

10. (a) If L is accepted by an NFA with ϵ -transitions prove that L is accepted by an NFA without ϵ -transitions.

Or

(b) Show that the Boolean expressions are equivalent to one another. Obtain their sum-of-products of canonical form :

$$(i) \quad (x \oplus y) * (x' \oplus z) * (y \oplus z)$$

$$(ii) \quad (x * z) \oplus (x' * y).$$

11. (a) Prove that CFL $L = \{a^n b^n c^m d^m / n_1 m \geq 1\} u$ $\{a^n b^m c^m d^n / n_1 m \geq 1\}$ is inherently ambiguous.

Or

(b) Prove that if L is a language for some PDA M then L is a context - free language.

1712/R10

MAY 2008

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCES

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions.

1. (a) Show that

$$\neg(P \vee (Q \wedge R)) \iff ((P \vee Q) \wedge (P \vee R))$$

Or

(b) Obtain the principal disjunctive normal forms of $(P \wedge Q) \vee (\neg P \wedge R) \vee (Q \wedge R)$.

2. (a) Show that

$$((P \rightarrow (Q \rightarrow R)) \rightarrow ((P \rightarrow Q) \rightarrow (P \rightarrow R)))$$

Or

(b) Show that $\sum (\neg Q \wedge (P \rightarrow Q)) \rightarrow \neg P$

3. (a) For any commutative monoid $\langle M, * \rangle$ prove that the set of idempotent element of M forms a submonoid.

Or

(b) Define Homomorphism with an example.

4. (a) Prove that every row or column in the composition table of a group $\langle G, * \rangle$ is a permutation of the element of G .

Or

(b) Let $S = \{a, b, c\}$. Draw a Hanedigraph with $\langle P(S), \subseteq \rangle$.

5. (a) In a Boolean algebra, prove that

$$(a + b)(a' + c) = ac + a'b = ac + a'b + bc.$$

Or

(b) In a lattice, prove that

$$(a * b) \oplus (b * c) \oplus (c * a) \leq (a \oplus b) * (b \oplus c) * (c \oplus a).$$

6. (a) Let $M = (\{q_0, q_1\}, \{0, 1\}, \delta, q_0, \{q_1\})$ be an NFA where $\delta(q_0, 0) = \{q_0, q_1\}$, $\delta(q_0, 1) = \{q_1\}$, $\delta(q_1, 0) = \emptyset$, $\delta(q_1, 1) = \{q_0, q_1\}$. Find DFN.

Or

(b) Construct finite state automata equivalent to the regular expression $01[(10)^* + 111]^* + 0]1$.

7. (a) Prove that the class of regular sets is closed under quotient with arbitrary sets.

Or

(b) Consider the grammar $G = (V_1, T_1, p, s)$ where $V = \{s\}$, $T = \{a, b\}$ and $p = \{S \rightarrow asb, s \rightarrow ab\}$. Find the language $L(G)$.

PART B — (4 × 10 = 40 marks)

Answer ALL questions.

8. (a) Show that

$$((P \vee Q) \wedge \neg(\neg P \wedge (\neg Q \vee \neg R))) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$$

is a tautology.

Or

(b) Show that

$$(x)(P(x) \vee Q(x)) \Rightarrow (x) P(x) \vee (\exists x)Q(x).$$

9. (a) If $f : G \rightarrow G'$ is a homomorphism, prove that the Kernel of f is a normal subgroup of G .

Or

(b) Let H be a subgroup of a group G . Define Left and right cosets of H and prove that any two left cosets of H are either identical or disjoint.

ACCOUNTING AND FINANCIAL MANAGEMENT

(For those who joined in July w.e.f 2006 and after)

Time : Three hours

Maximum : 75 marks

SECTION A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

1. (a) “Every debit has got a credit and vice-versa” explain the significance of this statement and give suitable examples.

Or

- (b) Differentiate Journal from Ledger.

2. (a) What are closing entries?

Or

- (b) Explain the various types of ratios.

3. (a) Differentiate between "Financial accounting and cost accounting".

Or

(b) Explain the elements of costing in a brief manner.

4. (a) Journalise the following:

(i) Arul commenced business with Rs. 21,000

(ii) Bought goods for cash Rs. 9,200

(iii) Sold goods to Kannan on credit Rs. 5,600

(iv) Purchased goods from Mani Rs. 3,300

(v) Received cash from kannan Rs. 3,600

Or

(b) From the following particulars, prepare a bank reconciliation statement as on 31st December, 2000.

(i) Bank balance as per cash book as on 31.12.2000 Rs. 5,400.

(3) 600 units of 'X' and 200 units

of 'Y'

(4) 450 units of 'X' and 300 units

of 'Y'

The chief accountant has ascertained the following information :

Particulars	Material 'X'	Material 'Y'
	Rs	Rs.
Direct material	5	6.25
Selling price	15	25
Direct labour at 25 paise per Hour	10 Hrs	15 Hrs
Variable overheads 100% of labour		
Fixed overheads Rs. 5,000		

Or

(b) What are the advantages and limitations of standard costing?

(ii) Cheques issued but not presented for payment Rs. 515.

(iii) Cheques deposited into Bank but not credited in the pass book Rs. 240.

(iv) Bank charges debited in pass book Rs. 30.

(v) Interest on current a/c credited by the bank but not yet recorded in the cash book Rs. 25.

