**Roll No.** _____    Total No of Pages: 4

**6E3201**

# B. Tech. VI Sem. (Main & Back) Exam., May/June-2014
## Computer Engineering
## 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 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.*

1. _____    2. _____

# UNIT-I

Q.1 (a) Explain optimality principle. How the principle is utilized in designing routing algorithms? [2]

(b) How connection oriented and connection less services are implemented in network layer? Discuss. [4]

(c) When flooding is used for routing, the first pocket arriving at the destination will reach through the optimal path. Justify the statement. [4]

(d) What measures are taken to control population and life of link state packets in link state routing algorithm? Explain. [6]

## OR

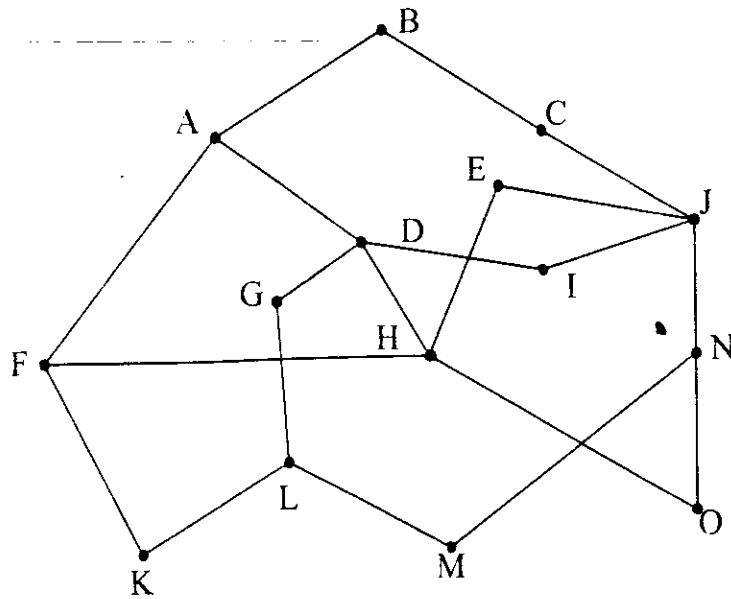Q.1 (a) For the fig. (i) construct a sink tree rooted at B [6]



Fig. (1)

(b) For the sink tree computed in part (a), compute the number of packets generated by a broadcast from B using reverse path forwarding.

# UNIT- II

Q.2 (a) In Internet Protocol (IP), how fragmentation is implemented? Explain the fragmentation and fields used in re-assembly at the destination. [10]

(b) What is subnetting? Why it is used? Explain the process of routing packets in a network with subnets. [6]

## OR

Q.2 A router has the following CIDR entries in its routing table.

| Address/mask | next hop | |
|---|---|---|
| 135.46.56.0/22 | Interface | 0 |
| 135.46.60.0/22 | Interface | 1 |
| 192.53.40.0/23 | Router | 1 |
| Default | Router | 2 |

For each of the following IP addresses, what does the router do if a packet with that address arrives?

    (i)   135.46.63.10

    (ii)  135.46.57.14

    (iii) 135.46.52.2

    (iv)  192.53.40.7

    (v)   192.53.56.7

Show all calculations [16]

# UNIT-III

Q.3 (a) Show that 3-way handshake protocol used for connection establishment works in the presence / occurrence of (i) duplicates and (ii) loss acknowledgements. [8]

(b) RTP is used to transmit CD Quality audio, which makes a pair of 16-bit samples 44,100 times/ sec, one sample for each of stereo channel. How many packets per second must RTP transmit? [8]

## OR

Q.3 (a) A TCP is sending full windows of 65535 bytes over a 1-Gbps channel that has 10 msec. one way delay. What is the maximum throughput achievable? What is the line efficiency? [8]

(b) Explain differences in using sliding window protocol at transport layer and at data link layer. [4]

(c) A client sends a 128- byte request to a server located 1000m away over a 1-Gbps optical link. What is the efficiency of the line during RPC? [4]

*196*

# UNIT-IV

Q.4 (a) Explain the significance of following control bits in TCP: [8]

  (i)   SYN

  (ii)  ACK

  (iii) RST

  (iv)  FIN

  (b) If the TCP round trip time (RTT), is currently set 30 msec. and the following acknowledgements come in after 26, 32, and 24 msec. respectively, what is the RTT estimate using Jacobson algorithm? Assume suitable value for $\alpha$ (alpha).

