

**6E3022**

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**6E3022**

**B.Tech. Vth Semester (Main/Back) Examination, June - 2010**  
**Information Technology**  
**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.)*

**Unit - I**

1. a) With the help of neat diagram explain any one method of fibre fabrication in detail (12)
- b) Write the advantages & disadvantages of fibre optic communication (4)

**OR**

- a) Explain the different type of fibre and compare it. (10)
- b) Calculate the refractive index of core and cladding material of fibre whose numerical aperture is 0.35 and relative refractive index is 1%. (6)

**Unit - II**

2. a) Explain the material, construction and working principle of LASER diode and write the merits and demerits of LASER over LED. (12)
- b) Calculate internal quantum efficiency of LED whose radiative and non radiative life time are 2.5 m sec and 60 m sec respectively. (4)

**OR**

- a) Explain the construction, material and working of PIN photo diode. Write the factor which effects the speed of PIN diode. (10)
- b) Photon of wave length  $0.90 \mu\text{m}$  are incident on pn photo diode at a rate  $5 \times 10^{10} \text{ sec}^{-1}$  and on an average electron are collected at the terminal of the diode at a rate  $2 \times 10^{10} \text{ sec}^{-1}$  calculate internal quantum efficiency and responstivity of diode at this wave length (6)

### Unit - III

3. a) Explain various losses take place in fibre optic communication and how we can reduce losses in fibre. (10)
- b) Define the fibre misalignments and material dispersion (6)

OR

- a) Explain the dispersion shifted, flatten and compensated fibre in brief. (10)
- b) Consider 50/125  $\mu$  m step index fibre with  $n_1$  = refractive index of core  $n_1 = 1.47$  and relative refractive index  $\Delta = 1.5\%$ . Calculate delay (modal dispersion) in unit ns/km for this fibre at a operating wave length of 850 nm. (6)

### Unit - IV

4. Write in short :

- a) Optical filter & link design
- b) Line coding (10+6=16)

OR

Write in short

- a) Modulation technique for Heterodyne system.
- b) Code eye pattern (10+6=16)

### Unit - V

5. a) Explain the working of Erbium doped fibre amplifier (EDFA) Also write its advantages and disadvantages over semiconductor optical amp. (10)
- b) What are the significance (importance) of optical network and optical switching (6)

OR

Write the short notes on any two of following

- a) WDM
- b) Fibre distributed data interface (FDDI)
- c) SONET (8×2=16)

**6E3021**

Roll No. \_\_\_\_\_

[Total No. of Pages : 2]

**6E3021****B.Tech. VIth Semester (Main) Examination, June - 2010****Information Technology****6IT4 Web Technology****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

*Attempt overall 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.)*

**Unit - I**

1. Describe web development strategies, planning and process development and protocols for web development? (16)

**OR**

Describe the following

- a) Cyber laws and Applications.
- b) Identification of Web Objects.
- c) Web form and target user module.
- d) Planning and process development. (4×4)

**Unit - II**

2. Describe the DOM and objects in Java Scripts? (16)

**OR**

Differentiate following pairs with suitable examples.

- a) HTML v/s DHTML.
- b) Table v/s Frame.
- c) XML v/s CSS.
- d) Control structure in Java Script v/s Decision structure in Java Scripts. (4×4)

### Unit - III

3. a) What is Java beans and advantage of Java beans? (8)  
b) Describe Java beans API? (8)

OR

What is `Servlet` and describe `Servlet` packages, security Issues? (16)

### Unit - IV

4. Describe the following :-
- a) JSP processing.
  - b) Tom cat Server configuration.
  - c) Implicit JSP objects.
  - d) Error bandling and debugging in JSP. (4×4)

OR

Explain the following with example :-

- a) Detaring variables and methods in JSP.
- b) Data sharing between JSP pages. (8×2)

### Unit - V

5. a) What do you mean by database connectivity and describe JDBC with suitable example? (10)  
b) Explain methods for accessing database from JSP pages. (6)

OR

Write a notes on

- i) Java x.sql package
- ii) Struts Frame work. (8×2)

**6E3026**

Roll No. \_\_\_\_\_

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**6E3026****B.Tech. VIth Semester (Main/Back) Examination, June - 2010****Information Technology****6IT6.3 IT Infrastructure Management (Elective)****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

*Attempt carry 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.)*

**Unit - I**

1. a) What IT Infrastructure means. What services are provided by IT Infrastructure. (8)
- b) Explain "Total cost of Ownership". How TCO is calculated and what benefits TCO gives. (8)

**OR**

- a) Explain the value of system management for Business. (8)
- b) Write short note on Complexity of today's computing environment. (8)

**Unit - II**

2. a) What ITIL means. What features ITIL contains. (8)
- b) What are different methods to identify customer's requirement. (8)

**OR**

- a) Explain the benefits of ITIL. (8)
- b) What factors are considered during designing of IT organization. (8)

### Unit - III

3. a) What is availability management. What benefits are provided by availability management. (8)
- b) What is service level management and its objective. By what factors service level management is affected. (8)

OR

- a) Explain financial management for IT services in detail. (8)
- b) Explain various inputs of capacity management and benefits of capacity management. (8)

### Unit - IV

4. a) Why incident management is required. Describe IT infrastructure library approach to incident management. (8)
- b) What service desk do. What is typical situation of support without service desk. (8)

OR

What is change management. Define roles of change management and key participants in change management. (16)

### Unit - V

5. a) What do you mean by Lightweight Directory Access Protocol. Give protocol overview and directory structure for this protocol. (8)
- b) What is identity management. What are components of identity management and what tasks are performed by identity management. (8)

OR

- a) What is Bare-machine recovery and describe its strategies. (8)
- b) What is Access Management. Explain components and benefits of Access management (8)

**6E3018**

Roll No. \_\_\_\_\_

[Total No. of Pages : 3]

**6E3018****B.Tech. VIth Semester (Main/Back) Examination, June - 2010****Computer Engineering****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 may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

**Unit - I**

1. a) Suppose we restrict DFA so that they have at most one accepting state. Can any regular language L be recognized by this restricted form of DFA? Justify your answer? **(8)**
- b) For the following NDFFA find equivalent DFA. **(8)**

State	Inputs	
	0	1
$\rightarrow q_0$	$\{q_0, q_1\}$	$\{q_0, q_3\}$
$q_1$	$\{q_2\}$	$\phi$
$\textcircled{q_2}$	$\phi$	$\phi$
$q_3$	$\phi$	$\{q_4\}$
$\textcircled{q_4}$	$\phi$	$\phi$

OR

- a) Construct a Mealy machine with  $\Sigma = \Delta = \{0,1\}$ . The output is 1 whenever the last four symbols read are 1111. Overlapping sequence are accepted. Output is 0 otherwise. (8)
- b) Let  $\Sigma = \{a,b,c\}$  (2×4=8)
- Draw a DFA that rejects all words for which the last two letters match.
  - Draw a DFA that rejects all words for which the first two letters match.

