

M.SC. (I.T.) PART-I
Computer Simulation and Modeling,
Programming with Components (P-I)

(JUNE - 2019)

(Time: 3 hours)

[Total Marks: 75]

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.

SECTION – I

1. a. When Simulation is not an appropriate tool? **7**
 b. List the application areas/Industry domains of simulation? **6**

OR

1. a. Explain the terms: (a) entity (b) attribute (c) activity (d) event (e) state in the system simulation context? **7**
 b. Determine the hypothesis of independence for runs above or below the mean for the sequence of 40 numbers given below: **6**

0.41	0.68	0.89	0.94	0.74	0.91	0.55	0.62	0.36	0.27
0.19	0.72	0.75	0.08	0.54	0.02	0.01	0.36	0.16	0.28
0.18	0.01	0.95	0.69	0.18	0.47	0.23	0.32	0.82	0.53
0.31	0.42	0.73	0.04	0.83	0.45	0.13	0.57	0.63	0.29

Also $\alpha=0.05$ $Z_{\alpha}=1.96$ and mean $=0.495$

2. a. The number of cyclones hitting the coast of Odisha has a Poisson distribution with a mean of 0.8. **7**
 i) What is the probability that more than two cyclones will hit the Odisha coast in a year?
 ii) What is the probability that only one cyclone will hit the coast in a year?
 b. Explain any two discrete distributions and give the equation for probability mass function. Also, calculate mean and variance of same. **6**

OR

2. a. What is the inverse transform technique? Explain how it is used for producing random variates for exponential distribution and uniform distribution. **7**
 b. Explain the properties of random number & its consequences. **6**

3. a. Explain goodness of fit test with examples. **6**
 b. State the four steps involved in the development of an input model? **6**

OR

3. a. What are the types of simulations with respect to output analysis? **6**
 b. Describe in detail the three steps approach for model validation? **6**

[TURN OVER]

SECTION I

4. Why COM is better than C++? Justify your answer **7**
 a. What is distributed object system? Explain the evolution of distributed object system **6**
OR
4. What is difference between 2 tier architecture and multi-tier architecture system? **7**
 a. What is COM Interface definition language (IDL)? Explain the syntax for defining COM methods is used in Interface Definition Language (IDL). **6**
5. What is an IUnknown Interface? Explain the three methods of IUnknown Interface **6**
 a. It is better if we separate interface and COM implementation? Why? **6**
OR
5. Explain the COM Activation Model using Service Control Manager(SCM) with the help of a diagram **6**
 a. Write short note on: i) MTA and RTA ii) Cross Apartment. **6**
6. What is a role of stub and skeleton in CORBA architecture? Explain with suitable diagram **6**
 a. What is Java Native Interface (JNI)? Explain the step for creating a java native method with an example **6**
OR
6. What do you mean by Object Web? Explain with example. **6**
 a. What is object activation? Explain the concept of In-process and Out-process activation. **6**

M.SC. (I.T.) PART-I
Mobile Computing, Advanced
Computer Networks (P-II)
(JUNE - 2019)

Time: 3 hours)

[Total Marks: 75]

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 (6) Use of Non-programmable calculators is allowed.

SECTION – I

- | | | |
|----|--|---|
| 1. | | |
| a. | Explain Code Division Multiple Access (CDMA). | 7 |
| b. | Explain Minimum Shift Keying with an example. | 6 |
| | OR | |
| 1. | | |
| a. | What are the different applications of wireless and mobile application? | 7 |
| b. | Explain in detail services offered by GSM architecture. | 6 |
| 2. | | |
| a. | What are the problems of signal propagation? Why do radio waves always follow a straight line? Why their reflection is both useful and harmful? | 7 |
| b. | Explain term multiple access with collision avoidance (MACA). How does it fail in case of hidden/exposed terminals for mobile stations in changing transmission characteristics. | 6 |
| | OR | |
| 2. | | |
| a. | What is the basic purpose of DHCP? How DHCP can be used for mobility and support of the mobile IP? | 7 |
| b. | How TETRA frame is structured? Which are the standards involved in TETRA? | 6 |
| 3. | | |
| a. | What characteristics do the different orbits have? What are their pros and cons? | 6 |
| b. | Name the reasons for the development of wireless ATM. What is one of the main differences in internet technologies from this point of view? Why did wireless ATM not succeed as standalone technology? | 6 |
| | OR | |
| 3. | | |
| a. | Explain in detail Indirect TCP used in mobile transport layer and give its drawbacks. | 6 |
| b. | Explain the wireless transaction protocol. | 6 |

[TURN OVER]

SECTION II

- 4.
 - a. Explain routing and list the advantages of routing. Distinguish between bridges and routers. **7**
 - b. What is the process of creating standards? Explain with the help of diagram. **6**

