10. (a) Show that every chain is a distributive lattice.

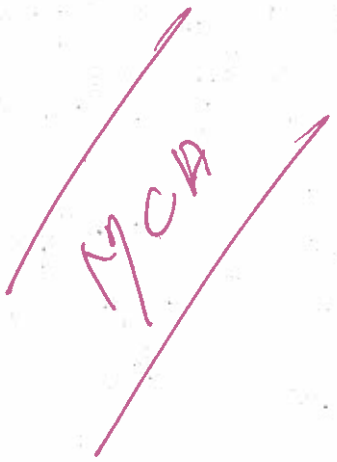
Or

(b) State and prove pumping lemma for regular sets.

11. (a) Prove that CFL are closed under concatenation.

Or

(b) Discuss about Turing Machine.



2084/R10/PMCA01 NOVEMBER 2016

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

SECTION A — ($7 \times 5 = 35$ marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Construct the truth table

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

Or

(b) Show that $P \to (Q \to R) \Leftrightarrow P \to (\neg Q \vee R) \Leftrightarrow (P \wedge Q) \to R$.

2. (a) Obtain the principal disjunctive normal form of $\neg P \vee Q$.

Or

(b) Demonstrate that R is a valid inference from the premises $P \to Q, Q \to R$ and P.

3. (a) Define the following with examples.

(i) Semigroup

(ii) Monoid.

Or

(b) Show that for any commutative monoid $< m, * >$, the set of idempotent elements of m forms a submonoid.

4. (a) Explain the partition and covering of a set.

Or

(b) State and prove the Lagrange's theorem.

5. (a) Show that $n^3 + 2n$ is divisible by 3.

Or

(b) Prove the following boolean identity.

$(a * b) \oplus (a * b') = a$.

6. (a) Differentiate between NDFA and DFA.

Or

(b) Give DFA accepting the following language over the alphabet $\{0, 1\}$. The set of all strings with three consecutive 0's.

7. (a) Define : pushdown automata. Give an example.

Or

(b) Write a context – free grammar for the language $L(G) = \{a^n b^m / n, m \geq 1\}$.

SECTION B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What are logical connectives? Explain with examples.

Or

(b) Prove that $(\exists x)(P(x) \wedge Q(x)) \Rightarrow (\exists x) P(x) \wedge (\exists x) Q(x)$

9. (a) What are the properties of a relation? Give examples.

Or

(b) Let A be the set of factors of a particular positive integer m and let $\leq$ be the relation divides, i.e.

$\leq = \{< x, y > | x \in A \wedge y \in A \wedge (x \text{ divides } y)\}$

Draw the Hasse diagram for

(i) $m = 6$

(ii) $m = 30$

(iii) $m = 210$.

(6 pages)

2085/R11/PMCA02 **NOVEMBER 2016**

ACCOUNTING AND FINANCIAL MANAGEMENT

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) What are the objectives of accounting? Explain.

Or

(b) Explain the various conventions of accounting.

2. (a) Differentiate between cash discount and trade discount.

Or

(b) State the need for preparing suspension account.

3. (a) Differentiate between trading and profit and loss account and balance sheet.

Or

(b) From the following balances, ascertained from the books of M/s. Laxmi and Bros. Prepare Profit and Loss account.

	Rs.	Rs.
Gross Profit		75,000
Carriage outwards	2,000	
Interest received		4,000
Salaries	5,000	
Depreciation	7,000	
Audit fees	3,000	
Discount (Dr.)	6,000	
Discount (Cr.)		8,000
Insurance	2,000	
General expenses	10,000	
Advertisement	12,000	

4. (a) Explain the uses of accounting ratios.

Or

(b) What are the advantages of budgetary control?

5. (a) What are the advantages of cash flow analysis?

Or

(b) Distinguish between fund from operation and cash from operation.

6. (a) Explain the general principles of cost accounting.

Or

(b) What are the functions of management accounting?

7. (a) Write a short note on profit-volume graph.

Or

(b) What are the advantages of standard costing system?

