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10CS72

Seventh Semester B.E. Degree Examination, June/July 2016
Embedded Computing Systems

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 Embedded system? Give one example. **(02 Marks)**

b. Explain briefly the characteristics of Embedded computing application. **(10 Marks)**

c. Write the top-down view of the embedded system design process and write a requirement chart of model train controller. **(08 Marks)**

2 a. Write ARM assembly code to implement the following C assignment.
$z = a (b + c) - d * e$ **(04 Marks)**

b. What is an interrupt priorities mechanism used to handle multiple device interrupts? **(08 Marks)**

c. What is cache? How it relates to memory system mechanism? Explain different types of cache miss. **(08 Marks)**

3 a. Explain a bus with a DMA controller mechanism? **(08 Marks)**

b. Differentiate between Random accesses memories and Read only memories. **(04 Marks)**

c. List out the I/O devices commonly used in embedded computing systems. Explain briefly any three I/O devices. **(08 Marks)**

4 a. For a give basic block, rewrite it in single assignment form and then draw the dataflow graph.
$w = a + b$
$x = a - c$
$y = x + d$
$x = a + c$
$f = y + e$ **(06 Marks)**

b. Explain any two program optimization Techniques. **(08 Marks)**

c. Write a short note on alarm clocks. **(06 Marks)**

PART – B

5 a. Explain the basic function of Real time kernel. **(10 Marks)**

b. Give different between monolithic kernel and micro kernel. **(04 Marks)**

c. Define process. With a diagram, explain state transition of a process. **(06 Marks)**

6 a. What is Interprocess Communication (IPC)? Give an overview of different types of IPC mechanisms adopted by various operating systems. **(10 Marks)**

b. What is deadlock? What are the different conditions favoring deadlock? **(05 Marks)**

c. Explain the different functional requirement that needs to be evaluated in the selection of an RTOS. **(05 Marks)**

7 a. Explain the structure and characteristics of an I^2C bus. **(10 Marks)**

b. Explain Ethernet packet format. **(05 Marks)**

c. Explain the following terms :
Internet security, Internet service stack **(05 Marks)**

8 a. Explain the following interated development Environment
Simulators
Emulators
Debugger **(12 Marks)**

b. Explain the different tools used for hardware debugging. **(08 Marks)**

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10CS73

Seventh Semester B.E. Degree Examination, June/July 2016
Programming the Web

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Explain standard XHTML document structure. **(06 Marks)**
b. What is Web server? Describe its general characteristics. **(06 Marks)**
c. Explain with an example the following tags :
i) <a> ii)<img> iii) <meta> iv) <pre>. **(08 Marks)**

2 a. Explain syntactic differences between HTML and XHTML. **(06 Marks)**
b. Explain various selector forms with an example. **(06 Marks)**
c. Develop a complete XHTML document with proper headings, a table with four rows and three columns, a form with two labels, two textbox three checkbox, three radio buttons, a submit and a reset button. (Assume suitable content for the web page). **(08 Marks)**

3 a. Describe differences between primitives and objects in Javascript. **(04 Marks)**
b. With an example, explain the following :
i) document·write ii) alert iii) confirm iv) prompt. **(08 Marks)**
c. Write a XHTML document containing a Javascript function to compute the median of an array of numbers with at least two different data sets. **(08 Marks)**

4 a. Explain the navigator object with an example. **(07 Marks)**
b. Explain the following positioning elements with example. **(06 Marks)**
i) Absolute positioning
ii) Relative positioning.
c. Explain element visibility with an example. **(07 Marks)**

PART – B

5 a. With respect to XML schemas, explain complex types. **(07 Marks)**
b. Explain XSLT processing with an example. **(07 Marks)**
c. Describe XML namespaces and their definition syntax. **(06 Marks)**

6 a. Explain for each statement in Perl with an example. **(04 Marks)**
b. Explain Rembering matching with an example. **(05 Marks)**
c. Explain any five CGI·pm functions. **(05 Marks)**
d. Describe built-in list functions in Perl. **(06 Marks)**