Unit - II

2. a) Write regular expression for each of the following language over the alphabet  $\{a, b\}$ . (4×2=8)
- The set of strings containing  $ab$  as a substring.
  - The set of string having at most one pair of consecutive  $a$ 's and at most one pair of consecutive  $b$ 's.
  - The set of string whose length is divisible by 6.
  - The set of string whose 5<sup>th</sup> last symbol (5<sup>th</sup> symbol from the end) is  $b$ .
- b) By using pumping lemma prove that  $L = \{a^n : n \geq 0\}$  is not regular. (8)

OR

- a) Prove the following identity  $(a^*ab+ba)^*a^* = (a+ab+ba)^*$ . (8)
- b) Are the following true or false? Support your answer by giving proofs or counter examples : (4+4=8)
- If  $L_1 \cup L_2$  is regular and  $L_1$  is regular, than  $L_2$  is regular.
  - If  $L^*$  is regular then  $L$  is regular.

Unit - III

3. a) Show that grammar  $S \rightarrow aB/ab, A \rightarrow aAB/a, B \rightarrow ABb/b$  is ambiguous. (6)
- b) What is difference between context free language and Deterministic context free language. Give example of both language. (4)
- c) If  $L$  is context free language and  $R$  being regular then prove. (3+3=6)
- $L \cap R$  is context free.
  - $L - R = L \cap \bar{R}$  is also a context free.

OR

- a) Find a grammar in chomsky normal form equivalent to  $S \rightarrow aAbB, A \rightarrow aA/a, B \rightarrow bB/b$ . (8)
- b) Let  $L = \{a^i b^j c^k / i, j, k \geq 1 \text{ and } i + j = k\}$ . Find a PDA (which accepts Via final state) that recognizes  $L$ . (8)

### Unit - IV

4. a) Construct a Turing Machine over an alphabet  $\{0, 1, \#\}$ , where 0 indicates blank, which takes a non null string of 1's and #'s and transfers the right most symbol to the left hand end. Thus ..... 000 # 1 # 1 # 1000 becomes .....0001 # 1# 1 # 000.

The Head is initially at the leftmost non blank symbol. (8)

- b) Explain the following : (4+4=8)
- i) Subroutines
  - ii) Closure properties of recursive and Recursively enumerable language.

OR

- a) Make the comment on the following statement finite state machine with two stack is as powerful as Turing Machine. (4)

- b) Explain the following : (2+2=4)
- i) Universal Turing Machine
  - ii) Rice Theorem.

- c) Design a Turing Machine that accepts  $\{0^n 1^n / n \geq 1\}$ . (8)

### Unit - V

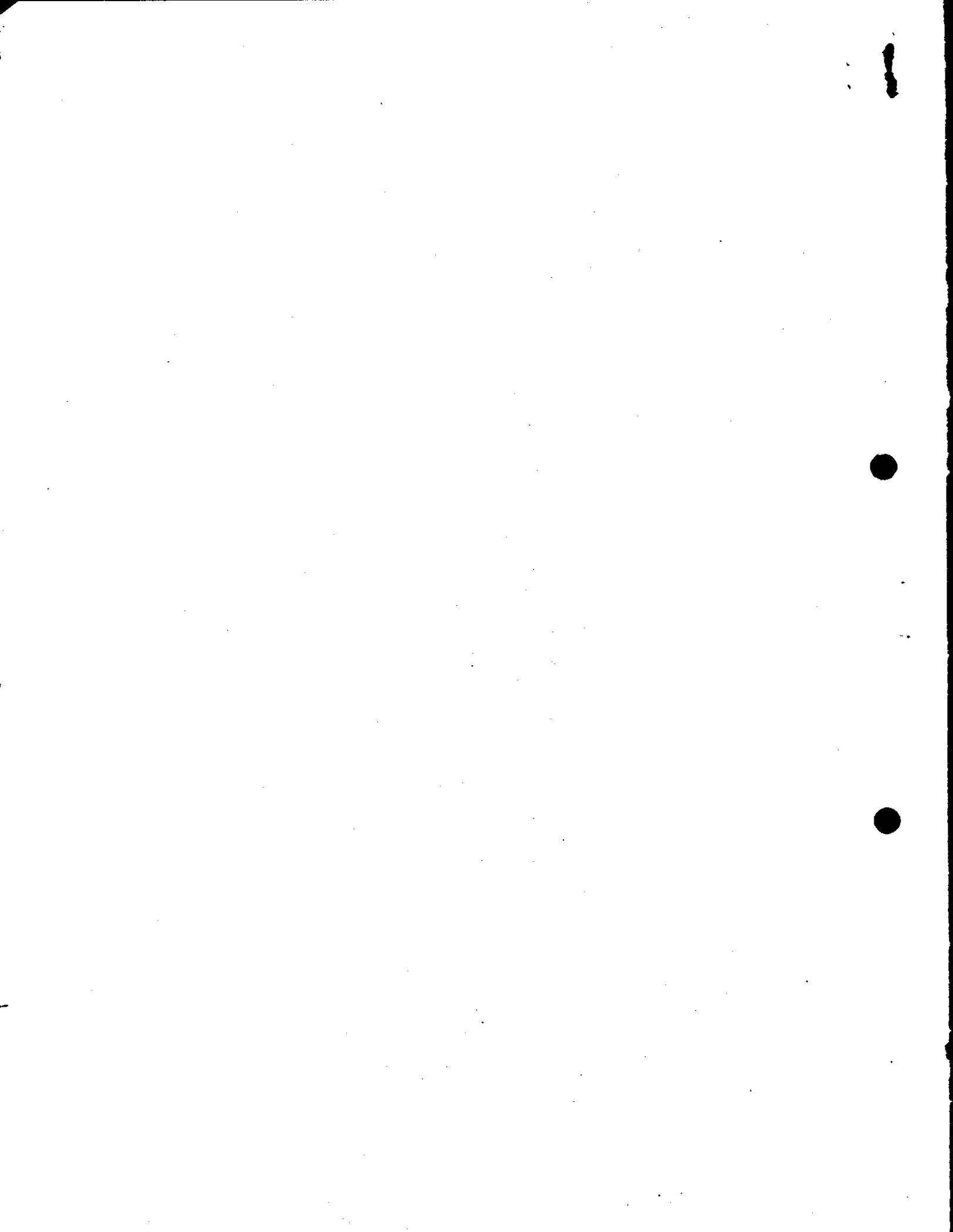
5. a) Explain the model of Linear Bounded Automata. (6)
- b) Find the grammar generating the set accepted by a linear bounded Automata  $M$  whose transition table as follows. (10)

