6E3201

Roll No. _____ Total No of Pages: 3

6E3201

B.Tech VI Sem. (Main & Back) Exam., May/June 2013

Computer Engg.

6CS1 Computer Networks

Common to CS & IT

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1. (a) Describe Routing principle. Explain distance vector routing Algorithm. [8]

(b) Explain flooding and shortest path routing and describe how they are used in link state routing. [8]

OR

Q.1. (a) What is difference between token bucket and leaky bucket algorithm?

(b) Describe all the parameters used in flow specification techniques of congestion control.

(c) What is the difference between open – loop congestion control and closed loop congestion control?

(d) What is four general technique to improve the quality of service. [4x4=16]

UNIT – II

Q.2. (a) Explain the following protocols

(i) RARP Vs 'BOOTP

(ii) POP3 Vs IMAP [10]

(b) Discuss the subnetting and divide class 'C' network into 4 logical networks, if the address was 194.17.68.0 What are the ranges? [6]

OR

Q.2. (a) Explain the difference between IPV4 and IPV6. [5]

(b) An address in a block is given as 73.22.17.25.

(i) Find the total number of address in the block.

(ii) First and last address. [6]

(c) What do you understand by layering and protocol? Explain your answer using the Internet architecture. [5]

UNIT – III

Q.3. (a) Explain the working Go-Back-N protocol and compare it with selective repeat protocol. [8]

(b) Explain three – way hand shaking protocol of connection establishment in transport layer. [8]

OR

Q.3. (a) What is the need of multiplexing in transport layer? Explain two type of multiplexing. [5]

(b) Explain the difference between connection oriented and connection less services. [6]

(c) Discuss the mechanism of flow control. [5]

UNIT – IV

Q.4 (a) Describe the TCP connection management. [8]

(b) A typical sequence of TCP states visited by server side TCP, if TCP round trip time is 30 sec and following acknowledgment come in after 26, 32, 24 msec respectively. What is the new RTT estimate? Use $\phi = .9$ [8]

OR

Q.4. (a) Discuss the possible scenarios for a transport connection over a connection – oriented network layer. [8]

(b) Explain Quality of service for transport layer. [8]

UNIT – V

Q.5. (a) Explain DNS with its messaging scheme and record format. Discuss the resolution process of DNS. [8]

(b) Explain HTTP and its message formats. [4]

(c) Explain architecture of World Wide Web. [4]

OR

Q.5. (a) What is E – mail privacy? Why do we need POP3 or IMAP4 for electronic mail. [8]

(b) Explain different services of application layer. [4]

(c) Write short note on exploiting heterogeneity. [4]

6E3202

Roll No. _____ Total No of Pages: 4

6E3202

B. Tech.VI Sem. (Main & Back) Exam. May/June 2013

Computer Engg.

6CS2 Design and Analysis of Algorithms

Common to CS & IT

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1. (a) Express the following function using asymptotic notations:

(i) $6 * 2^n + n^2$

(ii) $\frac{1}{2} n (n-1)$ [4x2=8]

(b) Apply Stassen's algorithm to compute, using 2x2 matrices, existing the recursion when n = 2

$$\begin{bmatrix} 1 & 0 & 2 & 1 \\ 4 & 1 & 1 & 0 \\ 0 & 1 & 3 & 0 \\ 5 & 0 & 2 & 1 \end{bmatrix} * \begin{bmatrix} 0 & 1 & 0 & 1 \\ 2 & 1 & 0 & 4 \\ 2 & 0 & 1 & 1 \\ 1 & 3 & 5 & 0 \end{bmatrix}$$ [8]

OR

Q.1. (a) Determine the frequency counts for all statements in the following two algorithm segments: [4x2=8]

(i)
```
for i = 1 to n do
    for j = 1 to i do
        for k = 1 to j do
            x = x+1
```

(ii)
```
i = 1
while (i ≤ n) do
{
    x = x+1 ;
    i = i+1 ;
}
```

(b) Find optimal solution to the knapsack (0.1) instance n = 7, m = 15.
$(p_1\ p_2 \ldots\ p_7) = (10, 5, 15, 7, 6, 18, 3)$ and $(w_1\ w_2 \ldots .. w_7) = (2, 3, 5, 7, 1, 4, 1)$ [8]

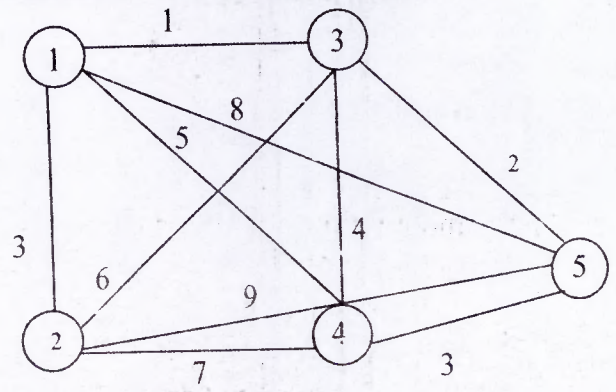
UNIT – II

Q.2. When and how dynamic programming approach is applicable? Discuss matrix chain multiplication with reference to dynamic programming technique and also write a subroutine for matrix chain multiplication and apply it on the following array [16]