5. (a) From the following profit and loss a/c calculate funds from operations:

	P&L a/c	
To expenses paid	3,000	By gross profit 45,000
To Depreciation	7,000	By gain on sale of land 6,000
To loss on sale of machine	2,400	
To discount	1,200	
To good will	12,000	
To Net profit	25,400	
	<u>51,000</u>	<u>51,000</u>

Or

(b) Determine the value of closing stock from the following details:

Sales Rs. 4,00,000

G.P. ratio : 10% on sales

Stock velocity = 4 times

Closing stock was Rs. 10,000 in excess of opening stock.

6. (a) Record the following transactions in the stores ledger pricing the materials under FIFO method.

May 1 Balance 500 units at Rs. 25
per unit.

May 3 Received 300 units at Rs. 30
per unit

May 5 Issued 200 units

May 7 Issued 120 units

May 8 Received back 10 units issued on
May 7.

Or

Reorder period : 'P' = 4 to 6 weeks

'Q' = 2 to 4 weeks

Calculate for each component :

- (i) Re-order level
- (ii) Minimum level
- (iii) Maximum level
- (iv) Average level

Or

(b) Discuss the essentials of a good system of wage payment.

11. (a) The management of 'B' company ltd are considering the sales budget for the next budget period. You are required to present to the management a statement showing :

- (i) The marginal cost of each product
- (ii) To recommend which of the following sales mixes should be adopted

(1) 900 units of 'X'

(2) 600 units of 'Y'

(b) Prepare a fund flow statement from the following figures:

Particulars	31.12.94	31.12.93	Particulars	31.12.94	31.12.93
Assets			Liabilities		
Cash	40,000	1,30,000	creditors	3,65,000	3,19,000
Debtors	1,60,000	1,00,000	Provision		
Stock and			for dividend	2,00,000	—
work in			Long term	5,35,000	—
progress	2,55,000	2,35,000	loan		
Land and			Equity		
building	10,20,000	5,40,000	capital	40,00,000	36,00,000
Plant and			Surplus	1,29,000	1,00,000
Machinery	35,44,000	28,04,000			
Furniture and					
fittings	2,10,000	2,10,000			
	<u>52,29,000</u>	<u>40,19,000</u>		<u>52,29,000</u>	<u>40,19,000</u>

10. (a) Two components 'P' and 'Q' are used as follows:

Normal usage – 300 units per week

Maximum usage – 450 units per week

Minimum usage – 150 units per week

Reorder quantity : 'P' = 2400 units

'Q' = 3,600 units

(b) From the following data calculate the total wages of a worker under Halsey premium plan.

Hourly rate – Rs. 3

Standard time – 16 Hrs

Time taken – 12 Hrs

7. (a) What are the salient features of marginal costing?

Or

(b) Write a note on "Variance analysis".

SECTION B — (4 × 10 = 40 marks)

Answer ALL questions.

8. (a) Explain the meaning and purpose of subsidiary books. Mention the various subsidiary books used.

Or

(b) From the following trial balance of Ravi prepare trading and profit and loss a/c. For the year ended December 31st 1993 and a balance sheet as on that date.

Trial Balance		
Particular	Debit	Credit
Capital	–	40,000
Sales	–	25,000
Purchases	15,000	
Salaries	2,000	
Rent	1,500	
Insurance	300	
Drawings	5,000	
Machinery	28,000	
Bank balance	4,500	
Cash	2,000	
Stock (1.1.93)	5,200	
Debtors	2,500	
Creditors	–	1000
	<u>66,000</u>	<u>66,000</u>

Adjustments :

- (i) Stock on 31.12.93 – 4,900
- (ii) Salaries unpaid – 300
- (iii) Rent paid in advance – 200
- (iv) Insurance prepaid – 90

9. (a) From the following forecast information Prepare cash budget for the months April, May and June 1997. Balance of cash on 1st April is 8,000.

Months 1997	Sales Rs.	Purchases Rs.	Expenses on wages Rs.	Other expenses Rs.
February	90,000	66,000	4,000	6,000
March	80,000	60,000	4,000	6,000
April	96,000	88,000	6,000	7,000
May	1,00,000	60,000	5,000	8,000
June	1,20,000	70,000	6,000	7,200

Additional informations :

- (i) Customers are allowed a credit period of one month.
- (ii) Creditors allow a time – lag of two months for making payments.
- (iii) Wages of a month are paid next month.
- (iv) Other expenses are paid in the next month.

Or

11. (a) Write a program to create a file of student's information with their marks details.

Or

(b) Write a C program to copy the contents of one file to another.

1714/R12

MAY 2008

PROGRAMMING IN C

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

1. (a) Differentiate increment and decrement operator.

Or

(b) Write a C program to read a line of text from the terminal.

2. (a) Determine the value of given logical expression, if $a = 5$; $b = 10$; $c = -6$.

(i) $a > b \ \&\& \ a < c$

(ii) $a == c \ || \ b > a$

Or

(b) Draw flow chart for the selection process of switch statement explain with an example.

3. (a) Distinguish between the following:

- (i) Actual and formal arguments
- (ii) Global and local variables

Or

(b) Explain the use of "go to" statement.

4. (a) Write a program to find the roots of a quadratic equation.

Or

(b) Write a note on macros.

