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06CS81

**Eighth Semester B.E. Degree Examination, December 2012**  
**Advanced Computer Architecture**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. List and explain four important technologies which have led to the improvements in computer system. (10 Marks)
- b. Give a brief explanation about trends in power in integrated circuits and cost. (10 Marks)
- 2 a. Explain the pipeline hazards, in detail. (10 Marks)
- b. Show java loop is unrolled so that there are four copies of the loop body, assuming  $R_1 - R_2$  (that is, the size of the array) is initially a multiple of 32, which means that the number of loop iterations is a multiple of 4. Eliminate any obviously redundant computations and do not reuse any of the registers. (10 Marks)
- 3 a. What is dynamic prediction? Draw the state transition diagram for 2 bit prediction scheme? (04 Marks)
- b. What is the basic compiler technique for exposing ILP? (06 Marks)
- c. How to overcome the data hazards with dynamic scheduling? (10 Marks)
- 4 a. How do exploit ILP, using multiple issues and dynamic scheduling? (10 Marks)
- b. What is the basic concept of VLIW approach? (10 Marks)

**PART – B**

- 5 a. Explain the symmetric shared memory architecture, in detail. (10 Marks)
- b. Explain in detail, the distributed shared memory and directory based coherence. (10 Marks)
- 6 a. How to protect virtual memory and virtual machines? (10 Marks)
- b. Assume that the hit time of a two –way set-associative first –level data cache is 1.1 times faster than a four-way set-associative cache of the same size. The miss rate falls from 0.049 to 0.044 for an 8 KB data cache. Assume a hit is 1 clock cycle and that the cache is the critical path for the clock. Assume the miss penalty is 10 clock cycles to the L2 cache for the two-way set-associative cache, and that the L2 cache does not miss. Which has the faster average memory access time? (05 Marks)
- c. Suppose you measure a new DDR3 DIMM to transfer at 16000 MB/sec. what do you think its name will be? What is the clock rate of that DIMM? What is your guess of the name of DRAMS used in that DIMM? (05 Marks)
- 7 a. Describe eleven advanced optimizations for cache performance. (12 Marks)
- b. What is memory technology and optimization? (08 Marks)
- 8 a. How to enhance the loop level parallelism? (10 Marks)
- b. What all are the hardware support for exposing parallelism? (10 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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06CS82

**Eighth Semester B.E. Degree Examination, December 2012**  
**System Modeling and Simulation**

Time: 3 hrs.

Max. Marks:100

- Note: 1. Answer FIVE full questions**  
**atleast TWO questions from each part.**  
**2. Use statistical tables are permitted.**

**PART – A**

- 1 a. List the circumstances under which simulation is the appropriate tool and circumstances under which simulate is not the appropriate tool. (10 Marks)
- b. Explain in brief, with a neat figure the steps involved in simulation study. (10 Marks)
- 2 a. With the help of a flow diagram, explain the simulation of single channel queuing system. (10 Marks)
- b. One company uses 6 tracks to haul manganese are from Kolar to its industry. There are two loaders to load each truck. After loading, a track movers to the weighing scale to be weighted. The queue discipline is FIFO. When it is weighted 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 times :	10	5	5	10	15	10	10		
Weigh times	12	12	12	16	12	16			
Travel times	60	100	40	40	80				

Calculate the total busy time of both loaders, of the scale average loader and scale utilization. Assume 5 trucks are at the loaders and one is at the scale at time '0' stopping time  $T_E = 64$  min. (10 Marks)

- 3 a. Explain discrete random variables and continuous random variables, with examples and explain any two discrete distributions. (10 Marks)
- b. A production process manufactures alternators for outboard engines used in recreational boating. On the average, 1% of the alternators will not perform up to the required standards. When tested at the engine assembling plant. When shipment of 100 alternators is received at plant, they are tested, and if more than two are non confirming, the shipment is returned to the alternators manufacture. What is the probability of returning a shipment? (10 Marks)
- 4 a. Explain the characteristics of queuing system. List the different queuing notations. (10 Marks)
- b. For the following sequence can the hypothesis that the numbers are uniformly distributed, on the basis of length using chi-square test.  $X_{0.05,9}^2 = 16.9$

0.34	0.90	0.25	0.89	0.87	0.44	0.12	0.21	0.46	0.67
0.83	0.76	0.79	0.64	0.70	0.81	0.94	0.74	0.22	0.74
0.96	0.99	0.77	0.67	0.56	0.41	0.52	0.73	0.99	0.02
0.47	0.30	0.17	0.82	0.56	0.05	0.45	0.31	0.78	0.05
0.79	0.71	0.23	0.19	0.82	0.93	0.65	0.37	0.39	0.42

(10 Marks)

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## PART - B

- 5 a. Explain the different techniques used for generating random numbers, with examples. (10 Marks)
- b. The sequence of numbers 0.44, 0.81, 0.14, 0.05, 0.93 has been generated use the Kolmogorov - Smirnov test with  $\alpha = 0.05$  to determine if the hypothesis that the numbers are uniformly distributed on the interval  $[0, 1]$  can be rejected. Compare  $F(x)$  and  $S_N(x)$ . [where  $D_{0.05,5} = 0.565$ ]. (10 Marks)
- 6 a. Explain the types of simulation, with respect to output analysis give at least two examples. (10 Marks)
- b. Consider the 30 two digit numbers in the sequence given below. Test whether the 3<sup>rd</sup>, 8<sup>th</sup>, 13<sup>th</sup> and so on, numbers in the sequence are auto correlated. Where  $\alpha = 0.05$  and  $[Z_{0.025} = 1.96]$