7 a. Describe logical internal structure of an array in PHP. **(05 Marks)**
b. Explain any five commonly used string functions in PHP. **(05 Marks)**
c. Create a XHTML document with PHP to display the number, square root, square, cube and quadruple using sqrt and pow functions. (The output should contain 10 number). **(10 Marks)**

8 a. Explain with an example any four built-in methods for arrays and lists in ruby. **(08 Marks)**
b. Explain directory structure of rails application. **(06 Marks)**
c. Describe simple input and output in ruby with an example. **(06 Marks)**

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10CS74

Seventh Semester B.E. Degree Examination, June/July 2016
Advanced Computer Architecture

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Define Instruction Set Architecture (ISA). Explain seven dimensions of an ISA. **(10 Marks)**

b. Assume a disk subsystem with the following components and MTTF :
* 10 disks each rated at 1,000,000 hr MTTF
* 1 SCSI controller, 500,000 – hour MTTF
* 1 Power supply, 200,000 – hour MTTF
* 1 Fan, 200, 000 – hour MTTF.
* 1 SCSI cable, 1,000,000 – hour MTTF.

Using the simplifying assumptions that the lifetimes are exponentially distributed and that failures are independent, compute the MTTF of the system as a whole. **(05 Marks)**

c. List and explain four important technologies, which change at a dramatic pace and are critical to modern implementation. **(05 Marks)**

2 a. With a neat diagram, explain the classic five stage pipeline for a RISC processor. **(10 Marks)**

b. List three major hurdles of pipelining. Explain the concept of minimizing data hazards stalls by forwarding using the example below :

```
DADD    R1, R2, R3
DSUB    R4, R1, R5
AND     R6, R1, R7
OR      R8, R1, R9
XOR     R10, R1, R11.
```

(10 Marks)

3 a. Show how the below loop would look on MIPS 5 – stage pipeline, under the following situations. Also find the number of cycles per iteration for each case. Latency of LOAD is 2, ADD.D is 3, store is 1, DADDUI is 2 and Branches is 1. **(12 Marks)**

```
Loop :  L.D     F0, 0(R1)
        ADD.D   F4, F0, F2
        SD      F4, 0(R1)
        DADDUI  R1, R1, # -8
        BNE     R1, R2, Loop
```

i) Without scheduling, without unrolling ii) With scheduling, without unrolling.
iii) With loop unrolling, without scheduling iv) With loop unrolling, with scheduling.

b. What is the drawback of 1 – bit dynamic branch prediction method? Clearly state how it is overcome in 2 – bit prediction. Give the state transition diagram of 2 – bit predictor. **(08 Marks)**

4 a. Explain the basic VLIW approach for exploiting ILP, with multiple issues using the following example. We have a VLIW that could issue two memory references, two FP operations and one integer or branch every clock cycle. Use the unrolled version of the code given in question 3a. How many clock cycles per result does it require? **(10 Marks)**

b. What is Branch Target Buffer? With a neat diagram, explain the steps when using BTB. **(10 Marks)**

PART – B

5 a. With the help of neat diagram, explain the basic structure of centralized shared memory and distributed memory multiprocessor. **(10 Marks)**

b. Explain directory based cache coherence for a distributed memory multiprocessor system along with the state transition diagram. **(10 Marks)**

6 a. List the basic cache optimization techniques. Explain any four. **(10 Marks)**

b. Assume we have a computer where the CPI is 1.0 when all memory accesses hit in the cache. The only data accesses are loads and stores and these total 50% of the instructions. If the miss penalty is 25 clock cycles and the miss rate is 2%, how much faster would the computer be if all instructions were cache hits? **(10 Marks)**

7 a. Which are the major categories of advanced optimizations of cache performance? Explain multibanked caches to increase cache bandwidth. **(10 Marks)**

b. Explain in detail, the architecture support for protecting processes from each other via virtual memory. **(10 Marks)**