[8]

## OR

Q.4 (a) Suppose that the TCP congestion window is set to 18 KB and timeout occurs. How big will the window be if the next four transmission bursts are all successful? Assume that the maximum segment size is 1 KB. [8]

  (b) What is "slow start"? How does it help in dealing with congestion? Explain. [8]

# UNIT-V

Q.5 (a) In DNS, can a single host have (i) multiple hostnames and (ii) multiple addresses? How the records are organized in such cases? [8]

  (b) Differentiate between (i) iterative and (ii) recursive DNS query. Explain both.

[8]

## OR

Q.5 (a) What is the role of cookies in World Wide Web? [8]

  (b) Write short notes on the following: [8]

  (i)   Performance enhancement in WWW.

  (ii)  P2P file sharing.

-----------------------------------

**6E3202**

**6E3202**
**B. Tech. VI Sem. (Main & Back) Exam., May/June-2014**
**Computer Engg.**
**6CS2: Design and Analysis of Algorithm**

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 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.*
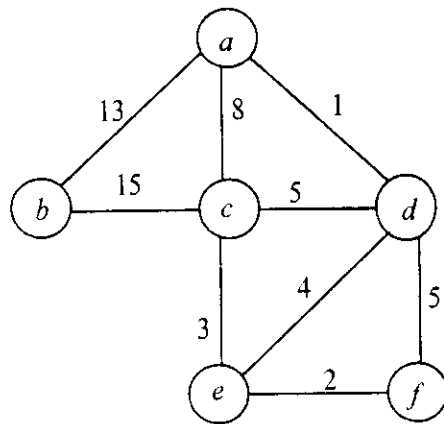
1. _____          2. _____

# UNIT-I

Q.1 (a) Explain best-case, average-case, worst-case running time of Merge sort algorithm.

(b) Solve the recurrence relation for time complexity:

$$T(n) = 2 \qquad \qquad \text{if } n = 2$$

$$= 2\,T(n/2) + 3*n \qquad \text{if } n > 2$$

(c) Find minimum cost spanning tree by implementing prim's algorithm for given weedted graph. [4+6+6]

weighted graph.



## OR

Q.1 (a) Write an algorithm to search an element from a given array by binary search method. Discuss the time complexity of the algorithm. [6]

(b) One file has ten characters (a, b, c, '\n', e, f, g, h, i, ' ') whose frequencies are 27, 31, 11, 5, 72, 51, 89, 33, 2 and 10 respectively.

   (i) Find optimal binary merge pattern tree for above file.

   (ii) Generate Huffman code for string "fge\nah".

   (iii) Translate given Huffman code 111101110111111100000110 into text format by above pattern. [4+2+4]

# UNIT-II

Q2 (a) What is the difference between Divide & Conquer and Dynamic Programming method? Explain with example.

(b) Find the optimal parenthesization of matrix-chain product whose sequence of dimensions is (4,10,4,40,5) [4+12]

## OR

Q.2 a) Explain Backtracking method by using the example of 4-Queen Problem with flow diagram. [6]

(b) For given Traveling Salesman Problem matrix:

| ∞ | 6 | 0 | 2 |
|---|---|---|---|
| 5 | ∞ | 7 | 0 |
| 0 | 4 | ∞ | 14 |
| 8 | 0 | 0 | ∞ |

(i) What is the reduced cost matrix?

(ii) Find the optimal tour of given Traveling Salesman Problem.          [3+7]

# UNIT-III

Q3 (a) Explain both the heuristics of Boyer-Moore Algorithm with suitable examples.

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

| Tasks ⇒ Agents ⇓ | 1 | 2 | 3 |
|---|---|---|---|
| A | 14 | 17 | 13 |
| B | 12 | 16 | 11 |
| C | 13 | 19 | 14 |

## OR

Q.3 a) Explain and construct the KMP flow chart for pattern P= "ABABCB" and also show the Actions perform of KMP flow chart with given text T = "ACABAABABA'"

(b) Explain the quadratic assignment problem with suitable example.          [10+6]

# UNIT-IV

Q.4 (a) What are the randomized algorithms? Explain two randomized algorithms - Las Vegas algorithm and Monte Carlo algorithm by giving suitable examples.   [2+4]