OR

- 4.
 - a. What do you mean by data communications? Define needs of data communications. List the applications of data communication. **7**
 - b. Explain Open Systems Interconnection Reference Model (OSIRM). **6**
- 5.
 - a. Explain Synchronous Optical Network (SONET) with its advantages. **6**
 - b. State and explain transmission media in brief. **6**

OR

- 5.
 - a. Explain switched multimegabit data service (SMDS). **6**
 - b. Write short note on token bus and token ring. **6**
- 6.
 - a. Explain System Network Architecture (SNA) along with its functions. **6**
 - b. What is packet switching? Compare private versus public networking. **6**

OR

- 6.
 - a. What are the business and technical challenges faced by the organizations while setting up a network? **6**
 - b. Explain ISDN and broadband ISDN in detail. **6**

M.SC. (I.T.) PART-I
Image Processing, Speech
Recognition (P-III)

(JUNE - 2019)

(Time: 3 hours)

[Total Marks: 75]

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SECTION – I

1.
a. Explain in detail about brightness adaptation and discrimination. **7**
b. With the help of a neat figure, explain the main elements of the human eye. **6**
- OR**
1.
a. Explain all the fundamental steps of image processing. **7**
b. Write in detail about the “Connectivity of Pixels”. **6**
2.
a. Explain the significance of LOG filter. Explain why it is used? **7**
b. Explain the Illumination & Reflectance model of the image. **6**
- OR**
2.
a. What are the basic steps needed to perform filtering in frequency domain? **7**
b. Write in detail about Histogram Matching technique. **6**
3.
a. What are the different approaches for describing image regions? Explain any one. **6**
b. Define Segmentation. Explain point and edge detection. **6**
- OR**
3.
a. Explain dilation and erosion of an image. **6**
b. Write short note on Discrete Cosine Transform (DCT). **6**

[TURN OVER]

SECTION II

- 4. a. With help of neat diagram, explain the working of human ear. **7**
- b. Describe voice repertory dialer and automated call type recognition application of speech recognition. **6**

OR

- 4. a. Write in detail about Vowels. **7**
 - b. Explain the difference in narrowband and wideband spectrogram of signal. **6**
- 5. a. Explain acoustic-phonetic vowel classifier. **6**
 - b. Describe the Bank-of-Filters analysis model with diagram. **6**

OR

- 5. a. What is Hidden Markov Model? Give its applications. **6**
 - b. Discuss the advantages and disadvantages of vector quantization. **6**
- 6. a. Write in detail about the Urn and Ball model. **6**
 - b. Explain the characteristics of Speech Recognition applications. **6**

OR

- 6. a. Write advantage and disadvantage of source coding techniques. **6**
- b. Explain the speech production and perception mechanism in human beings. **6**

M.SC. (I.T.) PART-I
Data Warehousing and Mining and
Advanced Database Systems (P-IV)

Time: 3 hours)

(JUNE - 2019)**[Total Marks: 75]**

Please check that you have got the correct question paper.

- N. B.: (1) **All** questions are **compulsory**.
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- (4) Numbers to the **right** indicate **marks**.
- (5) Draw **neat labeled diagrams** wherever **necessary**.
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SECTION – I

- | | | |
|-----------|---|---|
| 1. | | |
| a. | What is meta data and explain its significance? | 7 |
| b. | Explain the Dimensional nature of business data. | 6 |
| OR | | |
| 1. | | |
| a. | Explain the data design phase of a Data warehouse | 7 |
| b. | Explain in detail the concept of Information Package along with suitable example. | 6 |
| 2. | | |
| a. | Explain characteristics of Fact table and dimension table. | 7 |
| b. | Distinguish between ROLAP vs MOLAP | 6 |
| OR | | |
| 2. | | |
| a. | What is a Decision tree? Explain in detail | 7 |
| b. | Define clustering and explain what is meant by unsupervised learning. | 6 |
| 3. | | |
| a. | What is Web Mining? | 6 |
| b. | Data generalization and summarization based characterization | 6 |
| OR | | |
| 3. | | |
| a. | Define the following : a. Mean b. Median c. Mode | 6 |
| b. | Explain the concept of Genetic algorithms in detail | 6 |

[TURN OVER]

SECTION II

- 4.
 - a. Explain characteristics of Specialization and Generalization. **7**
 - b. Explain the concept of weak entity sets. **6**

OR
- 4.
 - a. Explain the concept of versions & configurations. **7**
 - b. Write short note on the concept of complex objects. **6**
- 5.
 - a. Compare of OODBMS, RDBMS, ORDBMS. **6**
 - b. Define Distributed databases. List and explain its types. **6**

OR
- 5.
 - a. Explain the Primary Site method of Distributed Concurrency Control. **6**
 - b. Write short note on Deductive Databases. **6**
- 6.
 - a. Write a short on indexing techniques for text data. **6**
 - b. Explain Semi structured data model and its implementation issues. **6**

OR
- 6.
 - a. Write short note on Mobile Databases and Temporal databases. **6**
 - b. Explain the concept of XML DTD. **6**