8 a. Explain the architecture of IA64 intel processor and also the prediction and speculation support provided. **(10 Marks)**

b. Explain in detail, the hardware support for preserving exception behavoiur during speculation. **(10 Marks)**

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10IS72

Seventh Semester B.E. Degree Examination, June/July 2016
Information Systems

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 information system? With neat diagram, explain the role of e-business in business. **(10 Marks)**

b. Explain component of an information systems in detail. **(10 Marks)**

2 a. Explain briefly how information technology can be used to implement the five basic competitive strategies. **(05 Marks)**

b. With neat figure, explain how a customer focused business builds customer value and loyalty using internet. **(05 Marks)**

c. What is virtual company? List the basic business strategies of virtual companies. Write a diagram how virtual companies uses internet, intranets and extranets to form virtual work groups and support alliance with business partners. **(10 Marks)**

3 a. Explain the enterprise application architecture illustrating the major cross functional enterprise application and their interrelationships. **(10 Marks)**

b. What is targeted marketing? Explain major components for e-commerce. **(05 Marks)**

c. With examples, explain financial management systems. **(05 Marks)**

4 a. With figure. Explain major application clusters in CRM. **(05 Marks)**

b. With a figure, explain how CRM support 3-phases of relationships between a business and its customers. **(05 Marks)**

c. What is SCM? Explain benefits and challenges of SCM. **(10 Marks)**

PART – B

5 a. What is e-commerce? Briefly explain the categories of e-commerce. **(05 Marks)**

b. Explain electronic payment process. Write a neat diagram of secure electronic payment system with many payment alternatives. **(08 Marks)**

c. Explain e-commerce success factors. **(07 Marks)**

6 a. What are the attributes of information quality? Explain. **(05 Marks)**

b. Explain components of a web enabled marketing DSS. **(05 Marks)**

c. Explain major applications areas of AI. **(10 Marks)**

7 a. Explain computer crime. **(08 Marks)**

b. Explain internet worked security defenses. **(05 Marks)**

c. Write a security management steps to protect your computer system resources from hacking and other forms of cyber crimes. **(07 Marks)**

8 a. Explain major components of information technology management. **(06 Marks)**

b. Explain major dimensions of global e business technology management. **(07 Marks)**

c. Write the issues in managing international data communications. **(07 Marks)**

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10IS74

Seventh Semester B.E. Degree Examination, June/July 2016
Data Warehousing and Data Mining

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Define a data warehouse. Describe how a data warehouse is modeled and implemented using the star schema. Explain using example. **(08 Marks)**

b. What is ODS and what is it used for? Explain. **(04 Marks)**

c. What is ETL? Give three reasons for dirty data being extracted from source system. **(04 Marks)**

d. Discuss about the benefits of implementing a data warehouse. **(04 Marks)**

2 a. Define OLAP. Give two definitions. **(04 Marks)**

b. What is data cube? What are the different implementations of data cube? Explain. **(06 Marks)**

c. Explain the differences between ROLAP and MOLAP. **(06 Marks)**

d. Describe the operations of Data cube. **(04 Marks)**

3 a. What is Data Mining? Explain the four core data mining tasks with one application on each task. **(10 Marks)**

b. For the following vectors X & Y. Calculate the Cosine, Correlation, Euclidean and Jaccord similarity. X = (1, 1, 0, 1, 0, 1) ; Y = (1, 1, 1, 0, 0, 1). **(10 Marks)**

4 a. Consider the following transaction database for an supermarket Table 4.1. **(12 Marks)**

Customer	Items
C_1	Milk, egg, bread, chip
C_2	Egg, popcorn, chip, beer
C_3	Egg, bread chip
C_4	Milk, egg, bread, popcorn, chip, beer
C_5	Milk, bread, beer
C_6	Egg, bread, beer
C_7	Milk, bread, chip
C_8	Milk, egg, bread, butter, chip
C_9	Milk, egg, butter, chip

