

System Modeling and Simulation

QP Code : 19437

(3 hours)

[Total 80 marks]

- N.B: (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** out of remaining **six** questions.
 (3) Assume any **necessary data** but justify the same.
 (4) **Figures to the right** indicate marks.
 (5) Use of **scientific calculator** is **allowed**.

22/05/15

Q.1.

(a) Explain in detail Simulation application in any one of the following system:-

- (i) Vehicles flow analysis at a petrol pump.
 (ii) Passenger flow analysis at railway reservation counter.
 (iii) Customer flow analysis in supermarket.

[10]

(b) Use the Multiplicative Congruential method to generate sequence of five two digit random numbers using $X_0=63$, $a=19$, $m=100$. [5]

(c) A medical examination is given in 3 stages by physician. Each stage is exponentially distributed with a mean service time of 20 minutes. Find the probability that the exam will take 50 minutes or less. Also compute expected length of the exam. [5]

Q.2.

(a) Explain the inverse transform method to generate random variate for exponential distribution. Use it to generate 2 random variate for exponential distribution with parameter $\lambda=2$. Use random numbers 0.30, 0.48 [8]

(b) Draw the flowchart and explain the steps in simulation study. [7]

Q.3.

(a) A paper seller buys the paper for 35 paise each and sells them for 50 paise each. Newspapers that are not sold at the end of the day are sold as scrap for 5 paise each. Newspapers can be purchased in bundles of 10. Thus the newspaper seller can buy 50, 60 & so on. There are 3 types of newspapers: "good", "fair", "poor" with the probability of 0.37, 0.43 and 0.20 respectively. The distribution of papers demanded on each day is as follows. Simulate the above for 5 days and find total the profit from sales, if he purchases 80 papers each day. [8]

Distribution of Newspaper Demanded

Demand	Demand probability distribution		
	Good	Fair	Poor
40	0.03	0.10	0.44
50	0.05	0.18	0.22
60	0.15	0.40	0.16
70	0.20	0.20	0.12
80	0.35	0.08	0.06
90	0.15	0.04	0.00
100	0.07	0.00	0.00

Use the following random numbers.

For Type of Newspaper: 94, 77, 49, 45, 43

For demand : 80, 20, 15, 88, 98

(b) Write a note on verification and validation process. [7]

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Q.4.

(a) Explain the advantages and disadvantages of simulation. [8]

(b) Describe the Poisson process. A mainframe computer crashes in accordance with a Poisson process with a mean rate of one crash every 36 hours. Determine the probability that the next crash will occur between 24 and 48 hours after the last crash.

[7]

Q.5.

(a) Given the following data for utilization for the Able-Baker car hop problem. Calculate the overall point estimators, standard error and 95% confidence intervals for the same.

(Given $t_{0.025,3}=3.18$). [8]

Run :	1	2	3	4
Able's utilization:	0.808	0.875	0.708	0.842

(b) Explain how output analysis is performed for terminating simulations. [7]

Q.6.

(a) Explain in detail "Time Series input models." [8]

(b) Use acceptance rejection techniques to generate three Poisson variates with mean $\alpha=0.2$.

Use following random numbers: [7]

0.4357, 0.4146, 0.8353, 0.9952, 0.8004

Q.7.

(a) Write short note on:-

(i) Goodness of fit test for input analysis. [4]

(ii) Performance parameters of a queuing system. [4]

(b) A set of 100 numbers are to be tested for Uniformity. The observed frequencies in 10 intervals are given below. Use chi-square test to test the hypothesis whether the numbers are uniformly distributed. (Given table value of $\chi_{0.05,9}^2 = 16.9$) [7]

Interval	1	2	3	4	5	6	7	8	9	10
Observed frequency	8	8	10	9	12	8	10	14	10	11

(3 Hours)

[Total Marks : 80

Note:

Question No.1 is Compulsory

Attempt any four Question between Question No.2 to 7

- Q 1. A) Take an example of any two or three e-commerce companies in India providing high end e-commerce solutions and describe how they establish customer confidence, trust and ensured privacy and security of the e-commerce transactions. [10]
- B) What are the steps involved in the system design and system implementation of a computer based information system ? [10]
- Q 2. A) Identify the unique features of e-commerce technology and their business significance [08]
- B) Describe the capabilities of digital Firm. Why are digital firms so powerful? [07]
- Q 3. A) What are the current limitations of online credit card payment systems? [08]
- B) How does spoofing threaten web sites operations? [07]
- Q 4. A) Explain whitely s model in details [08]
- B) What do you mean by mobile computing? Explain how mobile computing can be used to improve business. [07]
- Q 5. A) Mention levels of management of decision support system and explain unstructured level. [08]
- B) Compare traditional Vs Electronic payment system. [07]
- Q 6. Write Short Notes(Any Three) [15]
- a) SSL .
- b) ISP .
- c) EDI .
- d) MIS and CRM systems.
- Q 7. A) Explain most important factors in successful E-commerce site design. [08]
- B) How to test an E-commerce Web-site? [07]

- N.B. (1) Question No. 1 is compulsory.
(2) Attempt any **four** from the remaining six questions.
(3) Illustrate answers with neat sketches wherever required.
(4) Answers to questions should be **grouped** and written **together**.