30	1	40	10	25

OR

Q.2. (a) Solve the travelling Salesman problem (TSP) for the following graph by using the branch and bound algorithm, the tour must be start from vertex 1 and generate only tour in which 2 is visited before 3. [8]



(b) Let S = { 4, 6, 7, 8} and m = 18 . Find all possible subsets of s that sum to m. Draw the state space tree that is generated [8]

UNIT – III

Q.3. Write the KMP string matching algorithm and also find the prefix function for the following pattern: a b a b b a b a a and implement the algorithm for one step. [16]

OR

Q.3. (a) Using Robin Karp algorithm to solve the feet T = 2359023141526739921 and P = 31415 and modulo q = 13, m = 5 [8]

(b) Solve the assignment problem using Hungarian algorithm for which the following cost matrix [8]

$$\begin{bmatrix} 15 & 5 & 9 & 7 \\ 2 & 13 & 6 & 5 \\ 7 & 8 & 3 & 11 \\ 2 & 4 & 6 & 10 \end{bmatrix}$$

UNIT – IV

Q.4. (a) Explain multi commodity flow problem with some suitable example. [8]

(b) What is flow shop scheduling problem? Schedule two Jobs on 4 machines using flow shop scheduling technique. The time required by each operation of these Jobs is given by following matrix

$$J = \begin{bmatrix} 3 & 0 \\ 0 & 3 \\ 4 & 2 \\ 5 & 2 \end{bmatrix}$$

[8]

OR

Q.4. (a) Explain the concept of randomized algorithm? And give advantages and disadvantages of it? [8]

(b) Explain randomized algorithm for min-cut. [8]

UNIT – V

Q.5. (a) Obtain a nondeterministic algorithm of complexity O(n) to determine whether there is a subset of n number a; , $1 \leq i \leq n$, that sum to m [8]

(b) Give approximation algorithm for vertex cover problem. [8]

OR

Q.5. (a) Define the term P , NP , NP–complete. Give suitable examples of each. [8]

(b) What is Cook's theorem? Explain. [8]

6E3203

Roll No. _____ Total No of Pages: 4

6E3203

B.Tech VI Sem. (Main & Back) Exam. May- 2013

Computer Engg.

6CS 3 Theory of Computation

Common to CS & IT

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

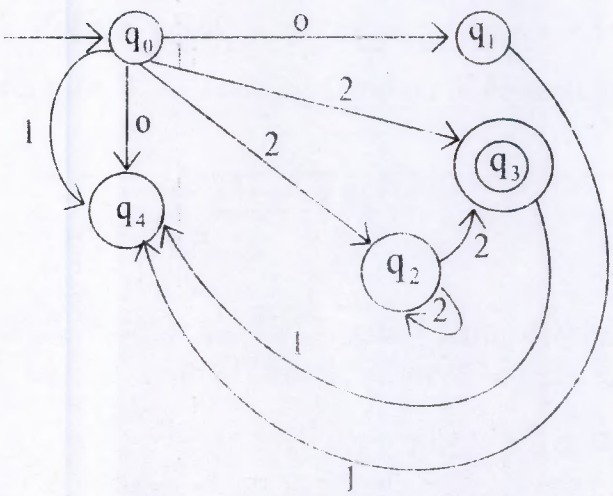
Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

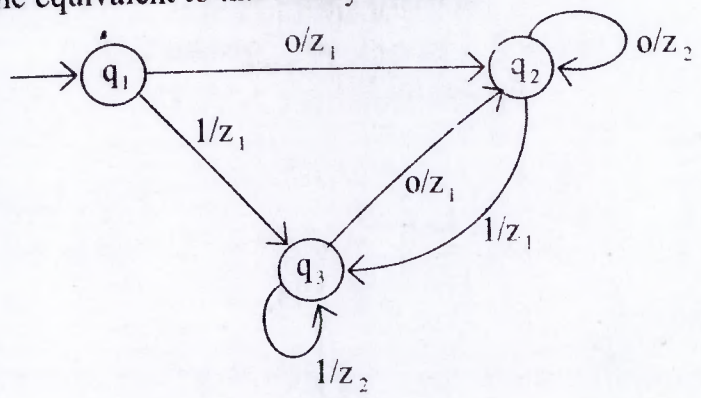
Q1. (a) Explain the procedure for minimization of finite auto mata with example. [8]

(b) Construct a deterministic finite auto mata equivalent to following NDFA. [8]



OR

Q1. (a) Consider a Mealy Machine given by transition diagram. Construct a Moore Machine equivalent to this Mealy Machine. [8]



(b) Construct a transition system which accepts set of string over $\in = \{0, 1\}$ and is with even no. of zeros and even no. of ones. Also find the acceptability of string 110101. [8]

UNIT – II

Q2. (a) Explain Chomsky classification of language with the help of suitable example. [8]

(b) Find the regular grammar corresponding to regular expression (011+1)* (01)* [8]

OR

Q2. (a) Write closure property of regular set. [4]

(b) Show that $L = \{ a^n b^n : n7, 1\}$ is not regular using Mayhill –Nerode theorem. [6]

(c) Explain the application of pumping lemma with an example. [6]

UNIT – III

Q3. (a) Define Chomsky Normal Form (CNF) for context free grammar. Reduce the following grammar to Chomsky Normal Form.