(b)  What do you mean by Multi - commodity flow in the network? Find the max flow path by Ford-Fulkerson method for given network:  [3+7]
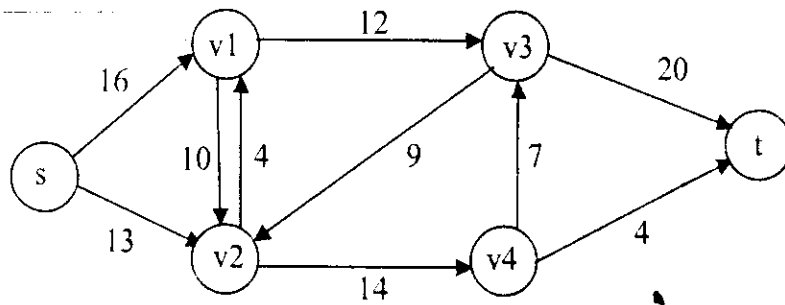


## OR

Q.4  (a)  State the Randomized min cut theorem.

(b)  Show Randomized min cut operation for the following given graph:
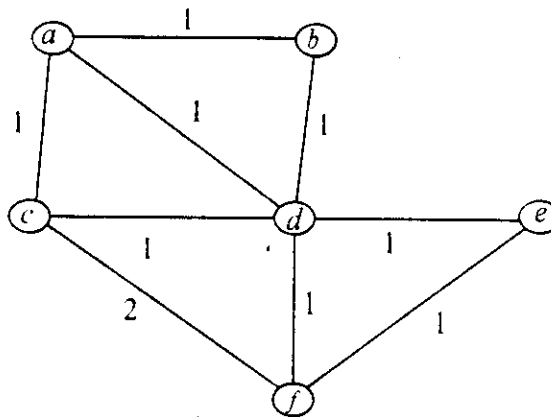


(c)  Write Flow shop Scheduling algorithm.  [3+8+5]

# UNIT-V

Q5  (a)  Explain the terms P, NP, NP-Hard. NP-COMPLETE with suitable example. Also give relationship between them.

(b)  Write algorithm for approximation for vertex cover problem with suitable example.

(c)  Show that the Hamilton cycle problem is NP- Complete.  [4+6+6]

## OR

(a)  State the Cooks theorem. What is significance of this algorithm?

(b)  Prove that the Circuit Satisfiability problem is NP complete.

(c)  Write algorithm for approximation for set cover problem with suitable example.

[4+6+6]

**6E3203**

**6E3203**
**B. Tech. VI Sem. (Main & Back) Exam., May/June-2014**
**Computer Engineering**
**6CS3 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 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.*
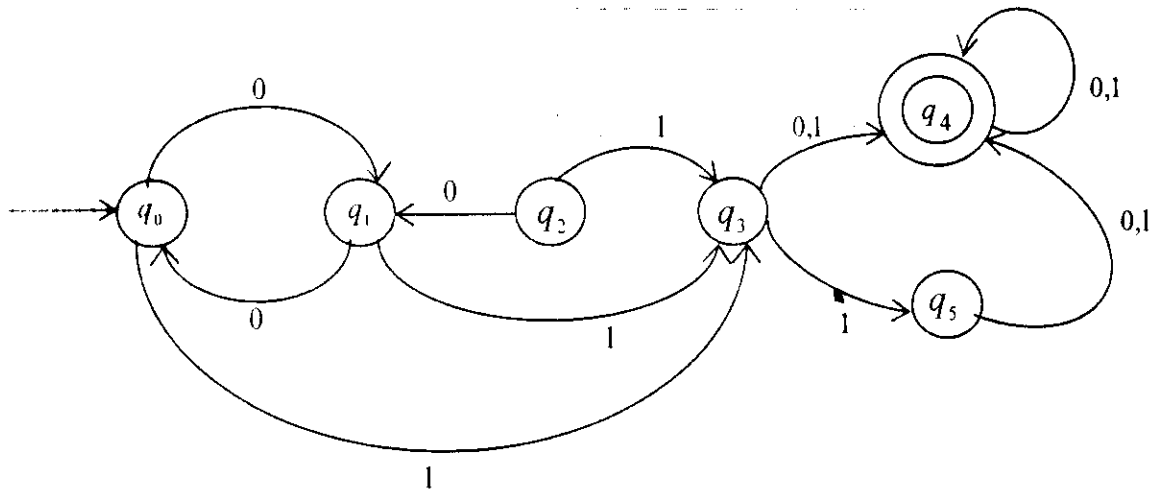
1._____                    2._____

# UNIT-I

Q.1 (a) Explain the basic concepts of finite state systems. Also explain the terms trap state, final state, non final state, & Initial state.                                    [16]

## OR

Q.1 (a) Minimize the following finite automata. Also write procedure for minimization.

