6E6021

6E6021

6E6021
B. Tech. VI-Sem. (Main/Back) Exam., April/May-2016
Computer Science & Engineering
6CS1A Computer Networks
CS, IT

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

Min. Passing Marks (Main & Back): 26

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 may 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. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) What do you understand by routing? Explain the classification of routing algorithms. [6]

(b) Discuss shortest path routing algorithm with help of suitable example. [10]

OR

Q.1 (a) Discuss the reason of congestion in a network. Also discuss Leaky bucket and Token bucket algorithms in detail. [8]

(b) Contrast between distance vector and link state routing after discussing both. [8]

UNIT-II

Q.2 (a) State the concept of tunneling. Under what practical circumstances it is used? Explain by suitable example. [8]

(b) Discuss classes of IPV4. Also explain provision of multicast and broadcast support in IPV4. [8]

OR

Q.2 Write short note on following: [8×2=16]

(a) IPV4 Vs IPV6

(b) Mobile IP

UNIT-III

Q.3 (a) Write a technical note on flow control and buffering. [8]

(b) Explain the need of multiplexing at transport layer. Describe the multiplexing and De-multiplexing with help of suitable diagram. [8]

OR

Q.3 (a) Differentiate between a reliable and lossy channel. Also derive relation between channel and bit errors. (Take your own assumptions.) [8]

(b) Describe UDP protocol and its application in DNS. [8]

UNIT-IV

Q.4 Draw and explain TCP Header and segment structure. [16]

OR

Q.4 (a) Discuss the TCP connection establishment and release. [8]

(b) Write a technical note on TCP congestion control. [8]

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UNIT-V

Q.5 (a) What is Network Security? Explain the principles of Network Security. Also discuss the various challenges in implementation of security in computer network.

[8]

(b) Draw and explain Domain Name System (DNS) record structure.

[8]

OR

Q.5 Write short note on:-

(a) World Wide Web (WWW)

[8]

(b) File Transfer Protocol (FTP)

[8]

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 may 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. NIL_____

2. NIL_____

UNIT-I

Q.1 (a) Solve the recurrence relation for time complexity : [4]

$T(n) = 2$ if n = 2

$T(n) = 2T(n/2) + 3n$ if n > 2

  (b) Explain various types of asymptotic notations in detail. [4]

  (c) Illustrate the operation of merge sort on following array 10, 20, 5, 23, 45, 34, 12.

     Also write the algorithm & its complexity. [8]

OR

Q.1 (a) Explain Stassen's matrix multiplication & derive its complexity also? Justify how is it better than ordinary matrix multiplication. [8]

(b) Explain Prim's algorithm for finding minimum spanning tree. [8]

UNIT-II

Q.2 (a) What is Dynamic programming? How it gives the optimal solution? Consider n =3, consider M =6 , (w1, w2, w3) = (2, 3, 3)

$$(p1, p2, p3) = (1, 2, 4)$$

Find optimal solution for given knapsack problem. [8]

(b) Explain Matrix chain multiplication. Also find the parenthesization for the following matrix A1 =15×10, A2 = 10×20, A3 = 20×25 [8]

OR

Q.2 (a) Suggest an approximation algorithm for traveling sales person problems using minimum spanning tree algorithm. Assume that the cost function satisfies the triangle inequality. [8]

(b) What is backtracking? Explain 8-queens problem, also write algorithm for the same. [8]

UNIT-III

Q.3 (a) Explain Naïve string matching algorithm using suitable example. [8]

(b) Solve the given assignment problem by branch and bound method. [8]

	Job 1	Job 2	Job 3	Job 4
Person 1	9	2	7	8
Person 1	6	4	3	7
Person 1	5	8	1	8
Person 1	7	6	2	4

OR

Q.3 (a) Explain Boyer Moore Algorithms with suitable example. [8]

(b) Explain the Quadratic Assignment Problem with suitable example. [8]

UNIT-IV

Q.4 (a) What do you mean by randomized algorithms. Explain Las Vegas algorithms and Monte Carlo algorithms with suitable examples. [10]