$G = (\{s\}, \{a, b, c\}, \{s \rightarrow a/b/css\}, s)$ [8]

(b) The production of any grammar $\in$ is given by

$S \rightarrow 0B/1A$, $A \rightarrow 0/0S/1AA$

$B \rightarrow 1/1S/0BB$.

For the string 00110101, find leftmost derivation, rightmost derivation and derivation tree. [8]

OR

Q3. (a) How can a pushdown auto mata be constructed for a given language? Explain with example. [8]

(b) Explain the steps involving in conversion from context free grammar to pushdown auto mata with example [8]

UNIT – IV

Q4. (a) Write short note on following:- [8]

(i) Linear bounded auto mata (ii) Universal Turing Machine

(b) Design a Turing Machine M to recognize the language $\{1^n 2^n 3^n / n >,1\}$ [8]

OR

Q4. (a) Explain the following :

(i) Turing Machine (ii) Recursive and recursive enumerable language [8]

(b) Ackermann's function is defined by

$A(0, y) = y+1$, $A(x+1, 0) = A(x, 1)$

$A(x+1, y+1) = A(x, A(x+1, y))$

Compute (i) A(1, 1) (ii) A (2, 1) (iii) A (1, 2) [8]

UNIT – V

Q5. Prove the following closure properties of context sensitive language [4x4=16]

(a) Union (b) Intersection (c) Complementation (d) Transpose

OR

Q5. (a) Which of the following are context sensitive grammar?

Given $V_N = \{S, A, B, D\}$ [16]

$\Sigma = \{0, 1, a, bc\}$, A is start symbol

(a) $A \rightarrow BB$

(b) $A \rightarrow 0B$

(c) $SA \rightarrow S0A$

(d) $SAB \rightarrow S0A1$

(e) $aABbcD \rightarrow abcDbcd$

(f) $01 \rightarrow 10$

(g) $aBA\ bCD \rightarrow abcD\ bcD$

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6E3204

Roll No. _____ Total No of Pages: 3

6E3204

B. Tech VI Sem. (Main & Back) Exam., May. 2013

Computer Engg.

6CS 4 Programming in Java

Common to CS & IT

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1 (a) What do you mean by object oriented programming languages? Explain the features of JAVA that are different from C+ + using suitable examples. [8]

(b) What are relational operators? List the JAVA relational operators with examples. [8]

OR

Q.1 (a) Explain (in short).

1. JAVA byte code
2. JAVA Virtual machine. [4x2=8]

(b) Explain bit wise logical operators and bit shift operators in JAVA using an appropriate example. [8]

UNIT – II

Q.2 (a) What is a class? Explain how the attributes and methods are defined for a class? How do you relate a class and an abject? Illustrate with an example. [8]

(b) Explain the structure of a for loop? How can a for loop be replaced by a while loop and simple if statements? Describe using a suitable example. [8]

OR

Q.2 (a) What is inheritance in JAVA? Explain multiple inheritance with a simple example and relate it with JAVA implementation. [8]

(b) Write short notes on:-

i) Method overriding

ii) Constructors in JAVA

iii) Nested loops

iv) Switch statement. [4x2=8]

UNIT – III

Q.3 (a) Explain JAVA interfaces and their purpose. [8]

(b) Write a program in JAVA to accept an array of strings from the keyboard and arrange them in alphabetical order. [8]

OR

Q.3 (a) How packages are defined in JAVA? How packages are imported in JAVA? Explain using an appropriate example. [8]

(b) Explain various string conversion methods in JAVA using an example. [8]

UNIT – IV

Q.4 (a) What do you mean by exception handling? How exception handling is done using try and catch statements. [8]

(b) Deseribe the usage of throw, throws and finally block using an appropriate example. [8]

OR

Q.4 (a) What is sequential Access text files in JAVA. Explain how these files are created and updated in JAVA using an example. [8]

(b) Write a program that shows that the order of catch blocks is important. If you try to catch a super class exception type before a sub class type, the compiler should generate errors. [8]

UNIT – V

Q.5 (a) Explain paint ( ) and repaint ( ) methods of the component class. [8]

(b) What are threads, why they are needed and how threads enable us to manage concurrent activities? [8]

OR

Q.5 Define the following terns:-

i) Multi threading

ii) Interrupts

iii) Thread states

iv) Sleep and Join [4x4=16]

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6E3205

Roll No. _____ Total No of Pages: 3

6E3205
B. Tech VI Sem. (Main & Back) Exam. May. 2013
Computer Engg.
6CS5 Embedded System Design

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1 (a) What is embedded system? Explain what features should be in an embedded system. [8]

(b) Why system designing is easy using embedded system? [8]

