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10IS81

**Eighth Semester B.E. Degree Examination, Aug./Sept.2020**  
**Software Architecture**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Why software architecture is important? (04 Marks)  
b. Define Software Process. Explain its activities. (08 Marks)  
c. Explain module and allocation structures. (08 Marks)
- 2 a. Explain the control loop solution for mobile robot. (06 Marks)  
b. Explain KWIC with implicit invocation scheme. (06 Marks)  
c. Define the following with an example:  
(i) Set point (ii) Controlled variable  
(iii) Feed control system (iv) Feed forward control system. (08 Marks)
- 3 a. What is availability? Explain the general scenario for availability. (08 Marks)  
b. Explain Business Qualities. (06 Marks)  
c. Explain Usability Tactics. (06 Marks)
- 4 a. What are the CRC's of a blackboard pattern? (06 Marks)  
b. Explain the scenarios of pipes and fillers pattern. (08 Marks)  
c. Explain any six implementation steps of layer pattern. (06 Marks)

**PART – B**

- 5 a. Explain the benefits and liabilities of broker pattern. (07 Marks)  
b. Explain the dynamic scenarios of MVC pattern. (08 Marks)  
c. Explain any 5 implementation steps of PAC pattern. (05 Marks)
- 6 a. What are the known uses of reflection pattern? (05 Marks)  
b. What are the steps involved in implementing microkernel pattern. (10 Marks)  
c. Explain Reflection pattern with its content, problem and solution. (05 Marks)
- 7 a. List and explain the steps to implement a whole-part structure. (10 Marks)  
b. What are the benefits and liability of proxy structure? (05 Marks)  
c. Explain the steps to implement Master Slave structure. (05 Marks)
- 8 a. Explain the steps involved in designing an architecture using ADD. (10 Marks)  
b. Explain the parts of a document view. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
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**Eighth Semester B.E. Degree Examination, Aug./Sept. 2020**  
**System Modeling & 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 diagram, explain the steps in simulation study. (10 Marks)  
 b. A small shop has one checkout counter. Customers arrive at this checkout counter at random time from 1 to 10 minutes apart. Each possible value of inter arrival time has the same probability of occurrence equal to 0.10. Service time varies from 1 to 6 minutes with distribution as shown in table Q1 (b).

Table Q1 (b) – Service distribution

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

Develop simulation table for 10 customers. Find average waiting time, average service time, and average time. Customer spends in system. Consider random digits for arrivals as 91, 72, 15, 94, 30, 92, 75, 23 and 30 for services as 84, 10, 74, 53, 17, 79, 91, 67, 89 and 38 sequentially. (10 Marks)

- 2 a. Explain the terms : System, Model, System state, List, Event notice, Event list. (06 Marks)  
 b. Six dump trucks are used to haul coal from the entrance of a mine to the railroad. There are two loaders and one weighing scale. Each truck is loaded by one of the two loaders. After a loading, the truck immediately moves to the scale to be weighed. The queue system at the loaders and weigh scale are ordered on a first-come-first-served basis. After being weighed a truck begins a travel time and then afterward returns to the loader queue. Model and construct the simulation table. Estimate the average loader utilization and average scale utilization. The stopping time of simulation is completion of four weighing from the scale or after 10 iterations? Assume four trucks are at the loaders and two are at the scale at time  $t = 0$ . The activity times are given in Table Q2 (b). (14 Marks)

Table Q2 (b)

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

- 3 a. Explain the following discrete distributions:  
 (i) Binomial distribution (ii) Negative Binomial distribution. (06 Marks)  
 b. Explain the following continuous distributions:  
 (i) Uniform distribution (ii) Exponential distribution. (06 Marks)  
 c. Suppose that the life of an industrial lamp, in thousand of hours, is exponentially distributed with failure rate  $\lambda = \frac{1}{3}$  (one failure every 3000 hours, on the average). Find (i) The probability that the lamp will last longer than its mean life. (ii) The probability that the lamp will last between 2000 and 3000 hours (iii) The probability that the lamp will last another 1000 hours; given that it is operating after 2500 hours. (08 Marks)

- 4 a. Explain the characteristics of queuing system. (05 Marks)  
 b. List the different queuing notation for parallel server systems and the steady state parameters of the M/G/1 queue. Explain very briefly. (10 Marks)  
 c. Malfunctioning of machines occurs according to a Poisson process, at the rate  $\lambda = 1.5$  per hour. Repair by a single mechanic take an average time of 30 minutes, with a standard deviation of 20 minutes. Find the average broken machines over the long run. (05 Marks)