Present state	Tape input Symbol			
	$\phi$	\$	0	1
$\rightarrow q_1$	$c R q_1$		$1 L q_2$	$0 R q_2$
$q_2$	$c R q_4$		$1 R q_3$	$1 L q_1$
$q_3$		$\$ L q_1$	$1 R q_3$	$1 R q_3$
$\textcircled{q_4}$		Halt	$0 L q_4$	$0 R q_4$

OR

Prove the following closure properties of context sensitive language : (4×4=16)

- |                    |                 |
|--------------------|-----------------|
| a) Union           | b) Intersection |
| c) Complementation | d) Transpose.   |



**6E3017**

Roll No. \_\_\_\_\_

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**6E3017****B.Tech. VIth Semester (Main/Back) Examination, June - 2010****Computer Engineering****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 may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

**Unit - I**

1. Categorize embedded systems. Describe requirements of embedded systems.

**OR**

Describe applications of embedded systems in biomedical systems and communication devices.

**Unit - II**

2. Describe embedded system development process in detail taking a suitable example.

**OR**

Describe various interface standards in detail.

**Unit - III**

3. Describe any software estimation tool in detail.

**OR**

Describe interfacing of 8051 with LCD, ADC, sensors, and key board.

#### **Unit - IV**

4. Describe in detail how simulation of a process control system can be done.

**OR**

Describe embedded database applications using energy meter reading as an example.

#### **Unit - V**

5. Describe tools available for building embedded systems taking a case study.

**OR**

Describe main features of PIC16F873 processor.

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**6E3020**

Roll No. \_\_\_\_\_

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**6E3020****B.Tech. VIth Semester (Main/Back) Examination, June - 2010****Computer Engineering****6CS6.2 Advanced Software Engineering****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

*Attempt carry 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.)*

**Unit - I**

1. a) Define Software configuration management (SCM) and explain some issues related to SCM. Why is SCM required? (12)
- b) Explain the term "Maintenance side - effects". (4)

**OR**

- a) What is software quality? Why do we require it? What is the role of software quality assurance in development system. (12)
- b) Explain software complexity. (4)

**Unit - II**

2. a) Explain software testing and the behavioral properties of software testing. (8)
- b) What do you mean by cyclomatic complexity? How it useful in generating the test cases. (8)

**OR**

- a) Write the functional specifications of an ideal debugger for an object oriented programming language. (8)
- b) Describe various types of program bugs and explain the debugging process. (8)

### Unit - III

3. a) What do you mean by International standards? List any two standards. Differentiate between ISO - 9126 and ISO - 12207. (12)
- b) Write short note on decision - making. (4)

OR

- a) What do you mean by leadership? What qualities must a project leader have to lead his team? (10)
- b) Explain the various roles in the organisation structure of software industry.(6)

### Unit - IV

4. a) Explain different types of testing that are used to test Web App. (10)
- b) Explain Web E process model. (6)

OR

How do you judge the quality of a Website? Make a list of ten quality attributes that you believe are most important.

Differentiate WebApp design pattern with template. (16)

### Unit - V

5. Describe the general model of software re-engineering. Differentiate between software engineering and software re-engineering. Also differentiate between forward engineering and reverse engineering. (16)

OR

What do you mean by CASE tools of CASE environment? Discuss the classification of CASE tools in detail. (16)

6E3014

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6E3014

**B. Tech. Vth Semester (Main/Back) Examination, June - 2010**  
**Computer & IT**  
**Operating Systems (Common for 6CS1 & 6IT1)**

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.)*

**Unit - I**

1. a) What is an operating system? Explain the salient features of various types of operating systems by taking suitable examples from present day operating system. (10)
- b) What are system calls? Describe different types of system calls. (6)

**OR**

- a) Consider the following set of processes with the length of CPU - burst time given in (m sec).

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

- i) Draw 4 gantt charts illustrating the execution of these processes using FCFS, SJF, non preemptive priority (a smaller priority number implies a higher priority) and RR (quantum = 1) scheduling.
  - ii) What is the turnaround time of each process for each of the scheduling algorithms in part (i) ?
  - iii) What is the waiting time of each process for each of the scheduling algorithm in part (i)?
  - iv) Which of the schedules in part (i) results in the minimal average waiting time. (4,2,2,2)
- b) Differentiate
- i) multitasking, multiprocessing & multi programming.
  - ii) hard real time and soft real time OS. (6)

### Unit - II

2. a) What is the difference between a program and a process? With the help of state transition diagram, explain various states of a process. (8)
- b) Explain producer consumer problem. How it is solved using semaphores?(8)

**OR**

- a) Consider following snap shot of a system

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using Banker's algorithm.

- i) What is the content of Matrix 'Need'?
- ii) Is system in safe state? Find safe sequence.
- iii) If a request from process P1 arrives for (0,4,2,0) can request be granted immediately? (3,4,3)

- b) Write short notes on : (6)
- i) Monitors
  - ii) Kernel level threads

### Unit - III

3. a) Given memory partitions of 100 k, 500 k, 200 k, 300 k and 600 k (in order), how would processes of 210 k, 418 k, 120 k and 437 k be placed using. (6)
- i) first fit algorithm.
  - ii) best fit algorithm.
  - iii) worst fit algorithm.
- b) What is the necessity for memory management? Explain segmentation technique with the help of block diagram. (10)

### OR

- a) How paging helps in eliminating fragmentation? Explain implementation of paging technique using TLB. (8)
- b) Describe briefly various structures of page tables. (8)

### Unit - IV

4. a) What is page fault? What are the steps taken by OS to overcome this situation? (6)
- b) Consider the following page reference  
1, 2, 3, 2, 5, 6, 3, 4, 6, 3, 7, 3, 1, 5, 3, 6, 3, 4, 2, 4, 3, 4, 5, 1. (10)  
Calculate total no. of page faults for
- i) LRU
  - ii) Optimal
  - iii) FIFO
- specify best technique assuming total no. of frames as 4,

### OR

- a) In demand paged memory, 200 m sec are required to satisfy memory request if the page is in memory. If the page is not in the memory, request takes 7m sec if a free frame is available. It takes 15 m sec if the page to be swapped out has been modified.
- What is the effective access time if the page fault rate is 5% and 60% of the time page to be replaced has been modified.