OR

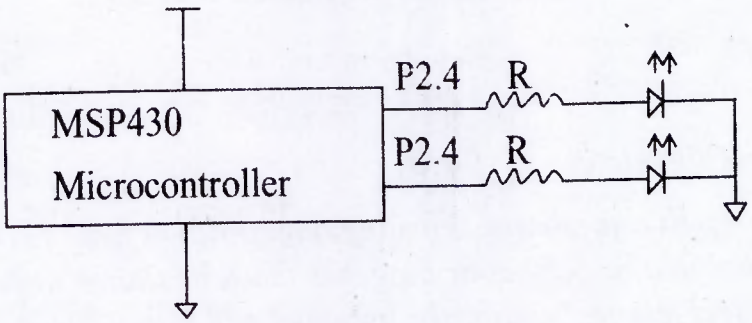
(a) Expiain system- on- chip (SOC) in embedded system. [8]

(b) What do you understand by hardware and software development environment in embedded system? [8]

UNIT – II

Q.2 (a) What is RISC architecture? What features of MSP 430 make it to RISC? [8]

(b) Write a 'C' program for MSP 430 to ON the LED'S connected at P2.4 and P2.3. [8]



OR

(a) What is I/O interfacing? Explain seven segment and stepper motor interfacing with MSP430. [8]

(b) Discuss timers and counters of MSP430. [8]

UNIT – III

Q.3 (a) How ARM processor is better for embedded system development? [8]

(b) Explain current program status register. [8]

OR

(a) Explain pipeline stages in ARM processor. [8]

(b) Explain vector table of ARM processor. [8]

UNIT – IV

Q.4 (a) Explain 8051 flag bits and register banks. [8]

(b) What is indexed addressing mode? Explain by a suitable example. [8]

OR

(a) Explain architecture of 8051. [8]

(b) What is interrupt? Explain interrupt programming. [8]

UNIT – V

Q.5 (a) What are the performance issues that affect the embedded system? [8]

(b) What is sleep mode? [8]

OR

(a) How smoke detector system works? Give suitable block diagram. [8]

(b) How we can optimize CPU power? [8]

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6E3206

Roll No. _____ Total No of Pages: 3

6E3206
B.Tech VI Sem. (Main & Back) Exam., May. 2013
Computer Engg.
6CS6.1 Advance Topics in Operating System
Common to CS & IT

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q1. (a) What is operating system? Explain structure of operating system with suitable diagram. [8]

(b) What are windows threads? Explain how thread approach improves performance of operating system. [8]

OR

Q1. Write short notes on the following:

(a) Java Virtual machine in O.S.

(b) Microkernel for O.S.

(c) Remote Procedure Call

(d) Client Server model [16]

UNIT – II

Q2. (a) What is file system? Explain allocation method in detail. [8]

(b) What is RAID structure? Explain levels of RAID in detail. [8]

OR

Q2. Write short notes on the following:

(a) Virtual file system

(b) Universal serial bus

(c) Disk caching

(d) Boot block in disk management [16]

UNIT – III

Q3. (a) Describe the basic design principles used in Linux operating system. [8]

(b) Explain process management for Linux operating system. How Linux is secure compared to other operating systems. [8]

OR

Q3. Write short notes on the following :

(a) Inter – process communication for Linux O.S.

(b) File System Structure

(c) Kernel Structure for Linux O.S.

(d) Types of Shells in Linux [16]

UNIT – IV

Q4. (a) Explain system component of windows O.S. in detail. [8]

(b) Explain process scheduling in windows O.S. in detail. [8]

OR

Q4. Write short notes on the following:

(a) NTFS file system

(b) Multithreading in Operating Systems

(c) POSIX Subsystem

(d) Disk Mirroring [16]

UNIT – V

Q5. (a) What is multiprocessor operating system? Explain the kernel structure of multiprocessor operating system. [8]

(b) Explain Real Time scheduling in conventional operating system. What are functions of multimedia operating system? [8]

OR

Q5. Write short notes on the following:

(a) Architecture of Multiprocessor O.S.

(b) Palm O.S. and JAVA cards

(c) Video Stream Management

(d) Mobile Operating System [16]

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6E3207

Roll No. _____ Total No of Pages: 3

6E3207

B.Tech. VI Sem. (Main & Back) Exam. May. 2013

Computer Engg.

6CS6.2 Artificial Intelligence

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five question.** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____NIL_____ 2._____NIL_____

UNIT – I

Q.1. (a) Define the production systems. Explain with suitable example. [8]

(b) Differentiate the breath first search and depth first search in detail. [8]

OR

Q.1. (a) What are the controls strategies? Explain any one with example. [8]

(b) Explain the concept of AND – OR Graph search with suitable example. [8]

UNIT – II

Q.2. (a) What is knowledge representation? What are the problems facing representing knowledge? [5]

(b) What is predicate logic? Differentiate propositional and predicate logic. [6]

(c) Explain non monotonic reasoning with suitable example. [5]

OR

Q.2. (a) Explain the close world assumption to deal with incomplete knowledge with a suitable example. [5]

(b) Compare monotonic and non monotonic reasoning. [6]

(c) What are resolution principles? Explain with suitable example. [5]