5. (a) Distinguish between array of pointers and pointer to a group of arrays.

Or

(b) Write notes on dynamic memory allocation.

6. (a) What is Union? Explain with an example.

Or

(b) Explain the basic file operations.

7. (a) Write notes on unformatted data files.

Or

(b) Write notes on self-referential structures.

PART B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

8. (a) Explain the structure of C program with an example program.

Or

(b) Write a function prime that returns 1, if its argument is a prime number and returns 0 otherwise.

9. (a) (i) Explain the FOR Loop with suitable example and a programming example program.

(ii) Write a program to determine whether a given matrix is Unit Matrix or not.

Or

(b) What is the use of typedef in C? Explain with an example.

10. (a) Explain the difference between "Call by reference" and "Call by value" with Suitable example.

Or

(b) Write a C program to find the product of 2 matrices.

9. (a) Briefly explain gated R-S flip flop using NOR and NAND gates.

Or

(b) Explain the working of BCD counter.

10. (a) Explain the following :

- (i) Shift micro operation
- (ii) Logic microoperation.

Or

(b) Explain how the memory mapped I/O differs from isolated I/O.

11. (a) Briefly explain sequencing of control signals in microprogrammed control.

Or

(b) What is addressing mode? Explain PDP - 11 addressing modes and instructions.

1715/R13

MAY 2008

**DIGITAL PRINCIPLES AND COMPUTER
ORGANISATION**

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

All questions carry equal marks.

1. (a) State and prove Boolean theorems.

Or

(b) Multiply the following:

- (i) 110110×1100
- (ii) 111×101 .

2. (a) Convert the equation $Y = \overline{AB} + AB + AC$ into a POS form.

Or

(b) Reduce $ABC + A\overline{B}C + A\overline{B}C + A\overline{C}$.

3. (a) Explain R-S flip flop with an examples of a possible sequence of input signals.

Or

(b) Explain binary half-adder.

4. (a) Add the following 1's complement number

(i) +0011

+0100

(ii) +1001

-0100

(iii) +1011

-1011

(iv) +0011

-1100

Or

(b) Explain shift operation.

5. (a) Explain memory location in detail.

Or

(b) Explain the prefetching of micro instructions in a processing unit.

6. (a) Explain :

(i) Static and Dynamic RAM

(ii) VAX-11 virtual memory.

Or

(b) Discuss on Interrupts.

7. (a) Explain grouping of control signals.

Or

(b) Explain main memory operation.

PART B — (4 × 10 = 40 marks)

Answer ALL questions.

All questions carry equal marks.

8. (a) (i) Explain how BCD addition is carried out with an example.

(ii) What are the basic rules and properties of Boolean Algebra?

Or

(b) Design a NOR gate combinational network for the Boolean algebra function in

$ABCD + ABC\bar{D} + \bar{A}BCD + \bar{A}B\bar{C}D + ABC\bar{D} + \bar{A}BCD$,
again using as few gates as you can.

(a) How to conduct a meeting?

Or

(b) Your currently working as a teacher of computer science in a school. You want to find an entry in to a reputed IT company as an analyst. Prepare your resume with relevance to the profession.

1716/R14

MAY 2008

COMMUNICATION SKILLS

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions.

1. (a) What are the classes of words generally do not take stress?

Or

(b) What should one do during the interview?

2. (a) Write a brief note on Comprehension.

Or

(b) Suggest some possible ways to improve reading skills.

3. (a) State some changes that takes place when converting a direct speech to indirect speech.

Or

(b) Passive voice and its rules.

4. (a) Explain SVO pattern with examples.

Or

(b) Write a short note on prefixes.

5. (a) Write a paragraph on report making.

Or

(b) When and why do you consult a dictionary?

6. (a) What are the steps to be followed while summarising a text?

Or

(b) What are the steps involved in note making?

7. (a) Write some expressions which we use to request or ask for permission.

Or

(b) Correct the following sentences and rewrite them :

(i) I prefer hot coffee than cold drinks.

(ii) Seema was seeing T.V. when the lights went off.

(iii) He has sent all his furnitures to his new house.

(iv) My father has gone to Delhi yesterday.

(v) Neither of the teams were involved in the incidents.

Answer ALL questions.

8. (a) Define English Consonants.

Or

(b) Intonations and its uses.

9. (a) Write the rules with examples involved in agreement between subject and verb.

Or

(b) Explain Passive Voice.

10. (a) Narrate how word formation is made.

Or

(b) Elucidate why punctuation is necessary in writing.

9. (a) Prove that a spanning tree T of a given weighted connected graph G is a shortest spanning tree of G if and Only if there exists no other spanning tree of G at a distance of one from T whose weight is smaller than that of T .

Or

(b) Prove that a graph has a dual if and only if it is planar.

10. (a) If $A(G)$ is an incidence matrix of a connected graph G with 'n' vertices, then prove that the rank of $A(G)$ is ' $n-1$ '.

Or

(b) State and Prove the Five Colour Theorem.

11. (a) Prove that the complete graph of five vertices is non-planar.

Or

(b) State and Prove the Polya's Counting Theorem.

GRAPH THEORY

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

All questions carry equal marks.

1. (a) There are 16 books on a bookshelf. In how many ways can 6 of these books be selected if a selection must not include two neighbouring books?

Or

(b) Prove that $n = C(n-r) = nCr$.