Assume the system is running only single process and CPU is idle during page swaps. (8)

- b) Write notes on (8)
- i) Thrashing
  - ii) Intruders - Virus trusted systems.

#### Unit - V

5. a) On a disk with 1000 cylinders, numbers 0 to 999, compute the number of tracks the disk arm must move to satisfy all the request in the disk queue. Assume the last request received was at track 345 and the head is moving towards track 0. The queue in FIFO order contains requests for the tracks 123, 874, 692, 475, 105, 376. Perform the computations for the following scheduling algorithm : FIFO, SSTF, SCAN, LOOK, C - LOOK. (10)
- b) What are distributed operating systems? Explain the design issues of distributed operating system. (6)

#### OR

- a) Describe various file access methods. Give advantages and disadvantages of contiguous and linked allocation strategies. (8)
- b) What is the benefit of using parallel processing? How parallel processing can be achieved through uniprocessor system? (8)
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6E3016

Roll No. \_\_\_\_\_

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6E3016

B.Tech. VIth Semester (Main/Back) Examination, June - 2010

Computer & IT

Design & Analysis of Algorithms

(Common for 6CS3 and 6IT3)

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

**Instructions to Candidates:**

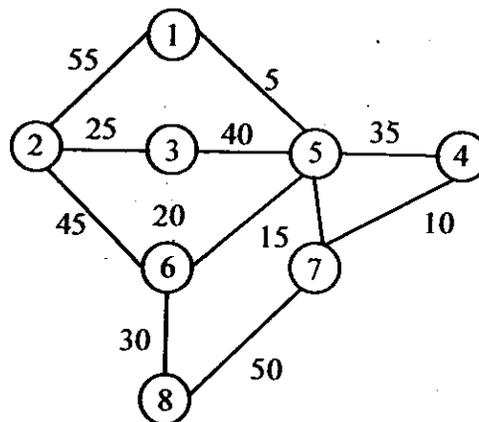
Attempt any five questions selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

**Unit - I**

1. a) Write a recursive algorithm for Binary Search. What is the time complexity of the algorithm? (5)
- b) Explain Strassen's matrix multiplication. Derive its time complexity. Why this is better than ordinary matrix multiplication? (5)
- c) What is the Greedy approach? Does it always give Optimal Solution? Give two examples in which Greedy algorithm gives optimal solution. (6)

**OR**

- a) Write an efficient algorithm to determine the second largest element of  $n$  numbers. Determine the number of comparisons needed to find it. (4)
- b) Trace the Kruskal's algorithm to obtain the minimum spanning tree from the following graph. (8)



(1)

- c) On what kind of input does the Quick sort algorithm exhibit its worst-case behaviour? Why? (4)

### Unit - II

2. a) Write mathematical formulation of 0-1 knapsack problem. Use dynamic programming approach to solve the following instance of the problem

Maximum capacity : 11 units

No of items : 5

Weights : 1, 2, 5, 6, 7

Profits : 1, 6, 18, 22, 28 (10)

- b) Prove that the lower bound of sorting a sequence of  $n$  elements using comparisons based sorting algorithm is  $n \log n$ . (6)

### OR

- a) Give an  $8 \times 8$  chessboard. A 'q' is placed on the one square of the chessboard. You have to place only one 'q' in each row and column and no two 'q' can be placed diagonally. Write the algorithm for the above problem using backtracking method. (8)

- b) Write the short note on the following : (4+4)

- i) Longest common subsequence
- ii) Backtracking Algorithms.

### Unit - III

3. a) Write the Knuth-Morris-Pratt String Matching algorithm. What is its time complexity? Mention the situations when one should use the naive algorithm, Boyer-Moore algorithm and Knuth-Morris-Pratt algorithm. (10)

- b) Explain Rabin Karp method with suitable example. Also give the algorithm for the same. (6)

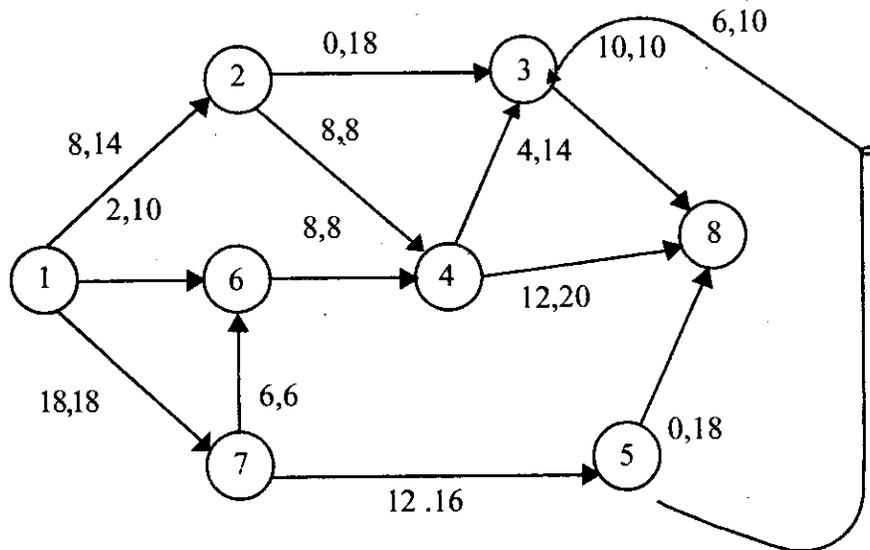
### OR

- a) Write Boyer-Moore Matcher algorithm for string matching. What is the use of prefix function in Knuth-Morris-Pratt String Matching Algorithm? (10)

- b) What is the basic idea behind String Matching? Explain with suitable example. (6)

### Unit - IV

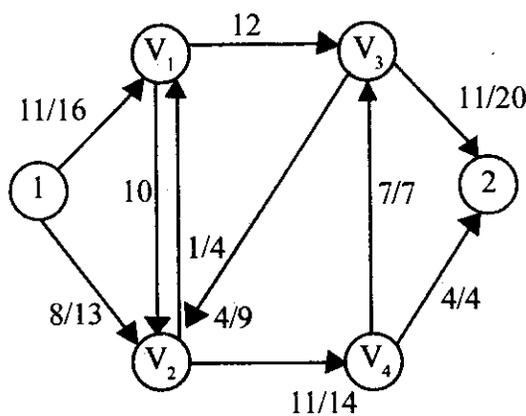
4. a) State and prove Ford Fulkerson's theorem. Find out the maximum flow and minimum cut for the following network at a state, where first entry represents flow along that arc and second entry represents the capacity of that arc. (10)