UNIT – III

Q.3. (a) How fuzzy logic is different from conventional binary logic? Explain it with appropriate example. [5]

(b) Differentiate forward and backward reasoning. [5]

(c) What are the frames? Explain with suitable example. [6]

OR

Q.3. (a) Define the theory of conceptual dependency. Explain with diagram. [6]

(b) Explain Baye's theorem with example. [5]

(c) Explain the concept of semantic net in knowledge representation. [5]

UNIT – IV

Q.4. (a) What are game playing techniques? Explain minimax procedure with example. [5]

(b) What is natural language processing? Explain with example. [5]

(c) Explain the goal stack planning approach for solving the compound goals. [6]

OR

Q.4. (a) What is block world problem? Explain with an example. [6]

(b) What is the need of Alpha – Beta strategy. Explain with example. [5]

(c) What is morphological analysis ? Explain with example. [5]

UNIT – V

Q.5. (a) What do you mean by learning? Explain any one technique which is used in learning? [6]

(b) Define neural network and explain its application. [5]

(c) What is export system? Explain with example. [5]

OR

Q.5. (a) Explain single layer perception model of the neural network. What are its features? [5]

(b) Explain expert system with a suitable example. [6]

(c) Differentiate the "Learning by taking advice" and "Learning by example" with an example. [5]

6E3014

Roll No. _____ Total No of Pages: 4

6E3014

B. Tech VI Sem. (Old Back) Exam., May. 2013

Computer & IT

6ITI Operating Systems (Common with 6CSI)

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1 (a) Differentiate the concept of multiprogramming, multitasking multithreading and multiprocessing. [8]

(b) Explain the essential properties of following operating systems with the example of each :-

i) Multiprogramming operating system

ii) Time sharing operating system

iii) Network operating system

iv) Parallel processing system. [8]

OR

Q.1 (a) Explain micro kernel architecture of operating system. [8]

Q.1 (b) Explain:

i) Short term v/s Long term scheduling.

ii) Turnaround times v/s Response time. [8]

UNIT – II

Q.2 (a) Explain various techniques of deadlock prevention. [8]

(b) Write short note on:

i) Dining philosopher problem

ii) Deadlock Avoidance Techniques. [8]

OR

Q.2 (a) Explain readers writers problem using semaphore when -

i) Readers have priority.

ii) Writers have priority. [8]

UNIT – III

Q.3 (a) Write short note on -

i) Thrashing.

ii) Inverted page table.

ii) Overlaying

iv) Internal v/s external fragmentation. [8]

(b) Consider the following page reference string 1,2,3,4, 2,1,6,5,1,2,2,1,3,7,6,3,2,1,2,3,6. How many page fault would occur for the following page replacement algorithms? Assume 4 page frames are available.

i) LRV

ii) FIFO

iii) Optimal

iv) MRU [8]

OR

Q3. (a) Define page fault and dynamic memory allocation process. Explain Belady's anomaly with example. [8]

(b) A memory system consists of the following hole sizes in order; 10 KB, 4 KB, 20 KB ,18 KB, 7 KB, 9 KB, 12 KB, 15 KB.

Which hole is taken for successive segments requests of

i) 12 KB ii) 10 KB

iii) 9 KB iv) 15 KB

for first fit, best fit and worst fit allocation. [8]

UNIT – IV

Q.4 (a) On a system using demand- paged memory, it takes 120 ns to satisfy a memory request if page is in the memory. If the page in not in the memory, the request takes (on an average) 5ms. What would the page fault rate need to be able to achieve an effective access time of 1μs (micro second)? Assume the system is only running a single process and CPU is idle during page swaps. [8]

(b) Compare and contrast dynamic memory allocation and the allocation of files in secondary storage. [8]

OR

Q.4 (a) Write short note on -

i) Compaction

ii) Externals fragmentation v/s Internal fragmentation

iii) Virtual memory

iv) Demand paging [8]

(b) Consider the following segment table -

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses? [8]

(i) 0, 430 (ii) 1, 10 (iii) 4, 12 (iv) 2, 500

UNIT – V

Q.5 (a) Suppose the head of moving head disk with 200 tracks, numbered 0 to 199 is currently serving a request at track 143 and has just finished a request at track 125, if the queue of request is kept in FIFO.

Order – 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy the requests for following disk scheduling algorithms?

(i) FCFS (ii) SSTF (iii) SCAV (iv) LOOK. [8]

(b) Explain various disk space allocation methods with necessary diagram. [8]

OR

Q.5 (a) Differentiate between flat directory and hierarchical directory structures. [8]

(b) What are different disk scheduling algorisms? Explain the following with suitable example - [8]

(i) FCFS

(ii) SCAN

(iii) C-SCAN

(iv) SSTF

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2 P

6E3017

Roll No. _____ Total No of Pages: 2

6E3017

B. Tech. VI Sem. (Old Back) Exam., May. 2013

Computer Engg.