(b) Explain Flow shop scheduling with suitable example. [6]

OR

Q.4 (a) Describe problem definition of Multicommodity flow in the network. State and prove the Ford Fulkerson's theorem. [8]

(b) Explain Randomized min cut theorem with suitable example. [8]

UNIT-V

Q.5 (a) Explain NP Hard and NP Complete with example. [8]

(b) Explain the Cook's theorem with suitable example. [8]

OR

Q.5 (a) Prove that Hamilton cycle problem is NP complete. [8]

(b) Explain Approximation Algorithms for Vertex and Set Cover problem. [8]

6E6023

6E6023
B. Tech. VI-Sem. (Main/Back) Exam., April/May-2016
Computer Science
6CS3A Theory of Computation
Common for IT

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks (Main & Back): 26

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 may 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. NIL _____

2. NIL _____

UNIT-I

Q.1 (a) M = ({q1, q2, q3}, {0, 1}, δ, q1, {q3}) is nondeterministic finite automaton,

where δ is given by [8]

δ (q1, 0) = {q2, q3}, δ (q1, 1) = {q1}
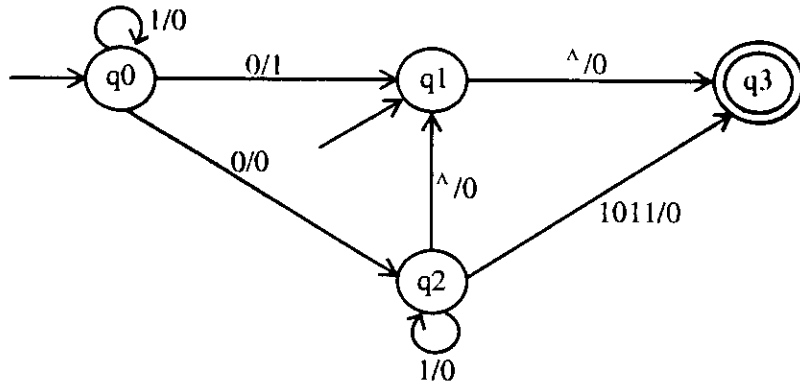
δ (q2, 0) = {q1, q2}, δ (q2, 1) = ϕ

δ (q3, 0) = {q2} δ (q3, 1) = {q1, q2}

Construct an equivalent DFA.

(b) Explain the model of a discrete automaton, also describe its characteristics. [8]

OR

Q.1 (a) Describe the block diagram of a finite automaton. Consider the transition system given below.

Determine the initial states, the final state and the acceptability of 101011 and 111010. [8]

(b) Prove that for any transition function δ and for any two input string x and y.

δ (q, xy) = δ (δ (q, x), y) [8]

UNIT-II

Q.2 (a) If G = ({S}, {0, 1}, {S → 0 SI, S → ∧}, S), find L (G) with explanation. [8]

(b) Find the language generated by the grammar S → AB, A → A 1/0, B → 2B/3. Can the above language be generated by a grammar of higher type? [8]

OR

Q.2 (a) Prove that :

(1 + 00 * 1) + (1 + 00 * 1) (0 + 10 * 1) * (0 + 10 * 1) = 0 * 1 (0 + 10 * 1)* [8]

(b) Consider a finite automaton, with ∧ - moves, given in a figure

Obtain an equivalent automaton without ∧ - moves. [8]
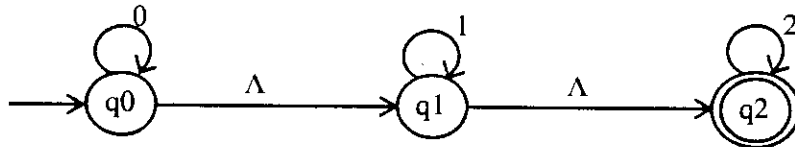
UNIT-III

Q.3 Define pushdown automaton model and its role, also illustrate the move relation in details. [16]

