

M.SC. {I.T.} (PART-I)
COMPUTER SIMULATION & MODELING,
PROGRAMMING WITH COMPONENTS
PAPER - I (JAN- 2020)

(3 Hours)

[Total Marks: 75]

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 Define Simulation. State the different types of application in simulation. **6**
 b State the advantages and disadvantages of Simulations. **6**

OR

- Q 1. a Explain discrete random variable with an example. **6**
 b Describe the types of models in simulation. **6**

- Q 2. a Describe event-scheduling simulation. **6**
 b Write the properties of Poisson Distribution. **7**

OR

- Q 2. a Explain any two discrete distributions and give the equation of probability mass function. **6**
 b The number of cyclones hitting the coast of Odisha is a Poisson Distribution with a mean of 0.5. What is the probability that more than 2 cyclones will hit the Odisha coast in a year. **7**

- Q 3. a Explain the goodness of fit test with examples. **6**
 b What do you understand by model verification and validation? **7**

OR

- Q3. a Explain data collection for input modeling. **6**
 b Explain the following Terms. **7**
 i) Gap Test.
 ii) Autocorrelation Test.

SECTION – II

- Q 4. a Explain 2-Tier and Multitier Architecture System. 6
b Write the application of COM technology. 6

OR

- Q 4. a Write the features of Object Oriented Programming Languages. 6
b Describe COM Interface Definition Language(IDL). 6

- Q 5. a Define CORBA. Explain its services. 6
b Explain : 1) Cross Apartment 2) Life cycle management 6

OR

- Q 5. a What is the role of stub and skeleton in CORBA architecture? 6
b Justify : Is it better if we separate interface and COM implementation. 6

- Q 6. a Explain the steps used in the creation of Java Native Interface (JNI). 6
b Describe the architecture of Enterprise Java Beans(EJB). 7

OR

- Q6. a Explain dynamic linking with an example. 6
b What is meant by Object Activation? Explain In-process and Out-process activation. 7

M.SC. {I.T.} (PART-I)
MOBILE COMPUTING, ADVANCED
COMPUTER NETWORKS
PAPER – II (JAN- 2020)

(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 in detail services offered by GSM architecture. | 6 |
| | b | Differentiate among GEO, MEO and LEO. | 6 |

OR

- | | | | |
|------|---|--|---|
| Q 1. | a | Explain in detail minimum shift keying with example | 6 |
| | b | Explain CDMA and FDMA. | 6 |
| Q 2. | a | What is the basic purpose of DHCP? How DHCP can be used for mobility and support of the mobile IP? | 6 |
| | b | What are the different types of satellite orbits? Explain any one in brief. | 7 |

OR

- | | | | |
|------|---|--|---|
| Q 2. | a | Explain Digital Video Broadcasting and state its applications. | 6 |
| | b | What is WML? Explain WML script. | 7 |
| Q 3. | a | Explain Mobile Devices Network Security. | 6 |
| | b | Write note on Switched Multi Megabit Data Service. | 7 |

OR

- | | | | |
|-----|---|--|---|
| Q3. | a | Explain client initialization using dynamic host configuration protocol. | 6 |
| | b | Write short note on a) Bluetooth b) Mobile IP | 7 |

SECTION – II

- Q 4. a Write short note on Switches and Routers. 6
b Describe SONET/SDH standards in optical networking. 6

OR

- Q 4. a Explain Dense Wavelength Division Multiplexing (DWDM) with the help of diagram. 6
b Write short note on Physical Layer Protocol and Interfaces. 6

- Q 5. a Explain Synchronous Optical Network (SONET) with its advantages. 6
b Explain switched multimegabit data service (SMDS), 6

OR

- Q 5. a State and explain transmission media in brief. 6
b What is Frame Relay? State the advantages and disadvantages of FR. 6

- Q 6. a What are the High-speed LAN comparison? Explain. 6
b Explain the X.25 protocol in detail. 7

OR

- Q6. a Discuss the business and technical challenges faced by the organizations while setting up a network 6
b Write short note on Packet Switching and Access Network Design. 7

M.SC. {I.T.} (PART-I)

IMAGE PROCESSING, SPEECH RECOGNITION

PAPER - III (JAN- 2020)

(3 Hours)

[Total Marks: 75]

Please check that you have got the correct question paper.

