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10CS82

Eighth Semester B.E. Degree Examination, June/July 2016
System Modeling and Simulation

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. With a neat flow chart, explain various steps in a simulation study. **(10 Marks)**

b. Briefly explain the advantages and disadvantages of simulation. **(10 Marks)**

2 a. A computer technical support center is staffed by two people, Able and Baker, who take calls and try to answer questions and solve computer problems. The time between calls ranges from 1 to 4 minutes with the distribution as shown in Table 1.1. Able is more experienced and can provide service faster than Baker, which means that, when both are idle, Able takes the call. The distribution of their service times are shown in Table 1.2 and Table 1.3 respectively.

Table 1.1: Inter arrival time (IAT) distribution

IAT (mins)	1	2	3	4
Probability	0.25	0.40	0.20	0.15

Table 1.2: Service time distribution of Able

Service time (mins)	2	3	4	5
Probability	0.30	0.28	0.25	0.17

Table 1.3: Service time distribution of Baker

Service time (mins)	3	4	5	6
Probability	0.35	0.25	0.20	0.2

Random digits for inter-arrival times are : 26, 98, 90, 26, 42, 74, 80, 68, 22, 48, 34, 45, 24, 34.
Random digits for service time are : 95, 21, 51, 92, 89, 38, 13, 61, 50, 49, 39, 53, 88, 01, 81.
Simulate this system for 10 customers, by finding

i) Average waiting time for a customer
ii) Average Inter Arrival time
iii) Average service time of Able
iv) Average service time of Baker
v) Average waiting time of those who wait. **(12 Marks)**

b. Explain the various concepts used in discrete-event simulation with an example. **(08 Marks)**

3 a. Explain simulation in Java. **(06 Marks)**

b. A company used 6 trucks to haul manganese from Kolar to industry. There are two loaders, to load each truck. After loading, a truck moves to the weighing scale to be weighed. The queue discipline is FIFO. When it is weighed, a truck travels to the industry and returns to the loader queue. The distribution of loading time, weighing time and travel time are as follows :

Loading Time (mins)	10	5	5	10	15	10	10	15
Weighing Time (mins)	8	12	8	16	12	8		
Travel Time (mins)	30	60	80	40	50	70		

End of simulation is completion of four weighing from the scale. Calculate the total busy time of both loaders, scale, average loader and scale utilization. Assume that four trucks are at the loaders and Two are at the scale, at time "0". The shopping of simulation is after 10 iterations. **(14 Marks)**

4 a. What is Poisson process? With example explain the properties of Poisson process. **(06 Marks)**
b. Explain the characteristics of a queuing system. **(08 Marks)**
c. Explain the various steady state parameters of M/G/1 Queue. **(06 Marks)**

PART – B

5 a. Use linear congruential method to generate a sequence of 5 random numbers, with given seed 27, increment 43, and constant multiplier 17, modulus 100. **(04 Marks)**
b. The sequence of random numbers 0.54, 0.73, 0.98, 0.11 and 0.68 has been generated. Use K – S test with $\alpha = 0.05$ to determine if the hypothesis that the numbers are uniformly distributed on the interval [0, 1] can be rejected. Take $D\alpha = 0.565$. **(08 Marks)**
c. Test whether the 2^{nd}, 9^{th}, 16^{th} …… Numbers in the following sequence are auto correlated by taking $\alpha = 0.05$. Take $Z_{\alpha/2} = 1.96$.
0.38, 0.48, 0.36, 0.01, 0.54, 0.34, 0.96, 0.06, 0.61, 0.85, 0.48, 0.86, 0.14, 0.86, 0.89, 0.37, 0.49, 0.60, 0.04, 0.83, 0.42, 0.83, 0.37, 0.21, 0.90, 0.89, 0.91, 0.79, 0.77, 0.99, 0.95, 0.27, 0.41, 0.81, 0.96, 0.31, 0.09, 0.06, 0.23, 0.77, 0.73, 0.47, 0.13, 0.55, 0.11, 0.75, 0.36, 0.25, 0.23, 0.72, 0.60, 0.84, 0.70, 0.30, 0.26, 0.38, 0.05, 0.19, 0.73, 0.44. **(08 Marks)**