0.12	0.01	0.23	0.28	0.89	0.31	0.64	0.28	0.83	0.93
0.99	0.15	0.33	0.35	0.91	0.41	0.60	0.27	0.75	0.88
0.68	0.49	0.05	0.43	0.95	0.58	0.19	0.36	0.69	0.87

(10 Marks)

- 7 a. What do you mean by verification and validation of simulation model? Explain calibration and validation of models, with the help of diagram. (10 Marks)
- b. Explain Chi - square goodness of fit test. Apply it to Poisson assumption with  $\alpha = 3.64$ , data size = 100 and observed frequency. [where  $X_{0.05,5}^2 = 11.1$ ]  
 $O_i$  12 10 19 17 10 8 7 5 5 3 3 1. (10 Marks)
- 8 a. Explain with neat diagram, model building, verification and validation. (10 Marks)
- b. Write short notes on :  
 i) Optimization via simulation  
 ii) Time advance algorithm. (10 Marks)

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06CS/IS835

**Eighth Semester B.E. Degree Examination, December 2012**  
**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. What is security policy? Explain three types of security policies? (10 Marks)  
b. What are the three components of contingency planning? Explain with figure. (10 Marks)
- 2 a. What is firewall? Explain five major processing mode categories of firewalls. (10 Marks)  
b. Explain the following:  
i) RADIUS ii) TACAS iii) Diameter iv) Virtual private networks (VPN) (10 Marks)
- 3 a. Write note on the following:  
i) Honey nets ii) Padded cell systems. (10 Marks)  
b. Explain different protocols used for secure communications? (10 Marks)
- 4 a. What are the different tools used in cryptography? Explain. (10 Marks)  
b. List out the various stacks of the cryptosystem. (10 Marks)

**PART – B**

- 5 a. List out the five categories of security services and explain in detail. (10 Marks)  
b. Differentiate between Kerberos version 4 and version 5. (10 Marks)
- 6 a. Explain the actual operations of PGP, as opposed to the management of keys for different services. (10 Marks)  
b. Describe the S/MIME functionality. (05 Marks)  
c. Explain different types of S/MIME messages. (05 Marks)
- 7 a. Explain the authentication header with neat figure. (06 Marks)  
b. Draw the format of ESP packet and explain the fields. (06 Marks)  
c. What is ISAKMP? Explain the header format of ISAKMP with neat figure. (08 Marks)
- 8 a. Explain the SSL Architecture? (10 Marks)  
b. Explain the key features of secure electronic transactions. (10 Marks)

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06CS846

**Eighth Semester B.E. Degree Examination, December 2012**  
**Programming Languages**

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 a frame with respect to stack based allocation? With relevant diagram, explain the contents and importance of activation record. (10 Marks)  
b. What is binding and binding time? Explain various binding times with suitable examples. (10 Marks)
- 2 a. What is precedence and associativity of operators in PL? Explain the same taking the arithmetic operators of C language. (06 Marks)  
b. Explain the difference between prefix, infix and postfix notation. What is Cambridge polish notation? Name two programming languages those uses post fix notation. (06 Marks)  
c. Discuss on subroutine closures, first and second class subroutines in the bindings of referencing environments. (08 Marks)
- 3 a. Describe the various “iteration count” loop implementation methods. (08 Marks)  
b. Explain with suitable examples, the characteristics of sequencing and selection control flows in PLC. (08 Marks)  
c. What as tail recursive function? Explain the tail recursive function for finding gcd. (04 Marks)
- 4 a. Explain numeric, enumeration, subrange and composite types in various programming languages. (08 Marks)  
b. What is type inference? Describe the contents in which it occurs. (08 Marks)  
c. Explain the difference between row major and column major layouts with contiguously allocated arrays. (04 Marks)

**PART – B**

- 5 a. What are dangling references? How are they created? What problems do they result in? Explain with examples. (08 Marks)  
b. What is garbage collection? Explain reference count and tracing collection as a means of solving garbage collection? Explain its disadvantage with relevant diagram. (10 Marks)  
c. What is pointer reversal? What problem does it address? (02 Marks)
- 6 a. Explain any five parameter passing methods. (10 Marks)  
b. Explain the default and named special purpose parameters with suitable examples. (08 Marks)  
c. What is meant by subroutine prologue and epilogue? State any two important functions performed by prologue and epilogue. (02 Marks)

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- 7 a. Define multiple inheritance, repeated inheritance, replicated inheritance and shared inheritance with an example and list the semantic and pragmatic issues associated with multiple inheritance. (10 Marks)
- b. What are generally considered to be the five defining characteristics of object oriented programming? (05 Marks)
- c. Briefly bring out the concept of coroutines in PL. (05 Marks)
- 8 a. Explain the following LISP functions, with examples: i) cor ii) cdr iii) cons iv) cond v) let. (10 Marks)
- b. What are following with respect to logic programming:
- i) Horn clause
  - ii) Resolution and unification.
  - iii) Terms in prolog.
  - iv) Structure in prolog. (10 Marks)

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