[10]



(b) Explain difference between deterministic and non deterministic finite Automata.

[6]

# UNIT-II

Q.2 (a) State and explain pumping lemma for regular sets. Prove that following expression is regular or not regular using pumping lemma.

$$L = \{a^n b^m : n \leq m + 3\}$$

[8]

(b) Explain the concept of Regular sets and Regular grammar with the help of an example.

[3]

## OR

Q.2 (a) Write down the closure properties of regular languages. Also describe Pigeon

hole principle.

[8]

(b) Write down the regular expression and finite Automata / Transition Diagram for

following languages over alphabets $\Sigma = \{a, b\}$

(i) Set of string that starts with "aa" and end with "ab".

(ii) Set of string that starts with "a" and ends with "b" and having at least one string of "abab". [4x2]

# UNIT-III

Q.3 (a) What is push down automata? Design a push down automata for language L = {$a^n b^n$ : $\geq 1$}, also check the acceptability of string "a aa b bb a b". [10]

(b) Explain Greiback normal form in detail. [6]

## OR

Q.3 (a) Explain context free grammar and find the context free grammar for the following languages.

(i) L = {$a^n b^m$ : $n \geq 1$} [6]

(ii) L = {$a^n b^m$ : $n \leq m + 1$} [5]

(iii) L = {$a^n b^n$ : $n > 0$} [5]

# UNIT-IV

Q.4 (a) Explain Turing Machine. Also explain the difference between Multitape and Multidimensional Turing Machine. [10]

(b) Explain Rice's theorems in detail. [6]

## OR

Q.4 (a) Design a Turing Machine that computes 2's complement of the given string over the $\Sigma$ = {0, 1}. Also show the output of the machine for string "00000" [10]

(b) Write a short note on Universal Turing Machine in detail. [6]

# UNIT-V

Q.5 (a) Explain context free grammar. Also differentiate it from context sensitive grammar. [8]

(b) Write short note on Chomsky Hierarchy of Languages in detail. [8]

## OR

Q.5 (a) State and explain the linear bounded Automata. Also describe the organization of linear bounded Automata. [10]

(b) Explain the properties of Context – Sensitive languages. [6]

---------------------------------

| | |
|---|---|
| **6E3204** | Roll No. _____      Total No of Pages: 4 |

**6E3204**

**B. Tech. VI Sem. (Main & Back) Exam., May/June-2014**
**Computer Engineering**
**6CS4 Programming in Java**
**Common to SC & 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 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.*

1._____        2._____

# UNIT-I

Q.1 (a) Distinguish between the following terms:-

(i) Object and class

(ii) Data abstraction and data encapsulation

(iii) Inheritance and polymorphism

(iv) Dynamic binding and message passing        [4 x4 = 16]

## OR

Q.1 (a) What is multithreading? How does it improve the performance of JAVA.      [8]

(b) What are command line arguments? How they are useful? [4]

(c) What is type casting? Why is it required in programming? [4]

# UNIT-II

Q.2 (a) Find errors, if any, in each of following looping segments

    (i)   While (Count ! = 10);

       {

       Count = 1;

       Sum = sum + 1;

       Count - Count + 1;

       }

    (ii)  For (x =1, x > 10; x = x+1)

       {

       . . . . . . .

       . . . . . . .