6CS4 Embedded Systems

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q1. Define embedded systems. Explain the challenges and issues in embedded software development. [16]

OR

Q1. What are the features of embedded systems? Define the role of SOC in embedded system. [16]

UNIT – II

Q2. Explain the micro-controller architecture with suitable diagram. [16]

OR

Q2. What do you mean by embedded operating system? Explain the types of embedded operating systems. [16]

UNIT – III

Q3. What is quality matrix? Explain the 8 bit micro- controllers architecture with suitable diagram. [16]

OR

Q3. How is ARM processer better for embedded system development? Explain vector table in ARM processer. [16]

UNIT – IV

Q4. Explain the embedded database application using energy meter reading and salary survey. [16]

OR

Q4. Explain 8051 Flag and Register Banks. Explain the process of controlling an application from the RT Linux System. [16]

UNIT – V

Q5. Explain the tools for building embedded system in detail. What is sleep Mode?[16]

OR

Q5. Explain the working of smoke detector system with a suitable block diagram. What is the working of sensor unit?

6E3018

Roll No. _____ Total No of Pages: 4

6E3018

B. Tech VI Sem. (Old Back) Exam., May. 2013

Computer Engg.

6CS5 Theory of Computation

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1. (a) What is the difference between Deterministic and Non-Deterministic finite automaton? Construct a Non Deterministic finite automaton accepting the set of all strings over {a, b} ending in aba. [8]

(b) $M = (\{q_1, q_2, q_3\}, \{0,1\}, \delta, q_1, \{q_3\})$ is a Non Deterministic finite automaton where δ is given by

$\delta(q_1,0) = \{q_2, q_3\}$ $\quad \delta(q_1,1) = \{q_1\}$

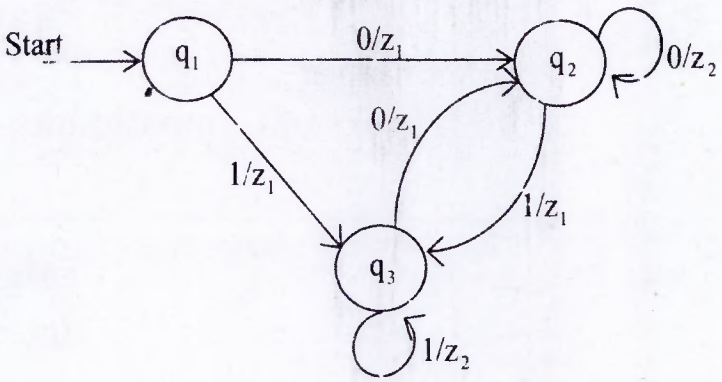
$\delta(q_2,0) = \{q_1, q_2\}$ $\quad \delta(q_2,1) = \varphi$

$\delta(q_3,0) = \{q_2\}$ $\quad \delta(q_3,1) = \{q_1\ q_2\}$

Construct an equivalent DFA. [8]

OR

Q.1. (a) Define the MEALY and MOORE Models. Construct the MOORE machine equivalent to MEALY machine given in figure below. [8]



(b) What are the various applications of Finite Automata and Regular Expression? Explain in detail. [8]

UNIT – II

Q.2. (a) Explain the Chomsky classification of languages. Give examples of each type (0-3). [8]

(b) Are the following true or false? Support your answer by giving proofs or counter examples

(i) If $L_1 \cup L_2$ is regular and L_1 is regular, then L_2 is regular.

(ii) If $L_1 L_2$ is regular and L_1 is regular then L_2 is regular.

(iii) If L^* is regular, then L is regular. [8]

OR

Q.2. (a) Prove $(1+00^*1)+(1+00^*1)(0+10^*1)^*(0+10^*1) = 0^*1(0+10^*1)^*$ [4]

(b) Construct a transition system corresponding to the regular expression

(i) $(ab+c^*)^*b$ (ii) $a+bb+bab^*a$ [4]

(c) Show that $\{a^n b^m \mid 0 < n < m\}$ is not regular. [8]

UNIT – III

Q.3. (a) Show that grammar

$S \rightarrow a \mid abSb \mid aAb,\ A \rightarrow bS \mid aAAb$ is ambiguous [6]

(b) Reduce the following grammar to Greibach normal form -

$S \rightarrow AB, A \rightarrow BSB, A \rightarrow BB, B \rightarrow aAb, B \rightarrow a, A \rightarrow b$. [10]

OR

Q.3. Construct a Push Down Automata accepting $\{a^n b^m a^n \mid m,n,\geq 1\}$ by null store. Construct the corresponding content free grammar accepting the same set. [16]

UNIT – IV

Q.4. (a) Explain the Turing Machine Model with the help of diagram. [8]

(b) Design a Turing Machine over {1, b} which can compute concatenation function over $\sum = \{1\}$. If a pair of words $\{w_1, w_2\}$ is the input the output has to be w_1w_2.