2. (a) Prove that a graph G is disconnected if and only if its vertex set V can be partitioned into two nonempty, disjoint subsets V_1 and V_2 such that there exists no edge in G whose one end vertex is in subset V_1 and the other in subset V_2 .

Or

(b) Prove that in a connected graph G with exactly ' $2k$ ' odd vertices, there exists ' k ' edge-disjoint subgraphs such that they together contain all edges of G and that each is a Unicursal graph.

3. (a) Prove that in any tree with two or more vertices, there are at least two pendant Vertices.

Or

(b) Prove that every connected graph has at least one Spanning tree.

4. (a) Prove that with respect to a given spanning tree T , a chord c_i that determines a fundamental circuit Γ occurs in every fundamental cut-set associated with the branches in Γ and in no other.

Or

(b) Prove that the maximum flow possible between two vertices 'a' and 'b' in a network is equal to the minimum of the capacities of all cut-sets with respect to 'a' and 'b'.

5. (a) Prove the following for any simple, connected, planar graph with 'f' regions, 'n' vertices and 'e' edges ($e > 2$).

(i) $e \geq (3/2)f$

(ii) $e \leq 3n - 6$.

Or

(b) Define incidence and adjacency matrices. Give suitable examples.

6. (a) Prove that every tree with two or more vertices is 2-chromatic.

Or

(b) Prove that a graph with at least one edge is 2-chromatic if and only if it has no circuits of odd length.

7. (a) Prove that in any digraph G the sum of all in-degrees is equal to the sum of all out-degrees, each sum being equal to the number of edges in G .

Or

(b) Describe any two application of graphs in Computer Science.

PART B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

All questions carry equal marks.

8. (a) Prove that a simple graph with 'n' vertices and 'k' components can have at most $(n-k)(n-k+1)/2$ edges.

Or

(b) Prove that a given connected graph G is an Euler graph if and only if all vertices of G are of even degree.

SOFTWARE ENGINEERING

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

1. (a) Give the definition of Software Engineering and discuss about the paradigms of Software Engineering.

Or

(b) Explain the distribution of effort in the software life cycle.

2. (a) Explain about goals and requirements Software Engineering.

Or

(b) What is content of an architectural design specification?

3. (a) Write short notes on Delphi cost estimation.

Or

(b) In what way programmer ability influence software cost?

4. (a) What are desirable properties involved in software requirements specification? Explain.

Or

(b) Explain about PSA.

5. (a) What is Information Hiding? In what way it is useful for software development?

Or

(b) Write short notes on Structure.

6. (a) Write down difference between validation and verification.

Or

(b) What is unit testing? Explain.

7. (a) Write short notes on design activities in software maintenance.

Or

(b) What is primary function of quality assurance group during software maintenance?

PART B — (4 × 10 = 40 marks)

Answer ALL questions.

8. (a) Describe the different categories of project size.

Or

(b) Explain any three factors that influence quality and productivity.

9. (a) What are the steps required to plan a software project?

Or

(b) Explain the format of a software requirement specifications.

10. (a) Write down cost estimation procedure using COCOMO.

Or

(b) Explain about formal specification techniques.

11. (a) Explain about design notations in software design.

Or

(b) What are the benefits observed from walk through?

RELATIONAL DATABASE MANAGEMENT SYSTEM

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions.

1. (a) Explain the duties of database administrators.

Or

- (b) Explain Secondary storage devices.

2. (a) Explain subclass and super class.

Or

- (b) Differentiate DBA with data base designer.

3. (a) Explain Keys constraints.

Or

- (b) Explain update operation on relation.

4. (a) Explain is data Independence.

Or

(b) What are languages and interfaces available?

5. (a) Explain architecture of DBMS with neat diagram.

Or

(b) Write a note on the expressions and formula in Tuple relational Calculus.

6. (a) Explain the characteristics of relations.

Or

(b) Write a note on the Schema and Catalog concepts in SQL2.

7. (a) Explain several of categories of end users.

Or

(b) Define Entity, Attributes, Relationship.

PART B — (4 × 10 = 40 marks)

Answer ALL questions.

8. (a) Discuss the characteristics of database approach.

Or

(b) Explain three schema Architecture and Data Independence.

9. (a) Explain runtime supervisor and stored Data Manager.

Or

(b) Write any five steps involved in Data Manipulation of DB2.

10. (a) (i) Write uses of embedded in SQL in DB2.

(ii) Explain the First Normal form.

Or

(b) Explain object definition and Object Query Languages.

11. (a) Discuss the functional dependencies.

Or

(b) Explain Object definition and Object Query Languages.

11. (a) Define a class string use overloaded == operator to compare two string.

Or

(b) Discuss how super fast spelling checker can be implemented in C++.

1720/R18

MAY 2008

OBJECT ORIENTED PROGRAMMING AND C++

(For those who joined in July 2006 and after)

Time : Three hours

Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL the questions.

1. (a) Discuss the principal advantages of OOP.

Or

(b) What do you mean by dynamic initialization of a variable? Give an example.

2. (a) What is a class? How does it accomplish data hiding?

Or

(b) A friend function cannot be used to overload the assignment operator =. Explain why.

3. (a) Explain about messages, member functions and data members.

Or

- (b) Explain container ship of class and nested class.

4. (a) Implement linked list creation and addition operation using C++.