       } [4 x 2 =8]

(b) Write a program to compute the sum of the digits of a given integer number [8]

## OR

Q.2 (a) What are the applications of wrapper classes? [4]

(b) How does Java handle strings? [4]

(c) Compare and contrast overloading and overriding methods. [8]

203

# UNIT-III

**Q.3 (a)** Describe the various forms of implementing interfaces. Give example of java code for each use. [10]

**(b)** What is string buffer? Give the three ways of creating a string object. [6]

## OR

**Q.3 (a)** What is static import? How is it useful? [3]

**(b)** How do we add a class or an interface to a package? [5]

**(c)** Describe the various level of access protection available in packages. [8]

# UNIT-IV

**Q.4 (a)** What is a finally block? When and how is it used? Give a suitable example. [8]

**(b)** Explain how exception handling mechanism can be used for debugging a program? [8]

## OR

**Q.4** Define an exception called "No Match Exception" that is thrown when a string is not equal to "India". Write a program that uses the exception. [16]

# UNIT-V

**Q.5 (a)** Describe the complete life cycle of a thread. [8]

**(b)** Why do applet classes need to be declared as public? [8]

## OR

Q.5 (a) Develop a simple real – life application program to illustrate the use of multithreads. [10]

(b) How do applets differ from application programs? [6]

---------------------------------

Roll No. _____

Total No of Pages: 3

**6E3205**

**B. Tech. VI Sem. (Main & Back) Exam., May/June-2014**
**Computer Engineering**
**6CS5 Embedded System Design**

6E3205

**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 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.*

1. _____Nil_____      2. _____Nil_____

# UNIT-I

Q.1  (a)  What is an embedded system?                                           [2]

(b)  Explain briefly embedded development environment.                          [8]

(c)  Write the difference between microprocessor and microcontroller.           [6]

## OR

Q.1  (a)  What are the parameters of choosing a microcontroller?                [8]

(b)  Explain SOC in an embedded system.                                         [8]

# UNIT-II

Q.2  (a)  What are different types of addressing modes in MSP430? Explain with example.

[8]

(b)  Explain MSP430 interrupts and interrupt structure.  [8]

## OR

Q.2  Discuss following with diagram:

(i)  LED, LCD interfacing  [4]

(ii)  Seven segment interfacing  [4]

(iii)  ADC interfacing  [4]

(iv)  DAC interfacing  [4]

# UNIT-III

Q.3  (a)  How many registers are in ARM? Explain CPSR.  [8]

(b)  What is pipelining in ARM? Explain three stage pipelining.  [8]

## OR

Q.3  (a)  Explain stack operation in ARM with stacks instructions.  [8]
(b)  Explain Exception and its mode in ARM.  [8]

# UNIT-IV

Q.4  Explain following in 8051 microcontroller:

(i)  Internal architecture with diagram.  [8]

(ii)  Interrupt programming.  [8]

## OR

Q.4 Explain following in 8051 micro controller

(i) Addressing mode with example. [8]

(ii) Different groups of instruction set with one instruction from each group. [8]

# UNIT-V

Q.5 Discuss in embedded system:

(i) Energy meter [4]

(ii) Smoke detector [4]

(iii) CPU performance issue [4]

(iv) Program execution time analysis issue [4]

## OR

Q.5 Discuss in embedded system:

(i) Wireless sensor network [4]

(ii) Data acquisition system [4]

(iii) CPU power consumption issue [4]

(iv) Low power programming's in interrupts. [4]

---

**6E3206**

**6E3206**

**B. Tech. VI Sem. (Main & Back) Exam., May/June-2014**
**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 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.*

1._____                    2._____

# UNIT -I

Q.1  (a)  How message passing is implemented in operating system? Describe its design issues in detail. Write the advantage of message passing system in Windows and Linux operating system.                                    [8]

     (b)  Explain RPC and RMI mechanisms in brief.                       [8]

**OR**

Q.1  (a)  Describe client server model with diagram.                    [8]

     (b)  What are Windows thread, Linux thread and Solaris thread? Explain different threading issues in detail. Why it is needed in operating system?    [8]

# UNIT-II

Q.2 (a) How directories are implemented in file system? Explain reliability and integrity in file system. [8]

(b) What are different problems faced during system security? Explain system network threats regarding RAID system. [8]

## OR

Q.2 (a) What is firewall? Explain firewall to protect systems and network. How cryptography acts as a security tool in RAID system? Explain along with its structure. [10]

(b) Explain boot block, bad-block and swap-space management. [6]

# UNIT -III

Q.3 (a) What do you mean by network file system? Explain booting and login process.

[8]

(b) Explain file system structure and its implementation in Linux OS. Describe input output management of it in brief. [8]

## OR

(a) What is hard disk? What is its purpose? Explain architecture of its file system.