[8]

OR

Q.4. (a) Design a Turing Machine M to recognize the language $\{1^n 2^n 3^n \mid n \geq\}$. [8]

(b) Write short note on foliowing

(i) Universal Turing Machine

(ii) Rice Theorems [4+4=8]

UNIT – V

Q.5. Find the grammar generating the set accepted by linear bounded Automaton M whose transition table is given [16]

Present State	Tape input Symbols			
	¢	$	0	1
$\rightarrow q_1$	¢ Rq_1		1 L q_2	0R q_2
q_2	¢ Rq_4		1 R q_3	1 L q_1
q_3		$ L q_1	1 R q_3	1R q_3
(q_4)		Halt	0 L q_4	0R q_4

OR

Q.5. (a) Explain the working of Linear Bounded Automata. What is the difference between Turing Machine and Linear Bounded Automaton? [8]

(b) Explain the properties of context sensitive language. [8]

3/1

6E3021

Roll No. _____ Total No of Pages: 3

6E3021

B.Tech.VI Sem. (Old Back) Exam. May/June 2013

Computer & IT

· 6IT4 Web Technology

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1. (a) What is technology advance and its impact on web team? [8]

(b) What is cyber law? Explain cyber law in India? [8]

OR

Q.1. (a) What are the desired characteristics of a web projects? [8]

(b) Explain various roles in a web team? [8]

UNIT – II

Q.2. (a) Explain the concept of image map and hot spot. Illustrate it with some suitable HTML Code. [8]

(b) What are the different levels of CSS style sheets? [8]

OR

Q.2. (a) What is XML? Give advantage and uses of XML. [8]

(b) What is DOM? Differentiate between DOM and SAX. [8]

UNIT – III

Q.3. (a) Explain Java Bean API. Write a simple bean program [8]

(b) Explain the concept of:

(i) Jar files

(ii) Manifest files [4x2]

OR

Q.3. (a) What is JDBC? Explain the JDBC Architecture. [8]

(b) Explain Multi-tier application? Develop a multi-tier application for Library management system. [8]

UNIT – IV

Q.4. (a) Explain the life cycle of JSP. Write its advantages? [8]

(b) Describe the process of testing Tomcat server. [8]

OR

Q.4. (a) What do you mean by directive element? Explain it with example. [8]

(b) How to handle method and variable in JSP? [8]

UNIT – V

Q.5. (a) Explain how JBDC perform mapping between JAVA and SQL data type. [8]

(b) What is struts? Explain its MVC architecture. [8]

OR

Q.5. (a) Write short note on:

(i) Javax.sql.* package in detail. [8]

(ii) Error handling and debugging in JSP [8]

6E3022

Roll No. _____ Total No of Pages: 3

6E3022

B.Tech.VI Sem. Back Exam., Old Scheme May/June. 2013

IT

6IT5 Optical Communication

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1._____ 2._____

UNIT – I

Q.1. (a) What are the criteria used for selecting materials for designing optical fiber. Classify optical fiber on the basis of materials used. [6]

(b) Describe with schematic diagrams, the necessary steps involved in fiber fabrication. [10]

OR

Q.1. Explain the following:

(a) Made field diameter

(b) Optical fiber modes and configuration

(c) Numerical Aperture

(d) Cut off wavelength for single mode operation. [4x4]

UNIT – II

Q.2. (a) Explain the losses that occur during power launching from source to fiber. Also for fiber to fiber coupling. [8]

(b) A planar LED is fabricated from GaAs which has a ref. index 3.6. Calculate the optical power emitted into air as a percentage of the internal optical power for the device when the transmission factor at the crystal – air interface is 0.68. [8]

OR

Q.2. (a) Derive the relation between quantum efficiency and responsivity of a photodiode. Explain cut off wavelength. [8]

(b) Explain Avalanche photodiode. Derive the relation for excess noise due to Avalanche effect. [8]

UNIT – III

Q.3. (a) Explain the causes of Attenuation in optical fiber. What is the effect of non linear scattering? [10]

(b) Describe the design of dispersion shifted and dispersion flattened fiber. [6]

OR

Q.3. (a) Derive mathematical relation to find out the parameters that can be controlled to minimize the material and wave guide dispersion. [10]

(b) Explain the role of graded index fiber in dispersion characteristic. [6]

UNIT – IV

Q.4. (a) Explain modulation techniques for Homodyne and Heterodyne systems. [8]

(b) Explain line codes used in optical fiber system. [8]

OR

Q.4. (a) Explain key system requirements in optical fiber link design. [8]

(b) Describe link power budget and rise time budget equations in digital link design using optical fiber. [8]

UNIT – V

Q.5. (a) Compare semiconductor Amplifier and EDFA. Give their applications. [8]

(b) Explain the role of wavelength division multiplexing in optical communication system. [8]

OR

Q.5. Describe the following:

(a) FDDI

(b) SONET

(c) Ring topology

(d) Photonic switching [4x4]

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6E3209

Roll No. _____ Total No of Pages: 4

6E3209

B. Tech. VI Sem. (Main/Back) Exam., May/June 2013

Information Tech.

