Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Software Architecture

Time: 3 hrs.

Max. Marks:100

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

PART – A

1 a. Define software architecture. What is a architecture business cycle? Explain with a neat diagram. **(08 Marks)**
   b. Explain the various process recommendations as used by an architect while developing software architectures. **(06 Marks)**
   c. Define architectural model, reference model, reference architecture and bring out the relationship between them. **(06 Marks)**

2 a. Explain the process control paradigm with various process control definitions. **(08 Marks)**
   b. What are the basic requirements for a mobile robot's architecture? How the implicit invocation model handles them? **(08 Marks)**
   c. Write a note on heterogeneous architectures. **(04 Marks)**

3 a. Briefly explain the testability tactics. **(07 Marks)**
   b. What are the qualities of the system? Explain the modifiability general scenario. **(07 Marks)**
   c. Explain how faults are detected and prevented, using availability tactics. **(06 Marks)**

4 a. List and explain the benefits and liabilities of pipes and filters pattern. **(08 Marks)**
   b. Define architectural pattern for blackboard. Briefly explain the steps to implement the blackboard architectural pattern. **(08 Marks)**
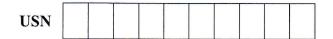   c. Write a short note on HEARSAY – II system. **(04 Marks)**

PART – B

5 a. What do you mean by broker architecture? What are the steps involved in implementing distributed broker architecture patterns. **(08 Marks)**
   b. Give the CRC cards for top level, intermediate level and bottom level PAC-agents. Highlight the limitations of PAC pattern. **(08 Marks)**
   c. Depict the dynamic behavior of MVC, with any one scenario. **(04 Marks)**

6 a. Discuss the benefits and liabilities of reflection architectural pattern and also highlight the known uses of reflection architectural pattern. **(07 Marks)**
   b. Explain in brief, the components comprising the structure of microkernel architectural pattern with OMT (Object Modeling Technique) diagram. Also draw the CRC cards for each component. **(08 Marks)**
   c. Explain the steps involved in implementing the Microkernel system. **(05 Marks)**

7 a. With a neat sketch, explain the typical dynamic scenario of a proxy structure. Highlight the consequences of proxy structure. **(07 Marks)**
   b. List and explain the steps to implement whole part structure. **(07 Marks)**
   c. Give the structure of master slave design pattern with CRC. And discuss the variants of master slave design pattern. **(06 Marks)**

8 a. Explain with a neat diagram, the evolutionary delivery life cycle model. **(07 Marks)**
   b. Briefly explain the different steps performed while designing an architecture using the ADD method. **(07 Marks)**
   c. Explain the three step procedure for choosing the views for your project. **(06 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
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. What is simulation? State any three merits and demerits. **(05 Marks)**

b. Differentiate between continuous and discrete system. **(05 Marks)**

c. A grocery store has one checkout counter. Customers arrive at this checkout counter at random from 1 to 8 minutes apart and each interval time as the same probability of occurance. The service times vary from 1 to 6 minutes, with probability given below:

Service (minutes)	1	2	3	4	5	6
Probability	0.10	0.20	0.30	0.25	0.10	0.05

Simulate the arrival of six customers and calculate the following:
- (i) Average waiting time for a customer.
- (ii) Probability that a customer has to wait.
- (iii) Probability of a server being Idle.
- (iv) Average service time.
- (v) Average time between arrival.

Use the following sequence of random numbers:
Random digit for arrival : 913, 727, 015, 948, 309, 922
Random digit for service time : 84, 10, 74, 53, 17 **(10 Marks)**

2 a. Briefly define any four concepts used in discrete event simulation. **(04 Marks)**

b. Generating system snapshots at clock = t and clock = H, explain event scheduling algorithm. **(06 Marks)**

c. Suppose the maximum inventory level M is 11 units and the review period N, is 5 days. Estimate by simulation the average ending units in inventory and number of days when a shortage condition occurs. The number of units demanded per day is given by the following distributions. Assume that orders are placed at the close of the business and are received for inventory at the beginning of business as determined by lead time. Initially simulation started with 3 units and order of 8 units scheduled to arrive in 2 days of time.

Demand	0	1	2	3	4
Probability	0.10	0.25	0.35	0.21	0.09

Lead time is a random variable, with the following probability distribution:

Lead time (days)	1	2	3
Probability	0.6	0.3	0.1

Random digits for demand : 24, 35, 65, 81, 54, 03, 87, 27, 73, 70, 47, 45, 48, 17, 09
Random digit for lead time : 5, 0, 3 order quantity 9, 11. Simulate for 3 cycles. **(10 Marks)**

3 a. Differentiate between continuous and uniform distributions. **(10 Marks)**

b. Briefly explain Poission process. **(10 Marks)**

4 a. Explain the characteristics of a queuing system. List different queuing notations. **(10 Marks)**

b. Suppose that the inter arrival times and service times at a single chair unisex-hair-styling shop have been shown to be exponentially distributed the values of X and μ are 2 per hour and 3 per hour respectively that is, the time between arrivals averages ½ hr, exponentially distributed and the service time averages 20 minutes, also exponentially distributed. How server utilization and the probabilities for zero, one, two, three and four or more customers in the shop are computed? **(10 Marks)**