- b) Explain the terms flow and capacity in a network. What are meant by properly and improperly oriented edges? (6)

**OR**

- a) Define a Flow Network. What is the goal of the Flow Network? What are the properties of a Flow Network? Prepare Residual Network for the following Flow Network. (10)



- b) Explain the randomized algorithm. Write the advantages of the randomized algorithm. (6)

**Unit - V**

5. a) Assuming 3-CNF satisfiability problem to be NP-Complete, prove clique problem is also NP-Complete. (10)
- b) Explain the Cook's theorem with suitable example. (6)

**OR**

- a) Show that traveling salesman problem is NP complete. (10)
- b) Explain Vertex and set cover problem. (6)
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**6E3015**

Roll No. \_\_\_\_\_

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**6E3015****B.Tech. VIth Semester (Main/Back ) Examination, June - 2010****Computer & IT****Computer Networks (Common for 6CS2 and 6IT2)****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.)*

**Unit - I**

1. a) Briefly explain services and protocols of layers of OSI protocol hierarchy. (8)  
b) Explain major classes of guided media. What is the purpose of cladding in optical fiber? (8)

**OR**

- a) Describe hardware and software issues in Internetworking. (8)  
b) Write short note on : (8)  
i) Internetworking devices.  
ii) Internet backbone.

**Unit - II**

2. a) Explain e-mail architecture along with its main components. (8)  
b) What is DNS? Why it is required? When a DNS server receives a request, what are the possible actions that it can take? (8)

**OR**

- a) Describe the steps involved when a web Browser requests for and obtains a web page from a web server. Why HTTP is known as stateless protocol? (8)  
b) Write any four for HTTP and FTP commands with syntax and suitable illustrations (8)

### Unit - III

3. a) Explain three multiplexing techniques. Distinguish between multilevel TDM, multiple shot TDM and pulse-stuffed TDM. (8)
- b) Differentiate between ports and sockets in context of TCP & ip protocols.(8)

OR

- a) Discuss broadlevel function of TCP. How does three-way handshake for-creating a TCP connection work? (8)
- b) What features make TCP reliable? Explain the frame format and purpose of various fields of TCP packet format. (8)

### Unit - IV

4. a) Briefly describe subnetting and supernetting. How do they differ from a default mask in classfull addressing? (8)
- b) Briefly explain the following : (8)
- i) NCP & LCP
  - ii) Link state Routing

OR

- a) Write a detailed note on tunnelling strategy and fragmentation. (8)
- b) Compare and contrast the fields of ipv4 and ipv6 datagram format. (8)

### Unit - V

5. a) What is SONET ? Explain the functions of its various layers with suitable diagrams. (8)
- b) What is virtual tributary? What are its various types? (8)

OR

- a) Explain physical configuration of SONET devices. What is relationship between SONET and SDH? (8)
- b) What is relationship between STS signals and OC signals? (8)

6E3026

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6E3026

**B.Tech. VIth Semester (Main/Back) Examination, June - 2010**

**Information Technology**

**6IT6.3 IT Infrastructure Management (Elective)**

**Time : 3 Hours**

**Maximum Marks : 80**

**Min. Passing Marks : 24**

**Instructions to Candidates:**

*Attempt carry 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.)*

**Unit - I**

1. a) What IT Infrastructure means. What services are provided by IT Infrastructure. (8)
- b) Explain "Total cost of Ownership". How TCO is calculated and what benefits TCO gives. (8)

**OR**

- a) Explain the value of system management for Business. (8)
- b) Write short note on Complexity of today's computing environment. (8)

**Unit - II**

2. a) What ITIL means. What features ITIL contains. (8)
- b) What are different methods to identify customer's requirement. (8)

**OR**

- a) Explain the benefits of ITIL. (8)
- b) What factors are considered during designing of IT organization. (8)

### Unit - III

3. a) What is Java beans and advantage of Java beans? (8)  
b) Describe Java beans API? (8)

OR

What is *Servlet* and describe *Servlet* packages, security Issues? (16)

### Unit - IV

4. Describe the following :-  
a) JSP processing.  
b) Tom cat Server configuration.  
c) Implicit JSP objects.  
d) Error bandling and debugging in JSP. (4×4)

OR

Explain the following with example :-

- a) Detaring variables and methods in JSP.  
b) Data sharing between JSP pages. (8×2)

### Unit - V

5. a) What do you mean by database connectivity and describe JDBC with suitable example? (10)  
b) Explain methods for accessing database from JSP pages. (6)

OR

Write a notes on

- i) Java x.sql package  
ii) Struts Frame work. (8×2)
-

**6E3022**

Roll No. \_\_\_\_\_

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**6E3022****B.Tech. Vth Semester (Main/Back) Examination, June - 2010****Information Technology****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.)*

**Unit - I**

1. a) With the help of neat diagram explain any one method of fibre fabrication in detail (12)
- b) Write the advantages & disadvantages of fibre optic communication (4)

**OR**

- a) Explain the different type of fibre and compare it. (10)
- b) Calculate the refractive index of core and cladding material of fibre whose numerical aperture is 0.35 and relative refractive index is 1%. (6)

**Unit - II**

2. a) Explain the material, construction and working principle of LASER diode and write the merits and demerits of LASER over LED. (12)
- b) Calculate internal quantum efficiency of LED whose radiative and non radiative life time are 2.5 m sec and 60 m sec respectively. (4)

**OR**

- a) Explain the construction, material and working of PIN photo diode. Write the factor which effects the speed of PIN diode. (10)
- b) Photon of wave length  $0.90 \mu\text{m}$  are incident on pn photo diode at a rate  $5 \times 10^{10} \text{ sec}^{-1}$  and on an average electron are collected at the terminal of the diode at a rate  $2 \times 10^{10} \text{ sec}^{-1}$  calculate internal quantum efficiency and responstivity of diode at this wave length (6)

### Unit - III

3. a) Explain three multiplexing techniques. Distinguish between multilevel TDM, multiple shot TDM and pulse-stuffed TDM. (8)
- b) Differentiate between ports and sockets in context of TCP & ip protocols.(8)

**OR**

- a) Discuss broadlevel function of TCP. How does three-way handshake for-creating a TCP connection work? (8)
- b) What features make TCP reliable? Explain the frame format and purpose of various fields of TCP packet format. (8)

### Unit - IV

4. a) Briefly describe subnetting and supernetting. How do they differ from a default mask in classfull addressing? (8)
- b) Briefly explain the following : (8)
- i) NCP & LCP
  - ii) Link state Routing

