

M.Sc. (I.T.) Part – I
Computer Simulation & Modelling & Programming with Components
Paper- I
April - 2015

QP Code : 12795

(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 question together.

SECTION – I

- Q. 1 A] Briefly explain various components of the system. 6
 B] If the probability that an individual suffers a bad reaction from certain injection is 0.001. Determine the probability that out of 2000 individuals:- 7
- i) Exactly 5 will suffer a bad reaction
 - ii) More than 4 individuals will suffer a bad reaction
 - iii) Less than 3 individuals will suffer a bad reaction.

OR

- Q. 1 A] Explain the various steps in the event scheduling algorithm. 6
 B] Explain the following terms 7
- i) System b) Entity c) Activity d) System state e) Model f) Attribute

- Q. 2 A] Briefly explain various characteristics of queuing system. 6
 B] A component has an exponential time-to-failure distribution with mean of 10,000 hours:- 7
- i) The component has already been in operation for its mean life. What is the probability that it will fail by 14,000 hours.
 - ii) What is the probability that it will operate for another 5,000 hours after operating for 14,000 hours.

OR

- Q. 2 A] Find the probability that $6 < X < 8$ for each of the following distributions: 6
 i) Uniform ii) Normal iii) Triangular
 B] Using Linear Congruential method generate a sequence of 7 random numbers with $X_0 = 24$, $a = 18$, $c = 44$ and $m = 100$. 7

- Q. 3 A] How to verify simulation model? 6
 B] Explain the measures of performance and their estimation. 6

OR

- Q. 3 A] Describe the inverse transformation technique for Poisson Distribution. 6
 B] How chi-square test is used in testing distributional forms of input data? 6

SECTION – II

- Q. 4 A] Explain the concept of binary composition in COM. 6
 B] What is distributed object system? Explain the evolution of distributed object system. 7

OR

- Q. 4 A] Explain in short the comparison of COM with OLE. 6
 B] What do you mean by object extensibility? Explain with an example. 7

- Q. 5 A] What is Class emulation? Explain how it is handled. 6
 B] Explain the utility of the Query Interface method. 6

OR

- Q. 5 A] What is marshalling? Explain in brief about standard marshalling. 6
 B] Explain the different data types used in COM. Discuss Exception Handling in detail. 6

- Q. 6 A] What is Handle Class? Explain its role and demerits. 6
 B] Explain Interfaces, Implementation and classes in detail. 6

OR

- Q. 6 A] What is object activation? Explain concept of In-process and Out-process activation. 6
 B] Explain the different CORBA services in detail. 6

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SECTION – I

- Q. 1 A] Discuss different types of handover in cellular system. 6
B] Explain the functional Architecture of GSM system. 7
OR
- Q. 1 A] Explain classical aloha and slotted aloha. 6
B] Explain direct sequence spread spectrum with suitable example. 7
- Q. 2 A] Discuss the concept of Hidden and Exposed terminal. How this problem can overcome by multiple access with collision avoidance. 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 Digital audio broadcasting. 6
B] List the advantages and disadvantages of infrared and radio transmission. 7
- Q. 3 A] Explain the advantages and disadvantages of Mobile TCP. 6
B] Why has a scripting language been added to WML? How can this language help saving bandwidth and reducing delay? 6
OR
- Q. 3 A] Explain client initialization using dynamic host configuration protocol. 6
B] Differentiate between IEEE802.11b and IEEE802.11g. 6

SECTION – II

- Q. 4 A] How are standards created? Explain. 6
B] Explain the SONET frame structure. 7
OR
- Q. 4 A] Write notes on i) Routers ii) Modems 6
B] Explain in detail the process of creating standards. 7
- Q. 5 A] Explain the components of Frame Relay. 6
B] State the advantages and disadvantages of xDSL over legacy dial access. 6
OR
- Q. 5 A] Explain any two data-link layer protocols. 6
B] Explain the ISDN functional and reference points. Explain the BRI and PRI service configurations. 6
- Q. 6 A] Explain the X.25 protocol in detail. 6
B] Explain how ATM networks offer Quality of Service to applications. 6
OR
- Q. 6 A] Explain in detail the access network design. 6
B] Discuss the business and technical challenges and requirements faced by the organizations. 6

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M.Sc. (I.T.) Part – I
Image Processing & Speech Recognition
Paper- III
April - 2015

QP Code : 12903

(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 question together.