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What do you mean by error? Explain the various kinds of errors.

Or

(b) The following is the Trial Balance of Mr. Gyan on 30th June, 2007 :

Dr. Balances	Rs.	Rs.
Cash in Hand	540	
Cash at bank	2,630	
Purchases Account	40,675	
Sales Account		98,780
Returns Inward Account	680	
Returns Outward Account		500
Wages Account	10,480	

Dr. Balances	Rs.	Rs.
Fuel and Power Account	4,730	
Carriage on Sales Account	3,200	
Carriage on Purchase Account	2,040	
Stock Account (1st July, 2007)	5,760	
Building Account	30,000	
Freehold Land Account	10,000	
Machinery Account	20,000	
Patent Account	7,500	
Salaries Account	15,000	
General Exps. Account	3,000	
Insurance Account	600	
Drawings Account	5,245	
Capital Account		71,000
Sundry Debtors Account	14,500	
Sundry Creditors Account		6,300
	1,76,580	1,76,580

Taking into account the following adjustments, Prepare Trading Account and Profit and Loss Account and the Balance Sheet :

(i) Stock on hand on 30th June, 2007 is Rs. 6,800.

(ii) Machinery is to be depreciated at the rate of 10% and patents at the rate of 20%.

(iii) Salaries for the month of June 2007 amounting to Rs. 1,500 were unpaid.

(iv) Insurance includes a premium of Rs.170 on a policy expiring on 31st December 2007.

(v) Wages include a sum of Rs. 2,000 spent on the erection of a cycle shed for employees and customers.

(vi) A provision for Bad and Doubtful Debts is to be created to the extent of 5 per cent on Sundry Debtors.

9. (a) Calculate the cover for the preference dividend and equity dividend from the following information.

9% of 20,000 preference shares of Rs. 10 each

60,000 equity shares of Rs. 10 each

Profit after tax at 50% Rs. 1,80,000

Equity dividend paid at 20%.

Or

(b) Explain the different types of budgets.

10. (a) From the following data you are required to calculate the cash from operations :

Funds from operations for the year 1998 Rs. 84,000. Current assets and liabilities as on 1.1.98 and 31.12.98 were as follows :

	1.1.98	31.12.98
	Rs.	Rs.
Trade creditors	1,82,000	1,94,000
Trade debtors	2,75,000	3,15,000
Bills receivable	40,000	35,000
Bills payable	27,000	31,000
Inventories	1,85,000	1,70,000
Trade investments	40,000	70,000
Outstanding expenses	20,000	25,000
Prepaid expenses	5,000	8,000

Or

(b) Discuss the classification of cost.

11. (a) Explain the methods of classification of overheads.

Or

(b) Discuss about the variance analysis.

2086/R12/PMCA03 NOVEMBER 2016

PROGRAMMING IN C

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Illustrate the use of ternary operator.

Or

(b) What are the kinds of constants supported by C? Give examples.

2. (a) Explain in detail about scanf and printf statements in C.

Or

(b) Write a C program to find the factorial value of any number entered through the keyword.

3. (a) What do you mean by recursion? Explain.

Or

(b) Write a C program to find out square and cube of any given number using macros.

4. (a) What are the elements of function definition? Explain.

Or

(b) What is an auto variable? How is it declared and initialized?

5. (a) What are the advantages of using union?

Or

(b) How are the one-dimensional array elements read and written?

6. (a) What are pointers? What are the uses of pointer in C?

Or

(b) Explain about the bit fields with examples.

7. (a) What are the different modes of files? Describe.

Or

(b) Discuss about the command line parameters.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What are the fundamental data types supported by C? How are they declared? Give examples.

Or

(b) Explain the importance and structure of C.

9. (a) What is preprocessor directive? Discuss the various syntaxes of preprocessor directives and their applications.

Or

(b) What is meant by C library functions? Explain their uses.

10. (a) Write a C program to sort a set of names stored in an array in alphabetical order.

Or

(b) Explain with an example how a structure can be organized in the C language.