OR

Q.3 (a) Consider the following productions: [8]

$$S \to a B \mid b A$$

$$A \to a S \mid b A A \mid a$$

$$B \to b S \mid a B B \mid b$$

for the string a a a b b a b b b a, find

(i) the leftmost derivation,

(ii) the rightmost derivation, and

(iii) the parse tree

(b) Reduce the following grammars in Chomsky normal form: [8]

(i) $S \to 1 A \mid 0B, A \to 1 AA \mid 0S \mid 0, B \to 0BB \mid 1S \mid 1$

(ii) $G = (\{S\}, \{a, b, c\}, \{S \to a \mid b \mid cSS\}, S)$

(iii) $S \to a b S b \mid a \mid a A b, A \to b S \mid a A A b$

UNIT-IV

Q.4 (a) Explain Turing machine model and its working functions. [8]

(b) Consider the TM description below. Draw the computation sequence of the input string 00. [8]

Present State	Tape Symbol		
	b	0	1
→ q1	1 Lq2	0 Rq1	
q2	b Rq3	0 Lq2	1 Lq2
q3		b Rq4	b Rq5
q4	0 Rq5	0 Rq4	1 Rq4
q5	0 Lq2		

OR

Q.4 Design a Truing machine over {1, b} which can compute a concatenation function over $\Sigma = \{1\}$.

If a pair of words (w1, w2) is the input, the output has to be w1 w2.   [16]

UNIT-V

Q.5 Explain the model of Linear bounded automaton, also explain the relationship between LBA and context sensitive languages.   [16]

OR

Q.5 Write short note on (any 2):-   [8×2=16]

(a) Chomsky Hierarchy of languages

(b) Properties of LBA

(c) Context sensitive languages

6E6024

6E6024

B. Tech. VI-Sem. (Main/Back) Exam., April/May-2016
Computer Science
6CS4A Computer Graphics and Multimedia Techniques

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

Min. Passing Marks (Main & Back): 26

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 may 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. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) Explain the following terms in context of display devices:

     (i)   resolution   [2]

     (ii)   flickering   [2]

     (iii)   interlacing   [2]

     (iv)   refreshing   [2]

     (b) Go through steps of Bresenham's line drawring algorithm for the line segment between end points (21, 12) to (29, 16).   [8]

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OR

Q.1 (a) Differentiate between Raster and random scan display devices. [6]

(b) Explain beam penetration method. [6]

(c) What is importance of 8 – way symmetry in scan conversion of circle? [4]

UNIT-II

Q.2 (a) Derive composite transformation matrix of translation followed by reflection. [8]

(b) Describe Cohen – Sutherland line clipping algorithm. [8]

OR

Q.2 (a) Differentiate between boundary fill and flood fill techniques. [6]

(b) Provide an example of inverse transformation in homogeneous coordinate system. [6]

(c) Discuss issues related to polygon clipping. [4]

UNIT-III

Q.3 (a) How is image space method different from object space method? [4]

(b) Discuss properties of Bezier curves. [8]

(c) What are the issues related to hidden surfaces? [4]

OR

Q.3 (a) Illustrate depth buffer method with diagrams. [8]

(b) Discuss properties of B-spline curves. [8]

UNIT-IV

Q.4 (a) Discuss following color models -

(i) RGB [4]

(ii) YIQ [4]

(iii) CMY [4]

(b) Describe Phong shading. [4]

OR

Q.4 (a) What are the various aspects of illumination of objects? [8]

(b) Describe Gourand shading. [4]

(c) What is HSV color model? [4]

UNIT-V

Q.5 Write short notes on any two - [8×2=16]

(a) Multimedia components

(b) Steps of animation

(c) Animation techniques

(d) Multimedia techniques

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6E6025

B.Tech. VI-Sem. (Main/Back) Exam., April/May-2016
Computer Science & Engineering
6CS5A Embedded System Design

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks (Main & Back): 26

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 may 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.NIL_____   2. NIL_____

UNIT-I

Q.1 (a) What is embedded system? What are the hardware needs before designing an embedded system? [8]

(b) What is the difference between an embedded system and a general computing system? [8]