**OR**

- a) Write a detailed note on tunnelling strategy and fragmentation. (8)
- b) Compare and contrast the fields of  $ip_v4$  and  $ip_v6$  datagram format. (8)

### Unit - V

5. a) What is SONET ? Explain the functions of its various layers with suitable diagrams. (8)
- b) What is virtual tributary? What are its various types? (8)

**OR**

- a) Explain physical configuration of SONET devices. What is relationship between SONET and SDH? (8)
- b) What is relationship between STS signals and OC signals? (8)
-

**6E3021**

Roll No. \_\_\_\_\_

|Total No. of Pages : 2|

**6E3021****B.Tech. VIth Semester (Main) Examination, June - 2010****Information Technology****6IT4 Web Technology****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

*Attempt overall 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.)*

**Unit - I**

1. Describe web development strategies, planning and process development and protocols for web development? (16)

**OR**

Describe the following

- a) Cyber laws and Applications.
- b) Identification of Web Objects.
- c) Web form and target user module.
- d) Planning and process development. (4×4)

**Unit - II**

2. Describe the DOM and objects in Java Scripts? (16)

**OR**

Differentiate following pairs with suitable examples.

- a) HTML v/s DHTML.
- b) Table v/s Frame.
- c) XML v/s CSS.
- d) Control structure in Java Script v/s Decision structure in Java Scripts. (4×4)

### Unit - III

3. a) Explain various losses take place in fibre optic communication and how we can reduce losses in fibre. (10)
- b) Define the fibre misalignments and material dispersion (6)

OR

- a) Explain the dispersion shifted, flatten and compensated fibre in brief. (10)
- b) Consider 50/125  $\mu$  m step index fibre with  $n_1$  = refractive index of core  $n_1 = 1.47$  and relative refractive index  $\Delta = 1.5\%$ . Calculate delay (modal dispersion) in unit ns/km for this fibre at a operating wave length of 850 nm. (6)

### Unit - IV

4. Write in short :

- a) Optical filter & link design
- b) Line coding (10+6=16)

OR

Write in short

- a) Modulation technique for Heterodyne system.
- b) Code eye pattern (10+6=16)

### Unit - V

5. a) Explain the working of Erbium doped fibre amplifier (EDFA) Also write its advantages and disadvantages over semiconductor optical amp. (10)
- b) What are the significance (importance) of optical network and optical switching (6)

OR

Write the short notes on any two of following

- a) WDM
- b) Fibre distributed data interface (FDDI)
- c) SONET (8×2=16)

**6E3015**

Roll No. \_\_\_\_\_

[Total No. of Pages : 2]

**6E3015****B.Tech. Vth Semester (Main/Back) Examination, June - 2010****Computer & IT****Computer Networks (Common for 6CS2 and 6IT2)****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.)*

**Unit - I**

1. a) Briefly explain services and protocols of layers of OSI protocol hierarchy. (8)
- b) Explain major classes of guided media. What is the purpose of cladding in optical fiber? (8)

**OR**

- a) Describe hardware and software issues in Internetworking. (8)
- b) Write short note on : (8)
  - i) Internetworking devices.
  - ii) Internet backbone.

**Unit - II**

2. a) Explain e-mail architecture along with its main components. (8)
- b) What is DNS? Why it is required? When a DNS server receives a request, what are the possible actions that it can take? (8)

**OR**

- a) Describe the steps involved when a web Browser requests for and obtains a web page from a web server. Why HTTP is known as stateless protocol? (8)
- b) Write any four HTTP and FTP commands with syntax and suitable illustrations (8)

**Unit - V**

5. a) Assuming 3-CNF satisfiability problem to be NP-Complete, prove clique problem is also NP-Complete. (10)
- b) Explain the Cook's theorem with suitable example. (6)

**OR**

- a) Show that traveling salesman problem is NP complete. (10)
- b) Explain Vertex and set cover problem. (6)
-

6E3016

Roll No. \_\_\_\_\_

[Total No. of Pages : 4]

6E3016

B.Tech. VIth Semester (Main/Back) Examination, June - 2010

Computer & IT

Design & Analysis of Algorithms

(Common for 6CS3 and 6IT3)

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

**Instructions to Candidates:**

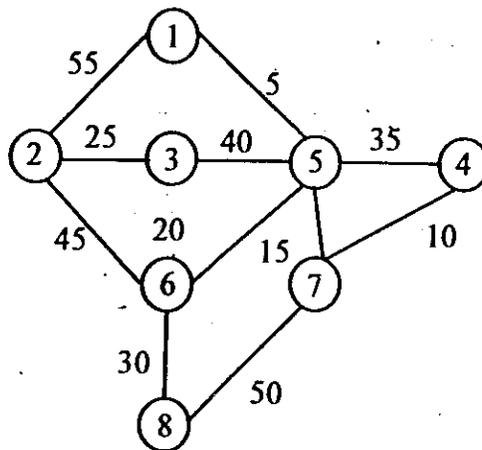
Attempt any five questions selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

**Unit - I**

1. a) Write a recursive algorithm for Binary Search. What is the time complexity of the algorithm? (5)
- b) Explain Strassen's matrix multiplication. Derive its time complexity. Why this is better than ordinary matrix multiplication? (5)
- c) What is the Greedy approach? Does it always give Optimal Solution? Give two examples in which Greedy algorithm gives optimal solution. (6)

**OR**

- a) Write an efficient algorithm to determine the second largest element of  $n$  numbers. Determine the number of comparisons needed to find it. (4)
- b) Trace the Kruskal's algorithm to obtain the minimum spanning tree from the following graph. (8)



- b) Write short notes on : (6)
- i) Monitors
  - ii) Kernel level threads

### Unit - III

3. a) Given memory partitions of 100 k, 500 k, 200 k, 300 k and 600 k (in order), how would processes of 210 k, 418 k, 120 k and 437 k be placed using. (6)
- i) first fit algorithm.
  - ii) best fit algorithm.
  - iii) worst fit algorithm.
- b) What is the necessity for memory management? Explain segmentation technique with the help of block diagram. (10)

### OR

- a) How paging helps in eliminating fragmentation? Explain implementation of paging technique using TLB. (8)
- b) Describe briefly various structures of page tables. (8)

### Unit - IV

4. a) What is page fault? What are the steps taken by OS to overcome this situation? (6)
- b) Consider the following page reference  
1, 2, 3, 2, 5, 6, 3, 4, 6, 3, 7, 3, 1, 5, 3, 6, 3, 4, 2, 4, 3, 4, 5, 1. (10)  
Calculate total no. of page faults for
- i) LRU
  - ii) Optimal
  - iii) FIFO
- specify best technique assuming total no. of frames as 4.