[6]

(b) Explain memory management in Linux and windows operating system. [10]

# UNIT -IV

Q.4 (a) What are security features of windows OS? Explain environment subsystem and its security mechanisms. [8]

(b) Explain multiprocessor OS with its architecture. Also explain how it supports in windows and Linux registry. [8]

## OR

Q.4 (a) What is process? Explain process scheduling and process synchronization. How we can provide security in it? [8]

(b) Explain in relation of file system: [2x4=8]

1. Internal layout

2. Recovery

3. Volume management

4. Fault tolerance

# UNIT -V

Q.5 (a) What is Data Compression and its basic concept? Explain the various Compression technique. [8]

(b) Write short notes on: [2x4=8]

1. Video server

2. Palm OS

3. Multimedia file storage mechanism

4. Audio and Graphic file format

## OR

Q.5 (a)    What is multos and symbian operating system? Also explain its application area.

[8]

(b)    Write shorts notes on:

1.    Clock driven and processor sharing approach.

2.    IEEE 1394

3.    Video server organization

4.    Window CE and java card                                    [2x4=8]

------------------------------

Roll No. _____          Total No of Pages: 3

**6E3207**

6E3207

**B. Tech. VI Sem. (Main & Back) Exam., May/June-2014**
**Computer Engineering**
**6CS6.2 Artificial Intelligence**

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)  Explain artificial intelligence with suitable example.                    [8]

(b)  Write the characteristics of production system, with various types of production systems.                    [8]

## OR

Q.1  (a)  Write the definition of Artificial intelligence & explain $A^*$ & $AO^*$ algorithm.  [8]

(b)  Discuss comparison between DFS & BFS with various types of control strategies.                    [8]

# UNIT-II

Q.2 (a) Explain Approaches to knowledge representation using predicate logic with example. [8]

(b) Explain issues in knowledge representation. [8]

## OR

Q.2 (a) Explain computable functions & predicates. [8]

(b) What is unification algo? Explain with examples. [8]

# UNIT-III

Q.3 Explain Baeyes' theorem & prove how Fuzzy logic is different from binary logic with example. [16]

## OR

Q.3 What are the concepts of semantic net in knowledge representation? Explain the theory of conceptual dependency using suitable diagram. [16]

# UNIT-IV

Q.4 (a) Explain the algo of minimaxi search procedure with suitable diagram of two-ply search & backing up the value of two-ply search. [8]

(b) Why does the search in game playing always proceeds forward from the current position rather than backward from goal state? [8]

## OR

Q.4 (a) What is Alpha – Beta planning strategy? Explain its need with example. [8]

(b) What do you mean by natural language processing? Explain in brief. [8]

# UNIT-V

Q.5 (a) What do you mean by expert system? Explain "MYCIN" in depth with block diagram. [8]

(b) Explain the concept of hopfield neural network with suitable sketch with its applications. [8]

## OR

Q.5 (a) What are the techniques used in measuring? Explain. [5]

(b) How "learning by example" is different from learning by taking advice? Explain it giving suitable example. [6]

(c) What are the issues of common sense? [5]

------------------------

Roll No. _____                                    Total No of Pages: 3

**6E3209**

**B. Tech. VI Sem. (Main & Back) Exam., May/June-2014**
**Information Technology**
**6IT5 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 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.*

1. _____              2. _____

# UNIT –I

Q.1 (a) Define Entropy and prove that $0 \leq H \leq \log_2 M$               [8]

   (b) Write technical note on discrete memory less channels & conditional entropy.

[4+ 4=8]

## OR

Q.1 (a) Discrete source emits 1 of 5 symbols once every millisecond. The symbol probabilities are **1/2, 1/4, 1/8, 1/16, 1/16**. Find the source entropy & information rate.               [8]

   (b) What is source coding theorem? Explain in detail.               [8]

# UNIT -II

Q. 2 (a)  Prove that the capacity of a additive white Gaussian noise channel is

$$C = B \log_2 [1 + S / N]$$

Where B= Bandwidth of channel, S= Signal Power, N= Noise power          [8]

(b)  Consider a source X with 6 symbols probabilities are **0.3, 0.25, 0.2, 0.12, 0.08 & 0.05**. Find the Huffman code for the symbols. Also find the entropy, average code length & efficiency.          [8]

## OR

Q.2  (a)  Prove that $H(x) = \frac{1}{2} \log (2 \pi \sigma^2 e)$.          [8]