SECTION – I

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|-----------|----|---|---|
| Q. 1 | A] | Explain in detail brightness adaptation and discrimination? | 6 |
| | B] | Discuss the “Connectivity of Pixels” | 7 |
| OR | | | |
| Q. 1 | A] | Explain in detail Geometric transformation. | 6 |
| | B] | Discuss the steps of image processing. | 7 |
| Q. 2 | A] | What is Laplacian of Gaussian filter (LOG)? Explain in detail. | 6 |
| | B] | Explain the basic steps for filtering in the frequency domain | 7 |
| OR | | | |
| Q. 2 | A] | Write note on Histogram Matching | 6 |
| | B] | Explain Image averaging and Image subtraction | 7 |
| Q. 3 | A] | What is region growing? State the problems encountered in region growing. | 6 |
| | B] | Write a short note on lossy compression techniques. | 6 |
| OR | | | |
| Q. 3 | A] | Explain erosion and dilation of an image. | 6 |
| | B] | Write the applications of morphology | 6 |

SECTION – II

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|-----------|----|---|---|
| Q. 4 | A] | Explain general speech recognition system with block diagram. | 6 |
| | B] | Explain the working of human ear. | 7 |
| OR | | | |
| Q. 4 | A] | Explain the difference in narrowband and wideband spectrogram of signal. | 6 |
| | B] | Explain acoustic phonetic vowel classifier | 7 |
| Q. 5 | A] | Write a short note on end point detection. | 6 |
| | B] | Describe vector quantized based Speech Recognition system. | 6 |
| OR | | | |
| Q. 5 | A] | What is distortion measure? Explain in brief. | 6 |
| | B] | Compare IIR and FIR filters. | 6 |
| Q. 6 | A] | Write a short note on urn and ball model. | 6 |
| | B] | Write note on Automated call type recognition. | 6 |
| OR | | | |
| Q. 6 | A] | Write a short note on coin toss model. | 6 |
| | B] | What are the adverse conditions in Speech recognition? How to deal with them? | 6 |

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SECTION – I

- Q. 1 A] Outline the decision tree algorithm in brief. 6
B] What is association? Explain the apriori candidate generation and test. 7
OR
Q. 1 A] Explain the terms: i) Star schema ii) Snowflake schema 6
B] Explain agglomerative algorithm in brief. 7
Q. 2 A] Explain the different phases of project planning in data warehousing projects. 6
B] How are data warehouse projects different from OLTP system projects? Describe four such differences. 7
OR
Q. 2 A] Write note on Slowly Changing Dimensions. 6
B] What is the relationship between a fuzzy set membership function and classification? Illustrate it with example. 7
Q. 3 A] For information delivery, what is the difference between top-down and bottom-up approaches to data warehouse implementation? 6
B] Define data mining? Explain any two applications of data mining. 6
OR
Q. 3 A] Identify and describe the phases in the KDD differ from data mining. 6
B] What is temporal mining? State its applications. 6

SECTION – II

- Q. 4 A] Explain the following terms: *entity, attribute, attribute value, relationship instance, composite attribute, multivalued attribute* 6
B] Explain object identity, object state and abstract data types. 7
OR
Q. 4 A] State and explain the constraints on specialization and generalization. 6
B] Explain Hierarchies and Lattices with respect to EER diagram 7
Q. 5 A] Explain the layers in 3-tier client-server architectures. 6
B] Compare the primary site method with the primary copy method for distributed concurrency control. How does the use of backup sites affect each? 6
OR
Q. 5 A] What do you mean by data fragmentation? Why is fragmentation useful in distributed database? Explain in brief different types of fragmentation. 6
B] What are the software components in a client server DDBMS? Compare the two-tier and three-tier client server architecture. 6
Q. 6 A] Write a short note on Active Databases. Explain with an example. 6
B] Explain in detail the temporal databases and temporal queries. 6
OR
Q. 6 A] Write short note on Spatial Databases and Deductive databases. 6
B] Explain XML DTDs with example. 6

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