- N. B.: (1) **All** questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculators is **allowed**.
 (7) Answers to the two sections must be written in the same answer books and should be submitted together.

SECTION - I

- Q 1. a Explain the fundamental steps of image processing. **6**
 b With the help of the neat figure, explain the main element of human eye **6**

OR

- Q 1. a Write a short note on sharpening filters. **6**
 b Define different types of adjacency & explain how m - adjacency is different from 8 - adjacency with an example. **6**

- Q 2. a Explain any three properties of 2D Discrete Fourier Transformation. **6**
 b Write note on Histogram Matching, also explain Histogram Equalization. **7**

OR

- Q 2. a Explain high boost filtering. Give two differences between smoothing filters and sharpening filters. **6**
 b What is thresholding? Write the algorithm to obtain the single global Threshold Automatically? **7**

- Q 3. a What are the different approaches for describing image regions? Explain any one. **6**
 b Suppose that a 3-bit image ($L=8$) of size 64×64 pixels ($MN = 4096$) has the intensity distribution shown in following table. Get the histogram equalization transformation function and give the $p_s(s_k)$ for each s_k **7**

Gray level r	0	1	2	3	4	5	6	7
N_k	790	1023	850	656	329	245	122	81

OR

- Q3. a Write a short note on dilation and erosion of an image. **6**
 b What are Wavelets? Describe the use of wavelets in image processing. **7**

SECTION – II

- Q 4. a Explain the speech production and perception in human being. 6
b Explain the interdisciplinary nature of Speech recognition science. 6

OR

- Q 4. a Draw and explain the block diagram of acoustic phonetic speech recognition system. 6
b Describe the process of speech production in human being 6
- Q 5. a Describe the Bank-of-Filters analysis model with diagram 6
b Discuss the advantages and disadvantages of vector quantization. 6

OR

- Q 5. a Explain the following speech classes: Vowels, Nasal consonants, Fricatives. 6
b Describe with diagram the representation of speech in time and frequency domains. 6
- Q 6. a Write a short note on source coding techniques. 6
b Explain the general notation for the connected word-recognition problem. 7

OR

- Q6. a Explain with block diagram of a task-specific voice control and Dialog systems. 6
b Describe the k- means clustering algorithm. 7

M.SC. {I.T.} (PART-I)
DATA WAREHOUSING AND MINING AND
ADVANCED DATABASE SYSTEMS
PAPER - IV (JAN- 2020)

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 What are the characteristics of data warehouse? **6**
b Explain the concept of information package with example. **6**

OR

- Q 1. a Explain types of meta data with respect to functional areas. **6**
b Explain OLAP models in detail. **6**

- Q 2. a What is data loading? What are its types? How is it applied to the DW? **6**
b What is indexing? Why is it needed in a Data Warehouse? Explain the different indexing techniques. **7**

OR

- Q 2. a Explain the data design phase of a Data Warehouse. **6**
b Explain the types & its subtypes of data extraction techniques in details. **7**

- Q 3. a Explain the Web Usage Mining with example. **6**
b Write a short note on Association Rule. **7**

OR

- Q3. a Explain in detail the Knowledge Discovery in Data Process. **6**
b Explain Back Propagation with respect to neural networks. **7**

SECTION – II

- Q 4. a Explain constrains on Specialization & Generalization. 6
b Write short notes on Type Hierarchies & inheritance. 6

OR

- Q 4. a Explain the concept of Hierarchy, Lattice & Category with respect to EER model. 6
b Explain the concept of object persistence. 6

- Q 5. a Explain the different types of fragmentations in a distributed database. 6
b Explain the Nested Relational Model. 6

OR

- Q 5. a Distinguish between RDBMS, OODBMS & ORDBM. 6
b Give an account of Distributed Concurrency Control Based Primary site technique. 6

- Q 6. a Write short note on ECA Model. 6
b Explain the concept of Spatial Databases 7

OR

- Q6. a Define XML. Explain how XML is different from HTML. 6
b Explain the concept of Temporal Databases 7