(b)  A DMS source has five symbols with probabilities **0.4, 0.19, 0.16, 0.15, 0.1**. Construct Shannon Fano code & calculate efficiency.          [8]

# UNIT -III

Q.3  Design a linear block code with a minimum distance of 3 and a message block of 8 bits.          [16]

## OR

Q.3  For a (6, 3) systematic linear block code the generator matrix is

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

(a)  Construct all possible code words.          [8]

(b)  Suppose the received word os 010111. Decode the received word by finding the location of error and then find transmitted data.          [8]

# UNIT -IV

Q. 4 (a) Design an encoder for (7, 4) cyclic code generated by $g(x) = 1 + x + x^3$. Also verify its operation for message word 0101. [8]

(b) Describe the decoder for cyclic code with the help of block diagram. [8]

## OR

Q.4 Construct the decoding table for the single error correcting (7, 4) cyclic code. Determine the data vector transmitted for the 1101101 received vector. Given that $G(x) = x^3 + x^2 + 1$. [16]

# UNIT -V

Q. 5 Write technical note on the following.

(a) Tree diagram

(b) Trellis diagram

(c) State diagram. [5+5+6=16]

## OR

Q.5 How Viterbi algorithms helps in decoding the convolutional code? [16]

--------------------------

Roll No. _____                                     Total No of Pages: 4

**6E3016**

B. Tech. VI Sem. (Old Back) Exam., May/June-2014 '
Computer & IT
6IT3 Design & Analysis of Algorithms
(Common with 6CS3)

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 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.*

1. _____                     2._____

# UNIT-I

Q.1  Part (a)  Solve the following recurrence

$$T(n) = 7T\left(\frac{n}{2}\right) + 3n^2$$

Where n is a power of 2 and is greater than 1.                    [8]

Part (b)  Write the algorithm for merge sort using divide and conquer method.    [8]

## OR

Q.1 Part (a)    Show the Strassen's multiplication for the following matrices -    [8]

$$A = \begin{bmatrix} 7 & 9 \\ 2 & 5 \end{bmatrix} \qquad \text{and} \qquad B = \begin{bmatrix} 3 & 2 \\ 6 & 5 \end{bmatrix}$$

Part (b)    Explain greedy method for job sequencing using a suitable example.    [8]

# UNIT-II

Q.2 Part (a)    Explain backtracking with the help of an algorithm.    [8]

Part (b)    Generate a state space tree for the following cost matrix:    [8]

$$Cij = \begin{array}{c} \\ A \\ B \\ C \\ D \end{array} \begin{array}{cccc} A & B & C & D \\ \begin{bmatrix} \infty & 10 & 5 & 3 \\ 8 & \infty & 9 & 7 \\ 1 & 6 & \infty & 9 \\ 2 & 3 & 8 & \infty \end{bmatrix} \end{array}$$

Use Branch and bound method.

## OR

Q.2 Part (a)    What its dynamic programming? Discuss the elements of dynamic programming.    [8]

Part (b)    Perform the Travelling salesman problem on the given matrix:    [8]

$$\begin{array}{c} \\ A \\ B \\ C \\ D \end{array} \begin{array}{cccc} A & B & C & D \\ \begin{bmatrix} \infty & 3 & 4 & 2 \\ 5 & \infty & 3 & 6 \\ 6 & 4 & \infty & 7 \\ 4 & 7 & 5 & \infty \end{bmatrix} \end{array}$$

# UNIT-III

Q.3 Part (a)    Explain the KMP matcher algorithm.                                    [8]

   Part (b)    Describe Naïve and Rabin Karp string matching algorithm.             [8]

## OR

Q.3 Part (a)    Explain Quadratic assignment problem using a suitable example.        [8]

   Part (b)    Describe Boyer Moore algorithm of string matching.                    [8]

# UNIT-IV

Q.4 Part (a)    What do you mean by randomized algorithms. Explain the types of
              randomized algorithms using suitable examples.                        [9]

   Part (b)    Explain randomized algorithm for Min cut.                            [8]

## OR

Q.4 Part (a)    Explain the following:-

              1.    Residual Network.

              2.    Augmenting path

              3.    Max flow min cut theorem                                         [4x3   ]

   Part (b)    What is Network Capacity assignment problem?