**PART – B**

- 5 a. Explain linear congruential method/technique for generating random numbers. How maximal period can be achieved? Explain. (05 Marks)  
 b. The sequence of numbers 0.44, 0.81, 0.14, 0.05 and 0.93 are generated. Use the Kolmogorov-Smirnov test with  $\alpha = 0.05$ , to learn whether the hypothesis, that the numbers are uniformly distributed on the interval  $[0, 1]$  can be rejected? Take  $D_{0.05} = 0.565$ . (05 Marks)  
 c. Buses arrive at the bus stop according to a Poisson process with a mean of one bus per 15 minutes. Generate a random variate,  $N$ , which represents the number of arriving buses during a 1-hour time slot. Random numbers are 0.4375, 0.4146, 0.8353, 0.9952, 0.8004, 0.7945, 0.1530 (10 Marks)
- 6 a. Explain different steps in the development of a useful model of input data. (06 Marks)  
 b. List any four suggested estimators for distributions often used in simulation. (04 Marks)  
 c. The number of vehicles arriving at the northwest corner of an intersection in a 5-minute period between 7.00 AM and 7.05 AM was monitored for five workdays over 20 week period. The following Table Q6 (b) shows the resulting data and appear to follow Poisson distribution. Apply Chi-square Goodness of fit test at 0.05 level of significance. The critical value  $\chi_{0.05,5}^2$  is 11.1. (10 Marks)
- 7 a. Explain the types of simulation with respect to output analysis. Give examples. (10 Marks)  
 b. Explain the replication method for steady-state simulation. (10 Marks)
- 8 a. Explain with a neat diagram, the model building verification and validation. (10 Marks)  
 b. With a neat diagram, explain the iterative process of calibrating a model. (10 Marks)

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10CS/IS835

**Eighth Semester B.E. Degree Examination, Aug./Sept. 2020**  
**Information and Network Security**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Define policy. Discuss the system specific security policy. (10 Marks)  
b. Explain the major steps specified in BS7799 : 2 document. Show these steps help in security planning. (10 Marks)
- 2 a. What is a firewall? Explain categories of firewall based on processing mode. (10 Marks)  
b. What are virtual private networks? Explain different modes of a VPN. (10 Marks)
- 3 a. What is an intrusion? Explain briefly about any eight IDPS terminologies. (10 Marks)  
b. Write short note on Honey pots, Honey nets 2 Dadded cell system. (06 Marks)  
c. Briefly explain the need of operating system detection tools. (04 Marks)
- 4 a. Define cryptography. Explain briefly principles of cryptography. (10 Marks)  
b. Who can attack cryptosystems? Discuss different categories of attacks on cryptosystems. (10 Marks)

**PART – B**

- 5 a. What are different security mechamsins? Briefly explain them. (10 Marks)  
b. With neat diagram, explain network security model. (06 Marks)  
c. Distinguish between active and passive attacks. (04 Marks)
- 6 a. With flow charts, explain the process of transmission and reception of PGP messages. (10 Marks)  
b. Describe S/MIME functionality. (05 Marks)  
c. Explain S/MIME certificate processing method. (05 Marks)
- 7 a. Explain IP security architecture with diagram. (10 Marks)  
b. With neat diagram, discuss the basic combinations of security associations. (10 Marks)
- 8 a. Write short notes on : (10 Marks)  
i) SSL handshake protocol  
ii) SSL alert protocol.  
b. List out the key features of secure electronic transaction and explain in detail. (10 Marks)

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10CS/IS841

**Eighth Semester B.E. Degree Examination, Aug./Sept. 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 different applications of Ad-hoc wireless networks. (10 Marks)  
b. Explain the issues that makes wireless sensor network a distinct category of Ad-hoc wireless networks. (10 Marks)
- 2 a. Explain collision avoidance time allocation protocol frame format with a diagram. (05 Marks)  
b. What are the design goals to be met while designing a MAC protocol for Ad-hoc networks? (05 Marks)  
c. Explain with example, a working principle of Five-Phase Reservation Protocol (FPRP). (10 Marks)
- 3 a. Explain the working principle of multi-channel MAC (MMAC) protocol. (08 Marks)  
b. Explain MAC protocol using directional antennas. (06 Marks)  
c. Explain the operation of distributed priority scheduling (DPS) protocol. (06 Marks)
- 4 a. With an example, explain the process of route establishment in wireless routing protocol along with its advantages and disadvantages. (10 Marks)  
b. Write the classification of routing protocol in detail. (10 Marks)

**PART – B**

- 5 a. Explain the operation of Fisheye state routing protocol (FSRP). (10 Marks)  
b. What are the advantages and disadvantages of CEDAR protocol? (03 Marks)  
c. Explain zone routing protocol. (07 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. Discuss the requirements and challenges in security provisioning for Ad-hoc wireless networks. (10 Marks)  
b. Give the classification of security attacks on Ad-hoc wireless networks. (04 Marks)  
c. List and give brief explanation of network layer attacks. (06 Marks)
- 8 a. Discuss the working principle of Ticket – based QoS routing protocol. (10 Marks)  
b. Explain the issues in providing QoS in Ad-hoc wireless network. (10 Marks)

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