### OR

- a) In demand paged memory, 200 m sec are required to satisfy memory request if the page is in memory. If the page is not in the memory, request takes 7m sec if a free frame is available. It takes 15 m sec if the page to be swapped out has been modified.
- What is the effective access time if the page fault rate is 5% and 60% of the time page to be replaced has been modified.

**6E3018**

Roll No. \_\_\_\_\_

[Total No. of Pages : 3]

**6E3018****B.Tech. Vith Semester (Main/Back) Examination, June - 2010****Computer Engineering  
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 may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

**Unit - I**

1. a) Suppose we restrict DFA so that they have at most one accepting state. Can any regular language  $L$  be recognized by this restricted form of DFA? Justify your answer? (8)
- b) For the following NFA find equivalent DFA. (8)

State	Inputs	
	0	1
$\rightarrow q_0$	$\{q_0, q_1\}$	$\{q_0, q_3\}$
$q_1$	$\{q_2\}$	$\phi$
$\textcircled{q_2}$	$\phi$	$\phi$
$q_3$	$\phi$	$\{q_4\}$
$\textcircled{q_4}$	$\phi$	$\phi$

OR

a) Construct a Mealy machine with  $\Sigma = \Delta = \{0,1\}$ . The output is 1 whenever the last four symbols read are 1111. Overlapping sequence are accepted. Output is 0 otherwise. (8)

(2×4=8)

b) Let  $\Sigma = \{a,b,c\}$

i) Draw a DFA that rejects all words for which the last two letters match.

ii) Draw a DFA that rejects all words for which the first two letters match.

Unit - II

2. a) Write regular expression for each of the following language over the alphabet  $\{a, b\}$ . (4×2=8)

i) The set of strings containing  $ab$  as a substring.

ii) The set of string having at most one pair of consecutive  $a$ 's and at most one pair of consecutive  $b$ 's.

iii) The set of string whose length is divisible by 6.

iv) The set of string whose 5<sup>th</sup> last symbol (5<sup>th</sup> symbol from the end) is  $b$ .

b) By using pumping lemma prove that  $L = \{a^n : n \geq 0\}$  is not regular. (8)

OR

a) Prove the following identity  $(a^*ab+ba)^*a^* = (a+ab+ba)^*$ . (8)

b) Are the following true or false? Support your answer by giving proofs or counter examples : (4+4=8)

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

ii) If  $L^*$  is regular then  $L$  is regular.

Unit - III

3. a) Show that grammar  $S \rightarrow aB \mid ab, A \rightarrow aAB \mid a, B \rightarrow ABb \mid b$  is ambiguous. (6)

b) What is difference between context free language and Deterministic context free language. Give example of both language. (4)

c) If  $L$  is context free language and  $R$  being regular then prove. (3+3=6)

i)  $L \cap R$  is context free.

ii)  $L - R = L \cap \bar{R}$  is also a context free.

OR

a) Find a grammar in chomsky normal form equivalent to  $S \rightarrow aAbB, A \rightarrow aA \mid a, B \rightarrow bB \mid b$ . (8)

Find a PDA (which accepts Via final state)

### Unit - IV

4. a) Construct a Turing Machine over an alphabet  $\{0, 1, \#\}$ , where 0 indicates blank, which takes a non null string of 1's and #'s and transfers the right most symbol to the left hand end. Thus ..... 000 # 1 # 1 # 1000 becomes .....0001 # 1# 1 # 000.  
The Head is initially at the leftmost non blank symbol. (8)
- b) Explain the following : (4+4=8)
- i) Subroutines
  - ii) Closure properties of recursive and Recursively enumerable language.

OR

- a) Make the comment on the following statement finite state machine with two stack is as powerful as Turing Machine. (4)
- b) Explain the following : (2+2=4)
- i) Universal Turing Machine
  - ii) Rice Theorem.
- c) Design a Turing Machine that accepts  $\{0^n 1^n / n \geq 1\}$ . (8)

### Unit - V

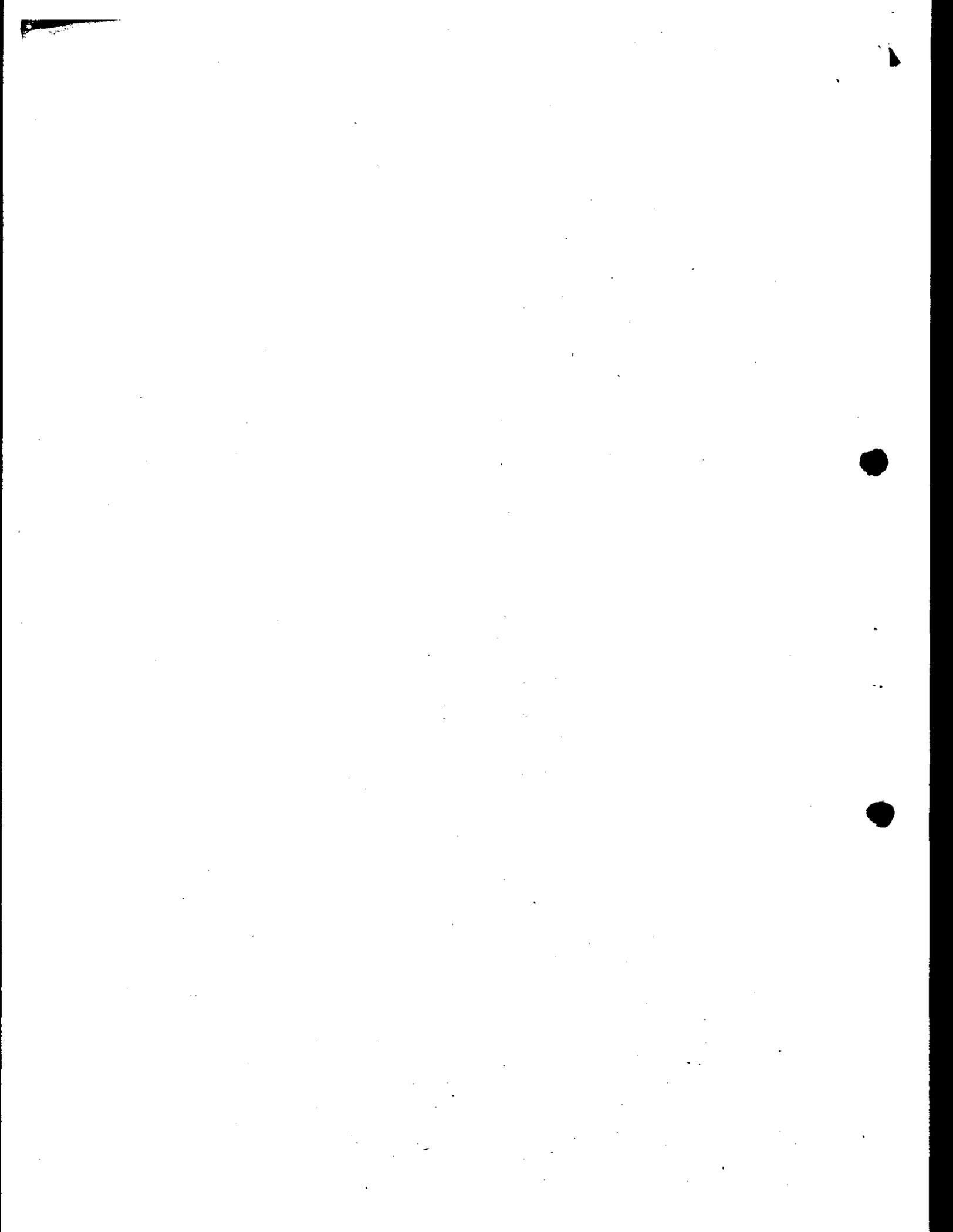
5. a) Explain the model of Linear Bounded Automata. (6)
- b) Find the grammar generating the set accepted by a linear bounded Automata  $M$  whose transition table as follows. (10)