- Q.1 (a) List and explain General Principles for designing User Interfaces. 10
(b) Design an User Interface (adopting concepts of HCI for designing good interfaces) for a mobile application that guides students through daily college routine, of practical and lectures. The application should help monitor the grades scored in various internal and external examinations and attendance and should display messages to indicate academic health of the student on the basis of performance and attendance. Also provide reports that indicate the efforts to be put by the student to achieve a particular score or grade. Draw the interface(s) and also mention the HCI concepts used by you for designing user friendly and efficient interface. 10
- Q.2 (a) Explain the following Human Characteristics from the point of view of designing interfaces – Visual Acuity, Mental Models and Skill. 8
(b) Explain how User's Tasks and Needs also play an important role in Interface Design from the point of Human Consideration. 7
- Q.3 (a) Explain the following Direct methods for determining requirements during Interface designing –i) Individual face-to-face Interview ii) Card Sorting for Web Sites. 8
(b) What is Mental Model in interface designing? List and explain any six guidelines for designing Conceptual Models. 7
- Q.4 (a) Designing Visually Pleasing Interfaces is important. Explain on the basis of : i) Sequentiality ii) Predictability iii) Regularity iv) Unity 8
(b) What is the purpose of Menus in Interface Design? Explain the following Menu Structures :
i) Sequential Linear Menu ii) Event Trapping Menu iii) Connected Menus 7
- Q.5 (a) Explain the following the types of windows :
i) Primary ii) Dialog Box iii) Message Box iv) Palette 8
(b) List and explain the various Windows presentation styles. 7
- Q.6 (a) List and explain Presentation Controls used during Interface Design. 8
(b) Mention the Guidelines for selecting proper Device-Based Controls. 7
Write note on the following Device-Based Controls –
i) Graphic Tablet ii) Voice
- Q.7 (a) Write note on Contextual Help as a means of providing Guidance and Assistance when designing an Interface. 8
List and explain the possible problems with Colors when designing Interfaces. 7

Advanced Database Theory & Applications

Q.P. Code : 19431

(3 Hours)

[Total Marks : 80

- (1) Question No. 1 is compulsory.
 (2) Attempt any four questions from the remaining six questions.

- Q1 : a) Write short notes on (any three) : 12
 1. Roll-up and Drill-down 2. Phantom Deadlock
 3. Multimedia database 4. Persistent Programming Language
 b) Compare followings (any two) 08
 1. ROLAP and MOLAP
 2. Two Phase and Three Phase Commit
 3. Web Content and Web structure mining
- Q2 : a) Explain OLAP operations on multidimensional cubes with examples. 08
 b) Explain Knowledge Discovery Process (KDD) in detail. What is the role of data mining in the KDD process. 07
- Q3 : a) What are the various complex data types available in Object Relational DBMS ? Explain with suitable examples. 08
 b) Define the terms fragmentation and replication in terms of where data is stored and also how the objects are uniquely identified in distributed database ? 07
- Q4: a) What is Classification technique in Data Mining . Explain K-Nearest Neighbors Algorithm for classification. 08
 b) Explain ORDBMS Implementation challenges in detail 07
- Q5 a) Explain the features of XML and also differentiate between DTD and XML Schema. 08
 b) What is a data warehouse and why it is needed ? Explain ETL process in data warehouse . 07
- Q6 a) Find out the association rules with all possible support and confidence percent from the following sample data: 08

Transactions	Items
T1	Bread, Jelly, Butter
T2	Bread, Butter
T3	Bread, Milk, Butter
T4	Juice, Bread
T5	Juice, Milk

- b) Explain Bitmap index and bitmap join index with example. 07
- Q7 a) Explain K-Means Clustering algorithm in data Mining with a suitable example. 08
 b) Discuss deadlock detection in a distributed database. 07

QP Code : 19428

(3 Hours)

[Total Marks : 80

- N.B. : (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions out of the remaining Q. 2 to Q. 7.
 (3) Answers to **sub question** should be answered **together**.