6 a. Explain acceptance – rejection technique for Poisson distribution. Generate 5 Poisson variates with mean $\alpha = 0.25$. Random numbers are: 0.073, 0.693, 0.945, 0.739, 0.014, 0.342. **(10 Marks)**
b. Test whether the following data follows Poisson distribution using the chi-square test of goodness of fit. With mean $\alpha = 0.05$. Take $\lambda^2_{0.05,5} = 11.1$ **(10 Marks)**

Arrivals /period	0	1	2	3	4	5	6	7	8	9	10	11
Frequency	12	10	19	17	10	8	7	5	5	3	3	1

7 a. Explain the replication method for steady – state simulations. **(10 Marks)**
b. Differentiate between point estimation and interval estimation. **(05 Marks)**
c. Differentiate between terminating and steady state simulations by giving one example each. **(05 Marks)**

8 a. Explain components of verification and validation process. Explain with neat diagram, model building, verification and validation process. **(12 Marks)**
b. With neat diagram, explain the iterative process of calibrating a model. **(08 Marks)**

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10CS/IS834

Eighth Semester B.E. Degree Examination, June/July 2016
Network Management Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain Data and Telecommunication Networks with neat diagrams. **(10 Marks)**
b. Briefly explain Network Management functional groupings with neat diagrams. **(10 Marks)**

2 a. What are network management standards? Explain. **(06 Marks)**
b. Briefly explain models in OSI Network management architecture model with a necessary diagram. **(08 Marks)**
c. Explain Information model with a neat diagram. **(06 Marks)**

3 a. Explain SNMP organization model with neat diagram. **(10 Marks)**
b. Explain the system overview of SNMP network management architecture with neat diagram. **(10 Marks)**

4 a. Explain the SNMP based ASN.1 data type structure with a necessary diagram. **(10 Marks)**
b. Explain the encoding structure used in SNMPv1. **(05 Marks)**
c. Explain the structure of Managed objects. **(05 Marks)**

PART – B

5 a. What is Remote monitoring (RMON)? Explain the advantages of using Remote monitoring with a necessary diagram. **(10 Marks)**
b. Explain various groups and functions RMON1 performs at the data link layer. **(10 Marks)**

6 a. With a neat sketch explain :
i) Layered architecture of LAN emulation across ATM
ii) LAN emulation client connections across LUNI **(10 Marks)**
b. Explain with neat sketches :
i) ATM network reference model
ii) M2 interface. **(10 Marks)**

7 a. Explain with neat sketches Broadband access technology and HFC Technology. **(10 Marks)**
b. Explain the protocol layer architecture in an HFC system. **(05 Marks)**
c. What are ADSL network management elements? Discuss ADSL fault management. **(05 Marks)**

8 a. What are event correlation techniques? List the approaches. Explain rule based reasoning with neat sketches. **(10 Marks)**
b. Explain client/server Authentication system. **(10 Marks)**

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10CS/IS835

Eighth Semester B.E. Degree Examination, June/July 2016
Information and Network Security

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Briefly explain the components of issue specific security policy. **(08 Marks)**
b. Discuss various stages in a Incident response planning strategy. **(08 Marks)**
c. Write and define different levels of controls in a security Architecture. **(04 Marks)**

2 a. Explain different categories of Firewalls according to their processing mode. **(10 Marks)**
b. Define any six design rules of Firewall. **(06 Marks)**
c. Discuss content filter technology in a security. **(04 Marks)**

3 a. Explain Host based intrusion detection system. Write its advantages and disadvantages. **(08 Marks)**
b. Discuss port scanning and Vulnerability scanning tools. **(08 Marks)**
c. Define the following terms with respect to intrusion detection system:
i) Alert ii) False positive iii) False negative iv) Confidence value. **(04 Marks)**

4 a. Describe any four attacks on a cryptosystem. **(08 Marks)**
b. Explain substitution cipher technique. Discuss its weakness. **(08 Marks)**
c. Define the following terms with respect to cryptography:
i) Encryption ii) Cipher iii) Keyspace iv) Strganography. **(04 Marks)**

PART – B

5 a. Write and explain the general format of a X.509 public key certificate. **(08 Marks)**
b. List the difference between Kerberos version 4 and version 5. **(06 Marks)**
c. Explain any Three Active security attacks. **(06 Marks)**

6 a. Explain the PGP message generation and message reception technique. **(10 Marks)**
b. Briefly explain the header fields of MIME protocol. **(05 Marks)**
c. What is S/MIME? What are the functions of S/SMIME? **(05 Marks)**