Present state	Tape input Symbol			
	$\phi$	\$	0	1
$\rightarrow q_1$	$cRq_1$		$1Lq_2$	$0Rq_2$
$q_2$	$cRq_4$		$1Rq_3$	$1Lq_1$
$q_3$		$\$Lq_1$	$1Rq_3$	$1Rq_3$
$\textcircled{q_4}$		Halt	$0Lq_4$	$0Rq_4$

OR

Prove the following closure properties of context sensitive language : (4×4=16)

- |                    |                 |
|--------------------|-----------------|
| a) Union           | b) Intersection |
| c) Complementation | d) Transpose.   |



6E3017

Roll No. \_\_\_\_\_

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6E3017

**B.Tech. VIth Semester (Main/Back) Examination, June - 2010**

**Computer Engineering**

**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 may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

**Unit - I**

1. Categorize embedded systems. Describe requirements of embedded systems.

**OR**

Describe applications of embedded systems in biomedical systems and communication devices.

**Unit - II**

2. Describe embedded system development process in detail taking a suitable example.

**OR**

Describe various interface standards in detail.

**Unit - III**

3. Describe any software estimation tool in detail.

**OR**

Describe interfacing of 8051 with LCD, ADC, sensors, and key board.

#### Unit - IV

4. Describe in detail how simulation of a process control system can be done.

**OR**

Describe embedded database applications using energy meter reading as an example.

#### Unit - V

5. Describe tools available for building embedded systems taking a case study.

**OR**

Describe main features of PIC16F873 processor.

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6E3020

Roll No. \_\_\_\_\_

[Total No. of Pages : 2]

6E3020

**B.Tech. Vth Semester (Main/Back) Examination, June - 2010**

**Computer Engineering**

**6CS6.2 Advanced Software Engineering**

**Time : 3 Hours**

**Maximum Marks : 80**

**Min. Passing Marks : 24**

**Instructions to Candidates:**

*Attempt carry 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.)*

**Unit - I**

1. a) Define Software configuration management (SCM) and explain some issues related to SCM. Why is SCM required? (12)
- b) Explain the term "Maintenance side - effects". (4)

**OR**

- a) What is software quality? Why do we require it? What is the role of software quality assurance in development system. (12)
- b) Explain software complexity. (4)

**Unit - II**

2. a) Explain software testing and the behavioral properties of software testing. (8)
- b) What do you mean by cyclomatic complexity? How it useful in generating the test cases. (8)

**OR**

- a) Write the functional specifications of an ideal debugger for an object oriented programming language. (8)
- b) Describe various types of program bugs and explain the debugging process. (8)

### Unit - III

3. a) What do you mean by International standards? List any two standards. Differentiate between ISO - 9126 and ISO - 12207. (12)
- b) Write short note on decision - making. (4)

OR

- a) What do you mean by leadership? What qualities must a project leader have to lead his team? (10)
- b) Explain the various roles in the organisation structure of software industry. (6)

### Unit - IV

4. a) Explain different types of testing that are used to test Web App. (10)
- b) Explain Web E process model. (6)

OR

How do you judge the quality of a Website? Make a list of ten quality attributes that you believe are most important.

Differentiate WebApp design pattern with template. (16)

### Unit - V

5. Describe the general model of software re-engineering. Differentiate between software engineering and software re-engineering. Also differentiate between forward engineering and reverse engineering. (16)

OR

What do you mean by CASE tools of CASE environment? Discuss the classification of CASE tools in detail. (16)

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**6E3014**

Roll No. \_\_\_\_\_

[Total No. of Pages : 4]

**6E3014**

**B. Tech. VIth Semester (Main/Back) Examination, June - 2010**  
**Computer & IT**  
**Operating Systems (Common for 6CS1 & 6IT1)**

**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.)*

**Unit - I**

1. a) What is an operating system? Explain the salient features of various types of operating systems by taking suitable examples from present day operating system. (10)
- b) What are system calls? Describe different types of system calls. (6)

**OR**

- a) Consider the following set of processes with the length of CPU - burst time given in (m sec).

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

- i) Draw 4 gantt charts illustrating the execution of these processes using FCFS, SJF, non preemptive priority (a smaller priority number implies a higher priority) and RR (quantum = 1) scheduling.
  - ii) What is the turnaround time of each process for each of the scheduling algorithms in part (i) ?
  - iii) What is the waiting time of each process for each of the scheduling algorithm in part (i)?
  - iv) Which of the schedules in part (i) results in the minimal average waiting time. (4,2,2,2)
- b) Differentiate
- i) multitasking, multiprocessing & multi programming. (6)
  - ii) hard real time and soft real time OS.

**Unit - II**

2. a) What is the difference between a program and a process? With the help of state transition diagram, explain various states of a process. (8)
- b) Explain producer consumer problem. How it is solved using semaphores? (8)

**OR**

- a) Consider following snap shot of a system

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using Banker's algorithm.

- i) What is the content of Matrix 'Need'?
- ii) Is system in safe state? Find safe sequence.
- iii) If a request from process P1 arrives for (0,4,2,0) can request be granted (3,4,3)