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

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. Briefly explain software architecture with definitions.   **(05 Marks)**
   b. 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)**
   c. Why is software architecture important?   **(05 Marks)**

2 a. Explain in brief about KWIC (Keyword in Context) with shared data solution.   **(10 Marks)**
   b. Enlist architectural styles and explain event-based, implicit invocation.   **(06 Marks)**
   c. Explain the advantages and disadvantages of pipes and filters in architectural style.**(04 Marks)**

3 a. What is modifiability? Explain general scenario for modifiability.   **(10 Marks)**
   b. Explain in brief the business qualities.   **(04 Marks)**
   c. Explain how faults are detected and prevented.   **(06 Marks)**

4 a. What do you mean architectural pattern? How it is categorized? Explain the structure part of the solution for ISO layered architecture.   **(10 Marks)**
   b. Explain the steps involved in the implementation of pipes and filters architecture. **(10 Marks)**

PART – B

5 a. What do you mean by broker architecture? What are the steps involved in implementing distributed broker architecture pattern?   **(10 Marks)**
   b. Write benefits of MVC.   **(05 Marks)**
   c. What are the liabilities of PAC?   **(05 Marks)**

6 a. What are the steps involved in implementing the microkernel system?   **(10 Marks)**
   b. Explain the dynamic scenarios of reflection with neat diagram.   **(10 Marks)**

7   Write notes on:
   a. Design pattern
   b. Master-Slave pattern
   c. Whole-part pattern
   d. Proxy pattern
   e. Command processor   **(20 Marks)**

8 a. Explain the steps performed when designing an architecture using the ADD method.
                                                                                   (10 Marks)
   b. Write short notes any two of following:
      i)   Forming team structures
      ii) Documenting across views
      iii) Documenting interfaces.   **(10 Marks)**

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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)**

1 of 2

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 2nd, 9th, 16th …….. 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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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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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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Eighth Semester B.E. Degree Examination, June/July 2016
Service Oriented Architecture

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 common tangible benefits of SOA.   **(10 Marks)**
   b. Define SOA. Analyze how SOA is influenced in hybrid web service architecture with the help of a neat diagram.   **(10 Marks)**

2 a. Explain the basic web services design concepts.   **(10 Marks)**
   b. Explain the organization of a service description document.   **(06 Marks)**
   c. What is service contract?   **(04 Marks)**

3 a. Explain the metadata exchange security (MEP's) supported by WSDL1.1 and WSDL2.0(web service description).   **(10 Marks)**
   b. What is coordination? Explain WS–coordination registration process with the help of a neat diagram.   **(10 Marks)**

4 a. Explain the WS – metadata exchange specification.   **(10 Marks)**
   b. With the help of neat diagram explain WS–reliable messaging.   **(10 Marks)**

PART – B

5 a. List the common principles of SOA. Explain any two principles in detail.   **(10 Marks)**
   b. Compare service oriented principles to object – oriented principles.   **(10 Marks)**

6 a. What are the problems solved by layering services? Explain them briefly.   **(10 Marks)**
   b. What do you mean by the term "agnertio service"? Describe any two service layer configuration scenarios.   **(10 Marks)**

7 a. Explain service oriented business process design.   **(10 Marks)**
   b. Explain : i) WS – reliable messaging language basics
            ii) WS – BPEL language basics.   **(10 Marks)**

8 Explain the fundamental service technology architecture.   **(10 Marks)**
   Elaborate support for SOA in ·NET framework.   **(10 Marks)**

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