Or

- (b) Discuss the characteristic of friend function.

5. (a) What is THIS pointer? Given an example.

Or

- (b) Write a C ++ program to add two given complex numbers using operator overloading.

6. (a) What are manipulators? List out the various manipulators supported by C++.

Or

- (b) Write a C ++ program to read an integer number and find the sum of all the digits until it reduces to a single digit using a constructor.

7. (a) Explain the difference between passing arguments “by reference” and “by address” to function.

Or

- (b) Describe the different styles of writing prototypes with example.

PART B — (4 × 10 = 40 marks)

Answer ALL the questions.

8. (a) Explain in detail the application of object oriented programming.

Or

- (b) What is a friend function? What are the merits and demerits of using friend function?

9. (a) What are the different forms of inheritance? Give an example for each.

Or

- (b) Consider a shopping list of items for which place an order with a dealer every month. The list includes details such as the code number, price of each item. Write a C++ program using class to perform the operation like adding an item to the list, deleting items from the list, printing the total value and display all items.

10. (a) Write a C ++ program to illustrate virtual function.

Or

- (b) Explain the different types of constructors with examples.

10. (a) Explain the different types of software architectures for embedded systems.

Or

(b) Write an essay on the features of the real time embedded system.

11. (a) Discuss the features of the real embedded system.

Or

(b) Write an essay on the design challenges in embedded application design.

1721/R19

MAY 2008

MICROPROCESSORS AND EMBEDDED SYSTEMS

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

All questions carry equal marks.

1. (a) Explain any five flag registers.

Or

(b) Enumerate the advantages of SSB over AM.

2. (a) Explain troubleshooting a fault in a microprocessor.

Or

(b) Explain data transfer instructions with suitable examples.

3. (a) Write the steps needed to execute a subroutine call.

Or

(b) Illustrate the use of subroutine with suitable programming example.

4. (a) Explain the components of an IBM PC system Unit.

Or

(b) Write a note on ROM selection.

5. (a) What are the five main timing signals used by an IBM PC system.

Or

(b) Explain the functions of system board.

6. (a) Explain Operating system in Embedded systems.

Or

(b) Explain any five built-in self tests in embedded systems.

7. (a) Write the characteristics of an embedded system. Explain how is it different from Desk top computing.

Or

(b) Write a note on Cross assemblers, OCD and In-Circuit Emulators.

PART B — (4 × 10 = 40 marks)

Answer ALL questions.

All questions carry equal marks.

8. (a) Explain

(i) Timing Bus cycle

(ii) Read Bus cycle

(iii) Write Bus cycle and

(iv) Fetch-Execute cycle.

Or

(b) Explain

(i) Data transfer Instructions

(ii) Arithmetic Instructions

9. (a) (i) Explain subroutine with suitable programming example.

(ii) Write an assemble language program to computer $Z = (A + B) C$ using subroutine.

Or

(b) Describe the functionalities of 8255 PPI with its pin out diagram.

OPTIMIZATION TECHNIQUES

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

1. (a) Explain any two underlying assumptions of LPP that limits its applicability.

Or

- (b) (i) State the properties of standard LP form

(ii) Define slack variable.

2. (a) Explain graphical procedure to solve an LPP.

Or

- (b) Explain degeneracy and cycling with example.

3. (a) Explain branch and bound method.

Or

- (b) Explain zero-one programming problem.

4. (a) Write a note on the classification of stochastic processes.

Or

- (b) Explain transition probability matrix with suitable example.

5. (a) Explain arrival characteristics.

Or

- (b) Explain various measures of performance in the steady state.

6. (a) In $(M/M/1:GD/\infty/\infty)$, prove that the probability distribution that there are n customers in the system is geometric.

Or

- (b) For $(M/M/2):(\infty \text{ FIFO})$ queuing model find p_0, p_1 and $p(n > 2)$ if $\lambda = 5/\text{hour}$ and $\mu = 4/\text{hour}$.

7. (a) State and prove any two properties of Z-transforms.

Or

- (b) With usual notation, prove that $Z(p_{n+1}) = 1/z\{p(z) - p_0\}$

(i) What is the probability that a customer will not have to wait for services?

(ii) What is the expected number of customers in the system?

(iii) Computer L_q, W_s, W_q .

Or

(b) A super Market has three girls ringing up sales at the counters. If the service time for each customer is exponential with mean 5 minutes and if people arrive in Poisson fashion at the rate of 15 an hour find

(i) the probability of having to wait for service

(ii) the expected percentage of idle time for each girl

(iii) the average queue length as the average number of units in the system.

11. (a) In $(M/M/2) : (GD/\infty/\infty)$, mean service time is 5 minutes and mean inter arrival time is 8 minutes Find

(i) the probability of a delay

(ii) the probability of at least one of the servers being busy

(iii) the probability that both servers are idle.

Or

(b) Customers arrive at a one-person barber shop according to a Poisson process with a mean inter-arrival time of 20 minutes, customers spend an average of 15 minutes in the barber chair

(i) the probability a customer will not have to wait for a hair-cut

(ii) the expected number of customers in the barber shop

(iii) the expected time taken by a customer to spend in the barber shop.

