.

(2) Answers to the two sections must be written in same answer book and should be submitted together

(3) Write answers to same questions together

(4) Mixing of sub-questions is not allowed.

SECTION - I

- Q.1 (A) What are the components of a Data Warehouse? 6
(B) Explain the Knowledge Discovery in Databases Process. 7
OR
- Q.1 (A) Explain 'Interview' as requirement gathering technique. 6
(B) Explain the concept of Artificial Neural Networks in data mining. 7
- Q.2 (A) Explain the data design phase of a Data Warehouse. 6
(B) Explain Web Usage mining with example. 7
OR
- Q.2 (A) Explain in detail the concept of Information Package along with suitable example. 6
(B) Explain Time Series Analysis. 7
- Q.3 (A) Explain OLAP models in detail. 6
(B) What are the recent trends in data mining? 6
OR
- Q.3 (A) What is indexing? Why is it needed in a Data Warehouse? Explain the different indexing techniques. 6
(B) Explain Spatial Data Structures. 6

SECTION – II

- Q.4 (A) Explain constraints on Specialization & Generalization. 6
(B) Explain in detail the constraints on Relationship. 7
OR
- Q.4 (A) Explain the concept of Hierarchies and Lattices 6
(B) Write short note on Object Identity in Object Oriented Model. 7
- Q.5 (A) Give a comparison of RDBMS, OODBMS & ORDBMS 6
(B) Explain the concept of Versions & Configurations. 6
OR
- Q.5 (A) Explain types of Data Fragmentation & Replication 6
(B) Write a short note on Distributed Concurrency Control. 6
- Q.6 (A) Explain XML Schema in detail 6
(B) Write short note on XPATH & XQUERY 6
OR
- Q.6 (A) Write short note on GIS. 6
(B) Write short note on Deductive Databases 6

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