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10IS81

**Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Software Architectures**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. With the help of neat block diagram of ABC (architecture business cycle), explain in detail the different activities which are involved in creating a software architecture. (10 Marks)  
b. Briefly explain, what does software architecture constitute. (05 Marks)  
c. Describe the architectural structure of a system. (05 Marks)
- 2 a. Enlist architectural styles and explain event-based, implicit invocation, in brief. (08 Marks)  
b. State the problem of “key words in contex”. Propose solution through,  
i) Abstraction data types  
ii) Implicit invocation solution. (12 Marks)
- 3 a. What are the qualities that the architecture itself should posses? (06 Marks)  
b. List the parts of quality attributes scenario. (04 Marks)  
c. What is the goal of tactics for testability? Discuss the two categories of tactics for testing. (10 Marks)
- 4 a. Explain different steps involved in the implementation of pipe and filters architecture pattern. (10 Marks)  
b. Discuss in brief the pattern, from mud to structure. (10 Marks)

**PART – B**

- 5 a. Explain the broker architectural pattern to structure distributed software system. (10 Marks)  
b. What is model-view architectural pattern? With an example illustration, write its structure and implementation over a scenario. (10 Marks)
- 6 a. Enumerate the implementation of a micro-Kernel pattern. (10 Marks)  
b. Explain the reflection architectural pattern and its known uses. (10 Marks)
- 7 Write short notes on :  
a. Design pattern  
b. Master-slave pattern  
c. Whole-part pattern  
d. Proxy pattern (20 Marks)
- 8 a. Explain ADD and its steps. (08 Marks)  
b. List the steps in documenting a view for architecture. (07 Marks)  
c. What are the uses of architectural documentation? (05 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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10CS82

**Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**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. A grocery store has one checkout counter. Customers arrive at this checkout counter at random 1 to 10 minute apart. Each inter arrival times has the same probability of occurrence. The service times vary from 1 to 6 minutes. Assume that 1<sup>st</sup> customer arrive at time 0.

Time between arrivals	1	2	3	4	5	6	7	8	9	10
Probability	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10

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

Random digits for arrivals	-	72	15	94	39
Random digits for service time	84	10	74	53	17

Simulate the arrival of 5 customers and calculate the:

- i) Average waiting time of customers.
  - ii) Probability of a customer has to wait.
  - iii) Probability of server being Idle.
- Depict the simulation in a tabular form. (10 Marks)
- b. With a neat flow chart explain in detail about the steps in simulation study. (10 Marks)
- 2 a. Explain event scheduling / time advance algorithm with an example. (08 Marks)
- b. 6 dump trucks are used to haul coal from the entrance of a small mine to rail road. Each track is loaded by one of 2 loaders. After loading, the truck immediately moves to the scale, to be weighed as soon as possible. Both the loaders and the scale have a FCFS waiting line for trucks. Travel time from a loader to the scale is considered negligible. After being weighed, a truck begins a travel and then afterward returns to the loader queue. The distribution of loading time, weighing time and travel time are given below. Estimate the loader and scale utilization. Assume 5 trucks are at the loader and one is at the scale, at time '0' stopping time  $T_E = 64$  min. (12 Marks)

Loading time	10	5	5	10	15	10	10
Weigh time	12	12	12	16	12	16	
Travel time	60	100	40	40	80		

- 3 a. i) What is a system? Explain the various components of simulation with an example.
- ii) Explain the flow diagram for the execution of the arrival and departure events. (10 Marks)
- b. Prepare a simulation table using time advance algorithm for a single channel queue. Stopping event will be at 30 min. Interarrival time and service times are given below. Find the busy time of server and maximum queue length (MQ). (10 Marks)

IA Time	8	6	1	8	3	8	7
ST	4	1	4	3	2	4	5

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- 4 a. Explain the different characteristics of queuing systems. (10 Marks)  
b. List the different queuing notations used in the queuing systems. (05 Marks)  
c. Two workers competing for a job. Able claims an average service time is faster than Baker's, but Baker claims to be more consistent, even if not as fast. The arrival occurs according to a Poisson process at the rate  $\lambda = 2/\text{hr}$ . Able service statistics are an average service time of 24 minutes with a standard deviation of 20 minutes. Baker's service statistics are an average service time of 25 minutes, but a standard deviation of only 2 minutes. If the average length of the queue is the criterion of hiring, which worker should be hired? (05 Marks)