PART B — ($4 \times 10 = 40$ marks)

8. (a) Solve the following LPP using graphical procedure :

$$\text{Maximize } z = 2x_1 + 3x_2$$

Subject to

$$2x_1 + x_2 \leq 6$$

$$x_1 + 2x_2 \leq 8$$

$$x_1 - x_2 \leq 1$$

$$x_1 \leq 2$$

$$x_1, x_2 \geq 0.$$

Or

(b) Solve the following LPP using simplex method :

$$\text{Maximize } z = 5x_1 + 7x_2$$

Subject to

$$2x_1 + x_2 \leq 6$$

$$3x_1 + 4x_2 \leq 12.$$

$$x_1, x_2 \geq 0$$

9. (a) Solve the following integer Linear programming problem :

$$\text{Maximize } z = x_1 + 5x_2$$

Subject to

$$x_1 + 10x_2 \leq 20$$

$$x_2 \leq 2$$

$$x_1 \leq 2.$$

x_1, x_2 are nonnegative integers.

Or

(b) Obtain an optimal solution of the assignment problem.

	I	II	III	IV	V
1	11	17	8	16	20
2	9	7	12	6	15
3	13	16	15	12	16
4	21	24	17	28	26
5	14	10	12	11	15

10. (a) Customer arrive at a service section according to a Poisson process with a mean interval time of 30 minutes. The service time is distributed as exponential with mean service time 15 minutes.

11. (a) Explain Depth-Buffer method with the steps used in this method.

Or

(b) Explain different type of projection of 3-D rotation with respect to the three axes.

1723/R21

MAY 2008

COMPUTER GRAPHICS

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

1. (a) Explain Raster-Refresh display devices.

Or

(b) Write note on three dimensional monitor.

2. (a) Write DDA algorithm.

Or

(b) List two interactive graphical input devices with their applications.

3. (a) Explain various area filling commands.

Or

(b) Explain bundled attributes.

4. (a) Explain any one character attributes.

Or

(b) Write the equations of rotation and its matrix form.

5. (a) Explain multiple window and view point commands.

Or

(b) Explain an one interactive input method.

6. (a) Explain three dimensional coordinate systems.

Or

(b) Define segment and its attributes.

7. (a) Explain three dimensional scaling with its matrix.

Or

(b) Explain rubber band methods and dragging techniques.

PART B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

8. (a) Write note on :

(i) Printers and

(ii) Plotters.

Or

(b) Explain an three display processors.

9. (a) Explain mid point circle algorithm. Illustrate the use of this algorithm to determine the position along the circle octant in the first quadrant from $x = 0$ to $x = y$ in a circle of radius 10.

Or

(b) Explain :

(i) Mid point subdivision clipping algorithm and

(ii) Text clipping algorithm.

10. (a) Explain the logical classification of input devices.

Or

(b) Explain an two input modes.

✓ SYSTEM ANALYSIS AND DESIGN

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

Answer ALL questions.

PART A — ($7 \times 5 = 35$ marks)

1. (a) Explain the role of a system analyst.

Or

- (b) Explain the categories of automated system.

2. (a) What are various kinds of costs?

Or

- (b) Explain the importance of the analysis in the system development life cycle.

3. (a) Explain the relationship diagram in system analysis.

Or

- (b) Explain the main components of a data flow diagram.

4. (a) Explain the ways of gathering information.

Or

(b) Explain two types of recursive relationships.

5. (a) Explain Hierarchical model.

Or

(b) Explain bottom up variant of software design.

6. (a) How do you distinguish between logical and physical design?

Or

(b) Explain the main components of computer-user interface design.

7. (a) Explain the concept of structure design.

Or

(b) What are the vendor maintenance support?

PART B — (4 × 10 = 40 marks)

8. (a) Write an essay on various requirements when designing information system.

Or

(b) Discuss the steps involved in physical design in file system.

9. (a) Discuss the cost benefit analysis in the development of a system.

Or

(b) Explain the steps in feasibility analysis.

10. (a) Discuss three main tools used in the analysis of data usage and logical navigation.

Or

(b) Explain the benchmark in the system analysis and design.

11. (a) Discuss the common problems of database design.

Or

(b) Explain various conversion methods of changing old system into new system.

(b) Discuss the following in respect of ATM networks

(i) Connection set up

(ii) Quality of services.

11. (a) Write an essay on the TCP connection management.

Or

(b) Discuss server side and client side concepts of www.

1725/R23

MAY 2008

COMPUTER NETWORKS

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

PART A— ($7 \times 5 = 35$ marks)

Answer ALL questions.

1. (a) Explain networks for companies.

Or

(b) Explain metropolitan area networks.

2. (a) Explain network layer.

Or

(b) Compare OSI and TCP/IP reference models.

3. (a) Explain the services provided by data link layer to network layer.

Or

(b) Explain data link simplex stop and wait protocol.

4. (a) Explain Global system for mobile communications.

Or

(b) Write note on the design aspects of a bridge.

5. (a) Explain the services provided by network layer to transport layer.

Or

(b) Explain flooding static algorithm.

6. (a) Explain the services provided to the upper layers by the transport layer.

Or

(b) Write a note on UDP.

7. (a) Write note on traditional cryptography.

Or

(b) Explain video on demand system with suitable diagram.

PART B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

8. (a) Discuss any three transmission media in detail.

Or

(b) Explain the following transmission media:

(i) Magnetic media.

(ii) Twisted pair and

(iii) Base band coaxial cable.