PART – B

5 a. What are pseudo random numbers? What are the problems that occur while generating pseudo random numbers? **(06 Marks)**

b. Generate 6 three digit random numbers using multiplicative congruential method with $X_0 = 117$, a = 43 and M = 1000. **(06 Marks)**

c. Five observations of fire-crew response times to incoming alarms have been collected to be used in a simulation investigating possible alternative staffing and crew scheduling policies. The data are 2.76, 1.83, 0.80, 1.45, 1.24

Develop a preliminary simulation model that uses a response time distribution for five observations. Thus a method for generating random variates from the response time distribution is needed. Initially response time X have a range $0 \le X \le C$. If a random number $R_1 = 0.71$. How it can be represented in graphical view as in Emprical cdf. **(08 Marks)**

6 a. Explain the need for input modeling and histogram method of identifying the input distribution. **(06 Marks)**

b. How chi-square test can be derived from goodness-of-fit test? **(04 Marks)**

c. Briefly explain time-series input models. **(10 Marks)**

7 a. Explain stochastic nature of output data along with measure of performance and their estimation. **(10 Marks)**

b. How the output analysis applied for steady state simulation? Explain any one output analysis. **(10 Marks)**

8 a. How model can be build, perform verification and validation? Explain with diagram. **(10 Marks)**

b. Briefly explain the validation of input out transformation of the model and the various techniques used. **(10 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Information and Network Security

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. Explain the three types of security policies defined in planning security.   (10 Marks)
    b. Describe the major steps involved in contingency planning with neat diagram.   (10 Marks)

2   a. What are firewalls? Explain the processing modes of firewalls.   (06 Marks)
    b. Give the best practices for firewall.   (06 Marks)
    c. How do you protect remote connections? Explain.   (08 Marks)

3   a. List the organizational requirements and constraints involved in designing Intrusion Detection System (IDS)   (06 Marks)
    b. Compare Honey pots, Honey nets and padded cell systems.   (06 Marks)
    c. How to deploy and implement IDS? Explain.   (08 Marks)

4   a. Define Cryptography, Cryptosystems and Cryptanalysis.   (06 Marks)
    b. Compare substitution ciphers with transposition ciphers.   (06 Marks)
    c. Describe any two types of Cryptographic tools.   (08 Marks)

PART – B

5   a. Compare Kerberos version 4.0 with 5.0.   (06 Marks)
    b. Describe the various security mechanisms defined in X.800 services.   (06 Marks)
    c. Explain the modes network security with the aid of diagram.   (08 Marks)

6   a. What is PGP? Explain the PGP cryptographic functions with neat diagrams.   (10 Marks)
    b. Explain the MIME content types of S/MIME functionalities.   (10 Marks)

7   a. Give the application and benefits of IP security.   (06 Marks)
    b. How the Oakley key determination protocol is different from Diffie – Hellman algorithm? Explain.   (06 Marks)
    c. Explain Authentication Header and ESP protocol with formats.   (08 Marks)

8   a. Explain SSL protocol architecture in detail.   (10 Marks)
    b. What is SET? Explain how the cardholder sends purchase request via SET.   (10 Marks)

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Eighth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Ad-hoc Networks

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a.   List and explain the application of Ad-hoc wireless network.   **(10 Marks)**
    b.   With the help of neat diagram explain Ad-hoc wireless internet.   **(10 Marks)**

2   a.   Explain the design goals of a MAC protocol for Ad-hoc wireless networks.   **(06 Marks)**
    b.   Briefly explain 5 phase reservation protocol with frame structure.   **(08 Marks)**
    c.   Explain MACA with Piggy–Backed reservation.   **(06 Marks)**

3   a.   Explain the use of directional antennas in MAC protocols for Ad-hoc networks.   **(06 Marks)**
    b.   With the help of figure, explain Distributed Laxity Based Privities Scheduling Scheme (DLSP).   **(08 Marks)**
    c.   Explain interleaved carrier sense multiple access protocol.   **(06 Marks)**

4   a.   Explain any DSDV table driven routing protocol for Ad-hoc wireless network.   **(10 Marks)**
    b.   Explain the working of Adhoc on –Demand Distance Vector Routing Protocol (AODV).   **(10 Marks)**

PART – B

5   a.   Explain ZRP (Zone Routing Protocol) with figure.   **(10 Marks)**
    b.   Explain Preferred Link Based Routing Protocol (PLBR).   **(10 Marks)**

6   a.   Explain the issues and design goals of transport layer protocol for Ad-hoc wireless network.   **(10 Marks)**
    b.   Give five reasons stating why TCP doesn't work well in Ad-hoc wireless network. **(10 Marks)**

7   a.   Explain the four key network security requirements.   **(04 Marks)**
    b.   Briefly explain issues and challenges in security provisioning.   **(08 Marks)**
    c.   Explain with diagram, security aware Ad-hoc routing protocol.   **(08 Marks)**

8   a.   Briefly explain the issues and challenges in providing QoS in Ad-hoc wireless networks.   **(08 Marks)**
    b.   Explain the cluster-TDMA protocol used for providing MAC layer QoS solution in Ad-hoc networks.   **(06 Marks)**
    c.   Write a note on hard state versus soft state resource reservation.   **(06 Marks)**

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