**PART – B**

- 5 a. Discuss different types of continuous distributions. (10 Marks)  
b. A production process manufactures computer chips on the average at 2% non conforming. Everyday, a random sample of size 50 is taken from the process. If the sample contains more than two non conforming chips, the process will be stopped. Compute the probability that the process is stopped by the sampling scheme. (10 Marks)
- 6 a. Discuss different techniques used for generating random numbers. (10 Marks)  
b. Explain frequency test and discuss the two different methods (tests) used for testing uniformity property in frequency test. (10 Marks)
- 7 a. Explain different steps in the development of useful model of input data with example. (10 Marks)  
b. i) Explain different ways to obtain information about a process even if data are not available.  
ii) List different suggested estimates for distribution used in simulation. (10 Marks)
- 8 a. Explain with a neat diagram model building and verification and validation process. (10 Marks)  
b. Describe the 3 steps approach to validation by Naylor and finger. (10 Marks)

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10CS/IS835

**Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Information and Network Security**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Explain the relationship between policies, standards and practices with a diagram. (06 Marks)  
b. Explain EISP and its components. (08 Marks)  
c. Explain the components of contingency planning. (06 Marks)
- 2 a. Discuss five major processing – mode categories of firewalls. (10 Marks)  
b. Define VPN and explain briefly the different modes to implement VPN. (10 Marks)
- 3 a. Explain different types of IDP system. (10 Marks)  
b. Define Honey pot. List its advantages and disadvantages. (10 Marks)
- 4 a. Explain any 3 types of cryptographic tools. (12 Marks)  
b. Explain transposition cipher method with an example. (08 Marks)

**PART – B**

- 5 a. Explain the model for network security. (06 Marks)  
b. Describe the security services defined in X.800. (08 Marks)  
c. Differentiate between Kerberos version 4 and 5. (06 Marks)
- 6 a. Explain the different types of PGP services. (05 Marks)  
b. With a neat diagram, explain the general format of PGP message. (07 Marks)  
c. Explain functions and cryptographic algorithms used in S/MIME functionality. (08 Marks)
- 7 a. Give the general structure of IPsec authentication header. Describe how anti – replay service is supported. (10 Marks)  
b. What is security association? Discuss various parameters used to describe a security association database. (10 Marks)
- 8 a. Explain SSL protocol stack and discuss session and connection state parameters. (10 Marks)  
b. Explain the requirements and features of secure electronic transaction. (10 Marks)

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10CS/IS841

**Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Ad-hoc Networks**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. List out any 10 differences between cellular networks and ad hoc wireless networks. (10 Marks)
- b. Discuss following applications of Ad Hoc wireless networks  
i) Collaborative and Distributed computing (04 Marks)  
ii) Emerging operations. (06 Marks)
- c. Explain the following issues need to be considered when an ad hoc wireless system is to be designed i) Scalability ii) Self organization. (06 Marks)
- 2 a. Explain the issues that need to be addressed while designing a MAC protocol for ad hoc networks. (10 Marks)
- b. Describe the three types of MAC protocols. (06 Marks)
- c. Explain the frame format in CATA with neat diagram. (04 Marks)
- 3 a. Explain MAC protocol using Directional Antennas. (10 Marks)
- b. Discuss multichannel MAC protocol in detail. (10 Marks)
- 4 a. List out at least 10 characteristics of an Ideal routing protocol for Ad Hoc wireless networks. (10 Marks)
- b. Explain the route establishment and route maintenance in signal stability based Adaptive Routing protocols with an example. (10 Marks)

**PART – B**

- 5 a. Explain zone routing protocol and its advantages and disadvantages. (10 Marks)
- b. Write a note on power – aware routing protocols. (10 Marks)
- 6 a. List out the design goals of a transport layer protocol for Ad – hoc wireless network. (10 Marks)
- b. Explain Feedback –Based TCP with an example. (10 Marks)
- 7 a. Brief about the issues and challenges in security provisioning. (06 Marks)
- b. List out the Network security requirements. (04 Marks)
- c. Explain security Aware Ad Hoc Routing protocol. (10 Marks)
- 8 a. Write a note on the following design choices for providing QOS support  
i) Hard state versus soft state resource reservation (10 Marks)  
ii) Statefull versus stateless approach. (10 Marks)
- b. Explain cluster TDMA. (10 Marks)

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