9. (a) Discuss error correcting and detecting codes in detail.

Or

(b) Discuss the token ring for IEEE standard 802.5 with suitable diagram.

10. (a) Write note on

(i) Hierarchical routing and

(ii) Routing for mobile hosts.

Or

3

11. (a) Explain how an element is inserted in to a min-max heap with suitable algorithm.

Or

(b) Explain and write an algorithm to delete a key Btree. Give an analysis of the algorithm.

1726/R24

MAY 2008

DATA STRUCTURE USING C++

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

Answer ALL the questions.

PART A — ($7 \times 5 = 35$ marks)

1. (a) Explain the verification phase of software product.

Or

(b) Explain data abstraction.

2. (a) Compare the algorithmic decomposition vs OO decomposition.

Or

(b) Explain the four scopes of C++.

3. (a) Explain how to design a list in C++.

Or

(b) Explain pointer manipulation in C++.

4. (a) Explain Virtual member functions.

Or

(b) Write a note on Dynamic binding in C++.

5. (a) Define the following with respect to a tree

(i) Degree of a node

(ii) Terminal node

(iii) Siblings

(iv) Degree of a tree and

(v) Depth of a tree.

Or

(b) Explain an one operation on Max heap.

6. (a) Explain any two types of uniform hash functions.

Or

(b) Explain chaining in hash tables.

7. (a) What are the conditions for a binary tree to be red-black tree?

Or

(b) What are the defining properties of m-way search tree?

PART B — (4 × 10 = 40 marks)

8. (a) Explain recursive Binary search and selection sort with suitable algorithms.

Or

(b) Discuss performance analysis and measurement of programs.

9. (a) Write note on

(i) Non-virtual member functions

(ii) Virtual member functions

(iii) Pure virtual member functions.

Or

(b) Discuss Creation of a Linked list and explain how to inset a node in it.

10. (a) Discuss various types of representations of binary trees with suitable diagrams.

Or

(b) Explain with suitable function

(i) To search an element in a binary search tree and

(ii) Insertion into a binary search tree.

(b) Find the approximate values of the integral.

$$\int_0^1 \frac{1}{1+x+x^2} dx$$

Using

(i) Trapezoidal rule and

(ii) Simpson's Rule with $h = 0.25$

11. (a) Apply Runge-Kutta Fourth order formula to obtain approximate solution of

$$dy/dx = x + y, y(0) = 1, h = 0.1$$

by obtaining $y(0.1)$ and $y(0.2)$ and $y(0.3)$.

Or

(b) Given $dy/dx = x^2 + y$, $y(0) = 1$, obtain $y(0.2)$, $y(0.4)$ and $y(0.6)$ using Taylor's method and obtain $y(0.8)$ using predictor method.

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

Answer ALL questions.

PART A — ($7 \times 5 = 35$ marks)

1. (a) Draw a flow chart to find real roots of a quadratic equation.

Or

(b) Explain Newton – Raphson method of finding roots of transcendental equation.

2. (a) Explain Birge-Vieta method.

Or

(b) Write note on Graffe's root squaring method.

3. (a) Compare Gauss – Seidal and Jacobi Iterative methods.

Or

(b) Explain the power method to find the eigen value of a matrix.

4. (a) Explain Gauss-Jordan elimination method.
 Or
 (b) Explain Gauss – Seidal iteration Method.
5. (a) What is an interpolating function? What are the interpolating conditions?
 Or
 (b) Explain Gregory – Newton Forward interpolation.
6. (a) Explain a method of numerical differentiation based on undetermined coefficients.
 Or
 (b) Explain simpson's rule of numerical integration.
7. (a) Explain Euler's Method.
 Or
 (b) Explain Runge-Kutta 4th order method.

PART B — (4 × 10 = 40 marks)

8. (a) Perform five iterations for the Muller method to find the root of the equation $Cox\ x - xe^x = 0$ correct to four decimals.
 Or
 (b) Find all the roots of the polynomial equation $x^3 - x^2 - x - 2 = 0$ using Graeffe's method correct to three decimals.

9. (a) Obtain the solution of the system of equations.

$$\begin{aligned} 10x_1 - x_2 - x_3 - x_4 &= 7 \\ -x_1 + 10x_2 - 2x_3 - x_4 &= 6 \\ -2x_1 - x_2 + 10x_3 - 3x_4 &= 4 \\ -3x_1 - x_2 - x_3 + 10x_4 &= 5 \end{aligned}$$

Using Gauss – Seidal iteration method.

- Or
 (b) Determine the largest eigen value and the corresponding eigen vector of the matrix.

$$\begin{vmatrix} 4 & 1 & 0 \\ 1 & 20 & 1 \\ 1 & 0 & 4 \end{vmatrix}$$

to 3 decimal places using power method.

10. (a) Interpolate by means of Newton forward and backward formulas, the sales of a concern for the years 1945 and 1966 from the following :

Year :	1931	1941	1951	1961	1971	1981
Sales (in lacs)	12	15	20	27	39	52

Or

11. (a) Explain the CGI programming with java Script and PERL.

Or

(b) Explain various operators available in VB Script with examples.

1728/R26

MAY 2008

JAVA PROGRAMMING

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

Answer ALL questions.

PART A — (7 × 5 = 35 marks)

1. (a) List the seven layers of OSI model and their functions.