# UNIT-V

Q.5  Part (a)    Explain an approximation algorithm for vertex cover problem.        [8]

     Part (b)    What are P and NP class problems? Differentiate between NP complete and NP hard problems.                                                                [8]

## OR

Q.5  Part (a)    Explain an approximation algorithm for set c    er problem.            [8]

     Part (b)    Show that the Hamiltonian cycle problem is NP-Complete.              [8]

------------------------------

105

**6E3021**

**6E3021**

**B. Tech. VI Sem. (Old Back) Exam., May/June- 2014**
**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 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.*

1. _____                      2. _____

122

## UNIT-I

Q.1 (a)  Write and explain the protocols governing web in detail.

(b)  Explain the difference in creating personal websites and websites for corporate world.                                                                [10+6= 16]

## OR

Q.1 (a)  Describe various cyber laws for web applications.

(b)  Explain the planning and process development for web applications.    [7+9=16]

# UNIT -II

Q. 2 Explain the following terms incorporated in web development - [16]

(a) Tables

(b) Forms

(c) Images

(d) Frames

## OR

Q.2 (a)  Explain XML schemes and object models in detail.

(b)  What are the differences in HTML and Dynamic HTML? Explain with example.

[6+10 16]

# UNIT-III

Q.3 (a)  What are Java beans also explain the use of java beans in web development and technology.

(b)  Give advantages and properties of java beans.  [10+6= 16]

## OR

Q.3  What are Servlets? Explain the lifecycle of servlets and servlet API in detail along with their use.  [16]

# UNIT -IV

Q.4  What is JSP? Explain JSP Application design with appropriate example along with error handling and debugging.  [16]

## OR

Q.4 (a) Explain how sharing of data between JSP pages is done.

(b) Write short note on sharing session and application data incorporate with JSP.

[6+10=16]

# UNIT -V

Q.5 Explain the methods of accessing a database from a JSP page with example in detail.

[16]

## OR

Q.5 Write short note on -

(a) Developing java beans in a jsp page

(b) Struts framework                                                [8+8=16]

-----------------------------

Roll No. _____

**6E3022**

Total No of Pages: 3

**6E3022**

**B. Tech. VI Sem. (Old Back) Exam. May/June-2014**
**Computer & 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 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.*

1._____          2._____

# UNIT-I

Q.1 (a)  Explain and compare the single mode and multimode fibers.          [8]

(b)  A silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine -          [8]

(i)  The critical angle at the core-cladding interface.

(ii)  The NA for the fiber.

(iii)  The acceptance angle in air for the fiber.

## OR

Q.1 (a) Explain and give the significance of More Field Diameter (MFD) and V-numbers in optical communication. [8]

(b) Describe the Vapour phase deposition techniques for fabrication of fiber. [8]

# UNIT-II

Q.2 (a) What is difference between fiber splicing and connectors? Explain different types of splices with neat diagrams. [8]

(b) Explain the population inversion and single mode process in LASER. [8]

## OR

Q.2 (a) Compare and explain the PIN and Avalanche photo diodes use as photo detector. [8]

(b) When $3 \times 10^{11}$ photons each with a wave length of 0.85μm, are incident on a photodiode an average $1.2 \times 10^{11}$ electrons are collected at the terminals of the device. Determine the quantum efficiency and responsivity of the photo diode at 0.85 μA, wavelength. [8]

# UNIT-III

Q.3 (a) What is dispersion? Explain different types of dispersions with neat diagrams. [8]

(b) When the mean optical power launched into an 8 km length of fiber is 120 μw the mean optical power at the fiber output is 3 μw. Determine –

(i) The overall signal attenuation

(ii) The signal attenuation per kilometer of fiber

## OR

Q.3 (a) Explain the process of dispersion shifted and dispersion flattened optical fibers.

[8]

(b) Write short notes on single mode fiber. [8]

# UNIT-IV

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

(b) Explain the coherent optical fiber communication system. [8]

## OR

Q.4 (a) Write short note on Rise time and link power budget in optical communication.

[8]

(b) Explain the long haul systems bit error rate for optical communication. [8]

# UNIT- V

Q.5 (a) Write short note on SONET. [8]

(b) Explain the photonic switching in optical communication. [8]

## OR

(a) Compare and explain the semiconductor and optical amplifiers used in optical communication. [8]

(b) Explain wavelength division multiplexing (WDM) in optical fiber communication. [8]

-------------------------------