OR

Q.1 (a) What are programmable logic devices? Also explain field programmable gate arrays and complete programmable logic devices. [8]

(b) What are the advantages of programmable logic devises over fixed logic devices? [8]

UNIT-II

Q.2 (a) Explain level triggered and edge triggered interrupts. Which one of these interrupts in generally recommended for interrupt signals that are very short or very long? [8]

(b) What are interrupt service routines (ISRs) and how ISRs handle a interrupt? [8]

OR

Q.2 (a) What is context and why context saving occurs in a multitasking system? [8]

(b) What operations are performed by CPU for solving shared data problems? [8]

UNIT-III

Q.3 (a) What is real time operating system? Categorizeit, also write down its benefits. [8]

(b) Describe the various states of tasks with respect to RTOS. Also explain the role of timer function in RTOS. [8]

OR

Q.3 (a) Write short note on the following: - [8]

(i) Scheduler

(ii) Reentrancy.

(b) How inter task communication process is done by mailboxes and pipes? [8]

UNIT-IV

Q.4 (a) Briefly describe the steps involved in embedded system development. [8]

(b) Explain the parameters of real time task. Also enlist the types of task scheduling in RTOS. [8]

OR

Q.4 (a) Write short note on the following: -   [8]

(i) QNX

(ii) RT LINUX

(b) What is real time system? Differentiate hard real time system and soft real time system.   [8]

UNIT-V

Q.5 (a) Explain the process of software code development in embedded system.   [8]

(b) Explain the version techniques by which the code in uploaded to target board. [8]

OR

Q.5 Write short note on the followings: -   [16]

(a) Logic Analyzer

(b) In circuit Emulator (ICE)

(c) Monitor

(d) Issues with traditional Emulation.

Roll No. _____   Total No of Pages: 3

6E6026

6E6026

B. Tech. VI-Sem. (Main/Back) Exam., April/May-2016
Computer Science & Engineering
6CS6.1A Advance Topics in Operating Systems
CS, IT

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

Min. Passing Marks (Main & Back): 26

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 may 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. <u>NIL</u> _____   2. <u>NIL</u> _____

UNIT-I

Q.1 (a) Give brief introduction of four advanced operating systems.   [8]

(b) Discuss clock synchronization in distributed system of agreement algorithm. [8]

OR

Q.1 (a) Give account of three synchronization problems.   [8]

(b) Describe timestamp base concurrency control algorithm.   [8]

UNIT-II

Q.2 (a) Describe model of deadlock each with example. [8]

(b) What are the advantages & disadvantages of distributed shared memory? [8]

OR

Q.2 (a) Write short notes on RAID. [8]

(b) WSN on security issues & method in Advance Operating System. [8]

UNIT-III

Q.3 (a) Explain in detail Kernel structure of LINUX operating system. [8]

(b) WSN on process scheduling in LINUX operating system. [8]

OR

Q.3 (a) Explain the network file system of LINUX in detail. [8]

(b) Write short note on security system of LINUX O.S. [8]

UNIT-IV

Q.4 (a) Explain the FAT & NTFS in context with windows OS. [8]

(b) Explain the Kernel structure of windows OS. [8]

OR

Q.4 (a) Write short note on POSIX. [8]

(b) Write short note on process scheduling in windows. [8]

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UNIT-V

Q.5 (a) Write short note on Compression Technique in multimedia operating system. [8]

(b) Write short note on Real Time scheduling in multimedia operating system. [8]

OR

Q.5 (a) Explain real time scheduling in multimedia operating system. [8]

(b) Write short note on disk scheduling algo in multimedia operating system. [8]

6E6095

6E6095
B. Tech. VI-Sem. (Main & Back) Exam., April/May-2016
Information Technology
6IT5A Information Theory and Coding