7 a. Describe the SA parameters and SA selectors of a IPSec. **(10 Marks)**
b. Draw and explain the header format of ESP protocol. **(06 Marks)**
c. Mention the applications of IPSec. **(04 Marks)**

8 a. Explain different phases in a SSL Handshake protocol. **(10 Marks)**
b. Define the key features of SET protocol. **(04 Marks)**
c. Discuss the need and construction of a Dual-signature in a SET protocol. **(06 Marks)**

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10CS/IS841

Eighth Semester B.E. Degree Examination, June/July 2016
Ad-Hoc Networks

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Write any eight differences between cellular networks and Ad-hoc wireless networks. **(10 Marks)**

b. Explain the major issues to be considered in designing a MAC protocol for Ad-hoc wireless networks. **(10 Marks)**

2 a. Explain hidden and exposed terminal problems with a neat diagram. **(05 Marks)**

b. Explain the packet exchange mechanism in MACAW protocol with a neat diagram. **(06 Marks)**

c. Explain collision avoidance time allocation protocol frame format with a diagram. **(09 Marks)**

3 a. Explain MAC protocol using directional antennas. **(06 Marks)**

b. Explain interleaved carrier–sense multiple access protocol in brief. **(07 Marks)**

c. Explain the operation of multichannel MAC protocol with a neat diagram. **(07 Marks)**

4 a. Write the classification of routing protocol based on the routing information update mechanism. **(03 Marks)**

b. Explain DSDV routing protocol with an example. **(09 Marks)**

c. Explain AODV protocol. **(08 Marks)**

PART – B

5 a. Explain zone routing protocol. **(07 Marks)**

b. Explain Fishey state routing protocol with an example. **(13 Marks)**

6 a. Why does TCP not perform well in Ad-hoc wireless networks? **(10 Marks)**

b. Explain Ad-hoc TCP, with state diagram for ATCP sender. **(10 Marks)**

7 a. Explain in brief various routing attacks. **(05 Marks)**

b. Briefly explain requirements for a secure routing protocol. **(04 Marks)**

c. Explain two major kinds cryptographic algorithms. **(11 Marks)**

8 a. Briefly explain the characteristics that affects QoS provisioning in Ad-hoc wireless networks. **(07 Marks)**

b. Explain Location and delay predictions with respect to predictive location based QoS routing protocol. **(13 Marks)**

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10CS842

Eighth Semester B.E. Degree Examination, June/July 2016
Software Testing

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. With a neat diagram of a testing life cycle explain following :
i) Fault ii) Failure iii) Incident iv) Test case **(10 Marks)**

b. With a neat sketch, explain the features of 'The SATM' system. **(10 Marks)**

2 a. Explain the following :
i) Robustness testing ii) Worst – case testing. **(08 Marks)**

b. Describe the equivalence class test cases for 'The triangle problem'. **(12 Marks)**

3 a. Define the program graph. Write a structured triangle program and the program graph. **(10 Marks)**

b. For the program graph G(P) and a set of program variable, define the terms 'Defining node of a variable', 'Definition use path with respect to a variable 'All-Defs criterion', 'All C-uses/some p-used and 'All du-paths criterion'. **(10 Marks)**

4 a. Briefly explain the specification – based life – cycle models in levels of testing. **(10 Marks)**

b. What is decomposition based integration? Define the different types of decomposition based integration. **(10 Marks)**

PART – B

5 a. Briefly explain the basic concepts for requirements specification in system testing. **(10 Marks)**

b. Write a short note on: 'taxonomy of interactions' and 'Client/ Server testing'. **(10 Marks)**

6 a. List and explain any four principles that characterize various approaches and techniques for analysis and testing. **(10 Marks)**

b. Explain how does the goals of quality process improvement can be accomplished for analysis and testing of a software. **(10 Marks)**

7 a. What is fault – based testing? Define the terminologies 'Program location' and 'Alternate expression'. **(06 Marks)**

b. Define scaffolding? Mention the purposes of scaffolding. **(04 Marks)**

c. What is a test oracle? With a neat diagram explain the comparison based test oracle. **(10 Marks)**

8 a. Discuss the risks generic to process management and risks specific to quality management with a suitable example. **(10 Marks)**

b. Discuss the basic elements of analysis and test plan. **(10 Marks)**

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