Or

(b) Explain the four service primitives that can occur at various instance in the dialogue between two uses in the internet.

2. (a) Explain Sockets and Socket API.

Or

(b) Explain text formatting commands with illustration.

3. (a) Write various characteristics of java Programming.

Or

(b) Explain with a simple Java Program the declaration, initialization and display of variables.

4. (a) List any ten common Java Exceptions.

Or

(b) Explain Runnable interface.

5. (a) Define a Thread in Java. List the advantages of using thread over processes.

Or

(b) What are the attributes of <APPLET> tag? Explain each attributes with example.

6. (a) Explain various data types in Java Scripts with suitable example

Or

(b) Write the syntax of a function in Java Script with a suitable example.

7. (a) Explain any two data type in PERL with example.

Or

(b) Write a note on MsgBox function in VB Script with example.

PART B — (4 × 10 = 40 marks)

8. (a) Discuss :

(i) The four conceptual layers of TCP/IP software and

(ii) IP address

Or

(b) Write note :

(i) Internet explorer

(ii) Netscape Navigator.

9. (a) Explain various control statements available in Java with a suitable Program.

Or

(b) Explain any five Java Exception in Java with suitable examples.

10. (a) Write an essay datagram and its classes with example.

Or

(b) Write note on :

(i) creating and

(ii) loading and displaying image object in

Java.

/ OPERATING SYSTEMS

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

Answer ALL questions.

PART A — ($7 \times 5 = 35$ marks)

1. (a) Write a brief note on Early operating systems.

Or

- (b) Explain the process control Block.

2. (a) Explain the direct communication of processes.

Or

- (b) Explaining buffering in process communication.

3. (a) Explain preemptive scheduling.

Or

(b) What are the necessary conditions for dead lock situation?

4. (a) Explain resource allocation graph.

Or

(b) Write note on dead lock avoidance.

5. (a) Explain memory protection in relation to memory allocation.

Or

(b) Explain any one method of memory allocation.

6. (a) Explain optimal page replacement.

Or

(b) Explain any three basic operations on a file.

7. (a) Explain direct file access method.

Or

(b) Explain modern Unix systems.

PART B — ($4 \times 10 = 40$ marks)

8. (a) Write an essay on the operations on Processes.

Or

(b) Explain the usage and implementation of semaphores.

9. (a) Discuss the FCFS scheduling algorithm with a suitable example.

Or

(b) Discuss the components of Unix operating system.

10. (a) Discuss the hardware support necessary for the page tables.

Or

(b) Explain

(i) Hashed paged tables and

(ii) Inverted page tables.

11. (a) Explain Unix SVR4 I/O Management.

Or

(b) Explain Unix file system and its functions.

~~ARTIFICIAL NEURAL NETWORKS~~

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions.

1. (a) Compare human brain and E-brain.

Or

- (b) Explain the application of neural networks in the field of Forecasting.

2. (a) Explain performance of neural networks based on computational resources.

Or

- (b) Explain linearly in separable classes of networks with example.

3. (a) Explain any one supervised learning technique.

Or

- (b) Explain prediction networks.

4. (a) Explain multilevel discrimination.

Or

(b) Explain multilayer network.

5. (a) Explain briefly multilayer network.

Or

(b) Discuss the architecture of full counter propagation neural network.

6. (a) Explain polynomial networks.

Or

(b) Explain hetero association tasks.

7. (a) Explain three broad classes of evolutionary algorithms.

Or

(b) Explain termination criterion for optimization models.

PART B — ($4 \times 10 = 40$ marks)

Answer ALL questions.

8. (a) Explain any two classes of network architectures.

Or

(b) List out the applications of Neural networks.

9. (a) Explain the forward pass steps of training the back propagation network.

Or

(b) Discuss about the topologically organized networks.

10. (a) Explain distance Based learning.

Or

(b) Explain Boltzmann Machines as a generalization Hopfield Networks.

11. (a) Discuss iterated gradient descent optimization method.

Or

(b) Explain Schema theorem in detail.

~~CLIENT~~ – SERVER COMPUTING

(For those who joined in July 2006)

Time : Three hours

Maximum : 75 marks

Answer ALL questions.

PART A — (7 × 5 = 35 marks)

1. (a) Give various definitions of client server computing.

Or

- (b) Explain an two advantages of client/server computing.

2. (a) Explain classes and inheritance.

Or

- (b) Explain GUIs with suitable example.

3. (a) Explain Remote procedure calls.

Or

- (b) Explain the remote services provided by NOS.

4. (a) Explain object Linking and embedding.

Or

(b) Explain various features of relational databases.

5. (a) Explain network file services.

Or

(b) Explain system application architecture.

6. (a) Explain physical and data link layer of OSI Model.

Or

(b) Explain inter-process communication.

7. (a) Explain remote system management

Or

(b) Explain WAN issues in LAN administration.

PART B — (4 × 10 = 40 marks)

8. (a) Trace the chronological development of client/server computing.

Or

(b) Write an essay on the main frame-centric client/server computing.

9. (a) Explain any three services provided by network operating system.

Or

(b) Discuss the role of the client in detail.

10. (a) Explain the role of the server in detail.

Or

(b) Explain any two network operating systems in detail.

11. (a) Explain client server system development software.

Or

(b) Write note on

(i) Training and Technical staff and

(ii) Systems administrator training.