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks (Main & Back): 26

*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 may 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. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) Two binary channel are connected is cascade as shown is figure below
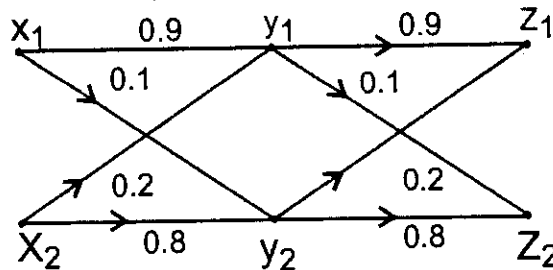
(i) Find the ones all channel matrix of the resultant channel, and draw the resultant equivalent channel diagram.   [4]

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(ii) Find P (z_1) and P (z_2) when P (x_1) = P (x_2) = 0.5 [4]

(b) Define channel and also explain its types. [8]

OR

Q.1 (a) Define the following

(i) Information [2]

(ii) Entropy [2]

(iii) Information Rate [2]

(iv) Joint entropy [2]

(b) A discrete source units one of five symbols once every millisecond with probabilities 1/2, 1/4 , 1/8, 1/16 and 1/16 respectively. Determine the source entropy and information rate. [8]

UNIT-II

Q.2 (a) A DMS X has four symbols x_1, x_2, x_3 and x_4 with P (x_1) = 1/2, P(x_2) = ¼ and P(x_3) = P(x_4) = 1/8. Construct a shannon fano code for X; show that this code has the optimum property that η_i = L (x_i) and the code efficiency is 100 percent. [8]

(b) Explain Lempel – Ziv algorithm with example. [8]

OR

Q.2 Determine the Huffman code for the following message with their [16]

x_1	x_2	x_3	x_4	x_5	x_6	x_7
0.05	0.15	0.2	0.05	0.15	0.3	0.1

and also find the average code word length, entropy, code efficiency. Compare the result with entropy.

UNIT-III

Q.3 (a) What do you mean by linear block code? Explain. [4]

(b) Given a (7, 4) linear block code whose generator matrix is given by [12]

$$G \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

(i) Find all the code words

(ii) Find the parity check matrix.

OR

Q.3 (a) Differentiate between systematic and non- systematic codes. Also give suitable examples. [8]

(b) Explain the Repeated codes with an example. [8]

UNIT-IV

Q.4 (a) For systematic (7, 4) cyclic code, determine the generator matrix and parity check matrix. [12]

Given : $G(P) = P^3 + P + 1$

(b) Write a short note on Galois field polynomial. [4]

OR

Q.4 (a) Give block diagram and explain the operation of syndrome calculator for cyclic codes. [8]

(b) Design encoder and decoder for cyclic codes with block diagram. [8]

UNIT-V

Q.5 (a) Explain the viterbi algorithm and sequential decoding of convolutional codes. [8]

(b) What are code tree, code trellis and state diagram for convolutional encoders? [8]

OR

Q.5 (a) Explain the difference between convolutional codes and block codes with example. [6]

(b) Draw the state diagram, the tree diagram and trellis diagram for the convolutional encoders of figure below. [5]

(c) Find the free distances of this convolutioonal code. [5]

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6E6094

6E6094

B. Tech. VI-Sem. (Back) Exam., April/May-2016
Computer Science & Engineering
6CS4 (O) Programming in Java
CS, IT

Time: 3 Hours   Maximum Marks: 80
                                        Min. Passing Marks (Back): 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 may 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. NIL _____   2. NIL _____

UNIT-I

Q.1 What is difference between object oriented programming and object based programming language?   [16]

OR

Q.1 What dines Java its 'write once and run anywhere' natures?   [16]

UNIT-II

Q.2 What is difference between states method and instance method by giving an example.   [16]

OR

Q.2 What are control statement in Java while explaining usage of 'break' statement. [16]

UNIT-III

Q.3 What is difference between abstract class and an interface? [16]

OR

Q.3 Define 'String buffer' and 'String' classes with an example. [16]

UNIT-IV

Q.4 Write down a skeleton of exception handling mechanism in Java. [16]

OR

Q.4 Describe file streams in Java while explaining serialization. [16]

UNIT-V

Q.5 Write short notes on any following two: [16]

    (a) Java Applet V/S Application

    (b) Process and Threads

    (c) Overloading and Overriding

    (d) Classpath and Packages