61T5 Information Theory Coding

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1._____ 2._____

UNIT – I

Q.1. (a) Prove that the entropy for a discrete source is maximum that the O/P symbols are equiprobable. [8]

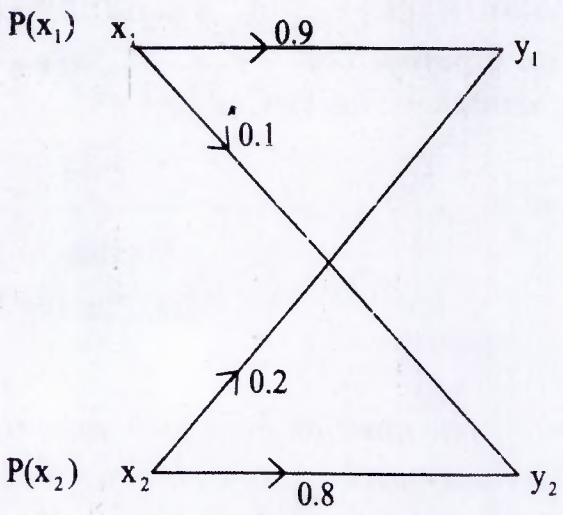
(b) Given the joint probability matrix.

$$[P(x,y)] = \begin{bmatrix} \frac{3}{40} & \frac{1}{40} & \frac{1}{40} \\ \frac{1}{20} & \frac{3}{20} & \frac{1}{20} \\ \frac{1}{8} & \frac{1}{8} & \frac{1}{8} \end{bmatrix}$$

Evaluate H (X), H (Y), and I(X, Y) [8]

OR

Q.1. (a) Consider a binary channel shown in below. [8]



(i) Find channel matrix of channel

(ii) Find P (y_1) & P (y_2) When P (x_1) = P (x_2) = 0.5

(b) Show that I (X, Y) = H (X) + H (Y) – H (X, Y) [8]

UNIT – II

Q.2. (a) Discuss Shannon – Hartley channel capacity theorem. Also discuss the utility of orthogonal signal to attain Shannon's limit. [8]

(b) Discuss in detail about "Huffman coding". [8]

OR

Q.2. (a) What is "Lempel – Ziv" Coding. [8]

(b) A transmission channel has a B.W. of 4 KHz and signal to noise power ratio is 31. [8]

(i) How much should the B.W. be in order to have the same channel capacity if S/N ratio is reduce to 15?

(ii) What will be the signal power require of the B.W. is reduce to 3KHz for the source channel capacity?

UNIT – III

Q.3. The parity check matrix of a particular (7, 4) liner block code is expressed as:

$$[H] = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

(a) Obtain the generator matrix (G)

(b) List all the code vectors

(c) What will be the minimum distance between code vectors?

(d) How many errors can be detected? How many errors can be corrected? [16]

OR

Q.3. The parity check matrix of (7, 4) Hamming code is Expressed as under:

$$[H] = \left[\begin{array}{ccccc:ccc} 1 & 1 & 1 & 0 & : & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & : & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 & : & 0 & 0 & 1 \end{array}\right]_{3 \times 7}$$

Evaluate the syndrome vector for single bit errors. [16]

UNIT – IV

Q.4. (a) What is cyclic code? Discuss their Properties. [8]

(b) Construct a Galois field GF (2^4) or G(16) as an extension of the Galois field GF(2). [8]

OR

Q.4. A (15, 5) linear cyclic code has a generator Polynomial:

$$g(x) = (1 + x + x^2 + x^4 + x^5 + x^8 + x^{10})$$

(a) Draw block diagram of an encoder and syndrome calculate for this code.

(b) Find the code Polynomial for the message Polynomial $D(x) = 1 + x^2 + x^4$ (in a systematic form).

(c) Is $v(x) = 1 + x^4 + x^6 + x^8 + x^{14}$ a code Polynomial? If not, find the syndrome of v(x).

[16]

UNIT – V

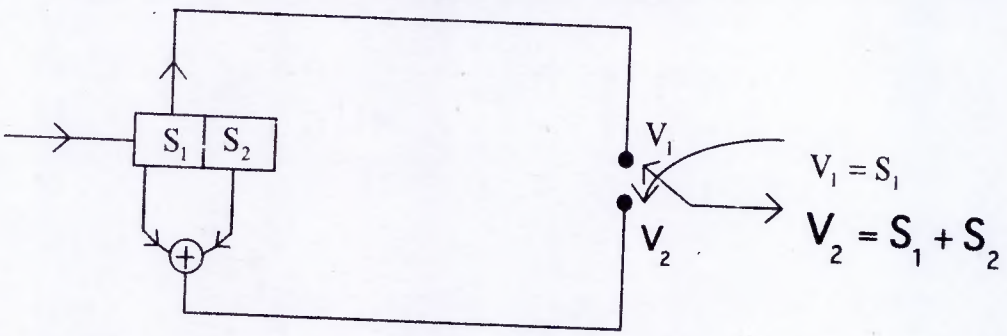
Q.5. (a) What are code tree, code trellis and state diagram for convolution encoders? [8]

(b) Explain the viterbi algorithm. [8]

OR

Q.5. (a) Explain maximum likehood decoding of convolution code. [8]

(b) Consider the convolutional encoder shown in figure:



(i) Sketch the state diagram, the three diagram and the trellis diagram for the above convolutional encoder.

(ii) Determine the output codeword for the input data sequent d = (101). [8]