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|--|----|
| 1. Attempt any four . | 20 |
| (a) What is JDK and JRE ? | |
| (b) Draw the hierarchy of input stream classes. | |
| (c) Custom tags in JSP. | |
| (d) Adapter class. | |
| (e) Differentiate between Struts 1.X versus Struts 2.X | |
| 2. (a) What is database driver ? Which are the types of database drivers ? | 8 |
| (b) Explain the various levels of access protection available for packages & their implications. | 7 |
| 3. (a) What is Cookie class ? Which are the methods of Cookie class ? Explain with the help of example. | 8 |
| (b) Explain JSP architecture with neat diagram. | 7 |
| 4. (a) What is EJB ? Explain the types of EJB. | 8 |
| (b) What is Struts ? Explain Struts architecture. | 7 |
| 5. (a) List the Java API packages. Write a program to create "online education" package containing various related classes or interface as Branch, Subject, Text, Result etc. Each class or interface will contain methods to handle its task. | 8 |
| (b) Explain Event delegation model. | 7 |
| 6. (a) How do we achieve session tracking in servlet ? | 8 |
| (b) Define an exception called " No Match Exception" that is thrown when a string is not equal to "Mumbai". Write a program that uses this exception. | 7 |
| 7. (a) What is XML ? Explain structure of XML DTD. | 8 |
| (b) What is multithreading environment ? Explain thread synchronization in detail. | 7 |

Instructions to the candidates:-

- (i) **Question No 1 is compulsory.**
- (ii) **Answer any four (4) of the remaining six (6) questions.**
- (iii) **Answers to the questions should be grouped and written together.**
- (iv) **Figures on the right indicate full marks assigned to the question.**
- (v) **Do not reveal your identity in the letters and reports**

Q1. Summarise the following passage to one third of its original length.

(a) Communication has always been the backbone of any industry. Any information when not communicated properly can be misconstrued, leading to a lot of difficulties for an organization. To avoid this, firms today are coming up with various methods of communication to keep their employees well informed. There are three methods of communication within an organization. Functional communication that ensures operations. Motivational communication that updates employees about the firm's challenges or tasks and developmental communication through training or sharing of information.

There should be an open flow of information from the top to the bottom and vice versa in an organization. This ensures that important information flows across the organization and also helps the employees understand the big picture. 'Bottom-up' communication helps the management to stay connected with the employees and be proactive in their management style.

So, how does official information travel from top management to the bottom? It follows both formal and informal ways which are equally important. The management resorts to either form within the organization. Some firms have adopted unique methods using new age methods like 'live chat' where the management functionaries log in open chat forums and answer and interact with personnel dispersed at various locations. Another mode of communication is the use of 'Notice Boards' to disseminate information. Workshops are held to educate the staff on new processes / latest developments in the field. CDs, posters, Newsletters and town halls (which is publicly addressing a large group of people), electronic newsletters and emails are some of the modes of communication. The companies use electronic newsletters, emails etc to forward messages from the management to welcome new staff or congratulate some achievement of someone. Some find that face to face town-hall is the most effective means of communication as one question asked by an employee could also be a doubt in the minds of many. Face to face communication they feel builds credulity.

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With the changing times, newer means of communication are springing up each day. So what should be the modus operandi of the companies? As organizations are expanding and have multiple locations and numerous employees it is imperative that employees are kept well informed, extensively through the organization. Internal communication should be timely and credible. Employees should hear it from inside the company before they read it in the news. This calls for two aspects, top management in communication and a motivated network that picks and transmits news as it happens anywhere in the company.

(Total 411 words)

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|-----|--|----|
| | | 10 |
| | (b) Explain the role of Attitude in determining organisational climate. | 10 |
| Q2. | (a) What are the characteristics of a good report?. | 8 |
| | (b) How can a manager utilise grape vine to his advantage? | 7 |
| Q3. | (a) Group Discussion is a leaderless exercise . Elaborate the statement. | 8 |
| | (b) Discuss the basic rules of conduct during a Personal Interview. | 7 |
| Q4. | (a) Explain Five Stage Model of Group Development. | 8 |
| | (b) Explain Stress Management with respect to an organisation. | 7 |
| Q5 | (a) Suggest ways of overcoming sociological barriers of communication. | 8 |
| | (b) How can written communication be made effective. | 7 |

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QP Code : 19434

Q6 (a) Write an application in response to the following advertisement in the Deccan Chronicle dated 15 Mar 2015.

Applications are invited for the post of Software Testing Executive at our Bangalore office. The candidate must have Masters Degree in Computers with relevant experience of 5 years. A dynamic professional with excellent communication will be preferred. The applications should be addressed to The Manager Personnel, Wipro Informatics, Bangalore 560 001.

8

(b) Write a resume for the above post.

7

Q7 Write short notes on any three:-

(a) Netiquette.

(b) Use of posters ,signs and signals in communication

(c) Ethical aspects of communication.

(d) Negotiation skills.

15