Generate all the frequent item sets. Also generate all the strong rules from the frequent itemsets by assuming the minimum support of 30% (atleast three transactions) and minimum confidence of 60%.

b. Write an algorithm to construct FP – tree, with an example. **(08 Marks)**

PART – B

5 a. Give the recursive definition of Hunts algorithm. **(04 Marks)**

b. What are the important characteristics of decision tree induction? **(06 Marks)**

c. Consider a training data set that contains 100 positive examples and 400 negative examples. For each of the following candidate rules.
R_1 : A → + (covers 4 positive & 1 negative examples)
R_2 : B → + (covers 30 positive & 10 negative examples)
R_3 : C → + (covers 100 positive & 90 negative examples).
Determine which is the best and worst candidate rule according to : i) Rule accuracy ii) FOIL's information gain iii) The likelihood ratio statistic. **(10 Marks)**

6 a. Define Error rate. Discuss about the number of methods for estimating the accuracy of a method. **(10 Marks)**
b. List five criteria for evaluating classification methods. Discuss them briefly. **(05 Marks)**
c. Explain how bootstrapping, bagging and boosting improve the accuracy of classification. **(05 Marks)**

7 a. What is Cluster analysis? List the major issues in cluster analysis. **(05 Marks)**
b. Explain the K – means clustering method. **(05 Marks)**
c. Discuss about the hierarchical clustering method in detail. **(10 Marks)**

8 a. Explain the concept of finding similar web pages and finger printing in detail. **(10 Marks)**
b. Write short notes on :
i) Text mining ii) Spatial Data mining. **(10 Marks)**

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10CS/IS765

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

Storage Area Networks

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 data center? Explain key characteristics of data center elements. **(10 Marks)**

b. Explain the various components of disk drive. **(06 Marks)**

c. Consider a disk I/O system in which an I/O request arrives at the rate of 80IOPS. The disk service time is 6 ms. Compute the following:
i) Utilization ii) Response time
iii) Average queue size iv) Time spent by a request in a queue. **(04 Marks)**

2 a. Explain the various techniques on the basis of which RAID levels are defined. **(09 Marks)**

b. An application has 1000 heavy users at a peak of 2 IOPS each and 2000 typical users at a peak of 1 IOPS each, with a read/write ratio of 2:1. It is estimated that the application also experiences an overhead of 10 percent for other workloads. Calculate the IOPS requirement for RAID1, RAID5 and RAID6. **(06 Marks)**

c. With a neat diagram, differentiate between write through and write back cache. **(05 Marks)**

3 a. Explain fibre channel with respect to protocol stack, zoning and login types. **(10 Marks)**

b. Write a note on SCSI-3 architecture. **(10 Marks)**

4 a. What is NAS? Explain the benefits of NAS. **(10 Marks)**

b. Differentiate between Native and Bridged iSCSI connectivity. **(06 Marks)**

c. Write a note on iSCSI PDU. **(04 Marks)**

PART – B

5 a. With neat diagrams, explain the concept of object storage and retrieval in CAS systems. **(10 Marks)**

b. What is storage virtualization? Differentiate between block level and file level virtualization with neat diagrams. **(10 Marks)**

6 a. What is business continuity? Explain BC planning life cycle with a neat diagram. **(10 Marks)**

b. Explain the reasons for which backup is performed. **(10 Marks)**

7 a. Describe the various storage array based local replication technologies. **(10 Marks)**

b. What is storage array based remote replication? Differentiate between synchronous and asynchronous replication mode in it. **(10 Marks)**

8 a. Explain the four security attributes which are under threat. **(04 Marks)**

b. Write a note on risk triad. **(06 Marks)**

c. Describe the categories on the basis of which storage management is classified. **(05 Marks)**

d. Write a note on accessibility monitoring. **(05 Marks)**

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