11. (a) Explain about the random access files.

Or

(b) Write a C program that copies one file to another, replacing all lower characters by their upper case equivalents.

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2087/R13/PMCA04 **NOVEMBER 2016**

DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) What are universal gates? Explain.

Or

(b) What is the octal equivalent of decimal 324.987?

2. (a) Show this subtraction in binary form: 47-23.

Or

(b) Write the procedure to perform binary multiplication.

3. (a) Explain about the JK Flip-Flop.

Or

(b) Write a short note on Counters.

4. (a) Write the procedure for addition in the l's and 2's complement system.

Or

(b) What is T flip-flop? Explain.

5. (a) Explain the basic organization of a micro programmed control unit.

Or

(b) What are the components of instruction format? Describe.

6. (a) What is a stack? Explain the uses of stack.

Or

(b) Describe the uses of I/O bus.

7. (a) Distinguish between memory mapped I/O and I/O mapped I/O operations.

Or

(b) Write a short note on Semiconductor ROM memories.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What is Karnaugh Map? Explain the two, three and four variable representation of Karnaugh map.

Or

(b) Write any five laws of Boolean algebra and Construct the truth table.

9. (a) Describe the different types of shift registers.

Or

(b) Explain in detail about half adder and full adder.

10. (a) Describe the different phases of instruction cycle.

Or

(b) Discuss the different addressing modes of an instruction.

11. (a) Explain in detail the different mappings used for cache memory. Compare them.

Or

(b) Write a brief note on Virtual memories.

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2088/R14/PMCA05 **NOVEMBER 2016**

COMMUNICATION SKILLS

(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, choosing either (a) or (b).

1. (a) Explain the importance of voice in communication.

Or

(b) Explain the significance of body language in communication.

2. (a) What are the techniques to attract the attention of a listener?

Or

(b) Explain the features of non-structured interview.

3. (a) What are the merits of group discussion?

Or

(b) Explain the term 'Role-playing'.

4. (a) What are the points to be kept in mind in seminar presentation?

Or

(b) Write a note on 'silent reading'.

5. (a) Suggest some methods to improve listening ability.

Or

(b) Explain the term 'metaphor' with examples.

6. (a) Explain the term 'Euphemism' with examples.

Or

(b) Explain the term 'Sarcasm' with examples.

7. (a) Give one word substitution for the following :

(i) Something that cannot be changed

(ii) Fit or suitable for eating

(iii) Not allowed by law

(iv) A person who knows several languages

(v) A person walking in a street.

Or

(b) Use the following idioms and phrases in sentences :

(i) Behind the scenes

(ii) Hit the nail

(iii) Take stock of

(iv) Give ear to

(v) Rise to the occasion.

PART B — (4 × 10 = 40 marks)

Answer ALL the questions, choosing either (a) or (b).

8. (a) Explain the points to be kept in mind while organising seminars.

Or

(b) Explain the various forms of public speaking.

9. (a) Explain the points to be kept in mind while attending an interview.

Or

(b) Explain the principles to be followed while writing.

10. (a) Discuss the uses of punctuation marks.

Or

(b) Explain the principles of paragraph structure.

11. (a) Explain the steps in report writing.

Or

(b) Suggest some ways to improve conversation skills.

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10. (a) Prove that the complete bipartite graph $K_{3,3}$ is non planar.

Or

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

11. (a) Explain any two applications of graphs in computer science.

Or

(b) What are the types of digraphs? Explain with examples.

2089/R15/PMCA06 NOVEMBER 2016

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, choosing either (a) or (b).

1. (a) Prove that $n_{c_r} = \frac{n!}{(n-r)!\,r!}$.

Or

(b) Out of 5 masters and 4 boys, a committee of 6 is to be choosen. In how many ways can be done (i) when there are 3 masters in the committee (ii) when there is to be a majority of masters.

2. (a) Prove that the sum of the degrees of the vertices of the graph is twice the numbers of its edges.

Or

(b) Describe the Konigsberg Bridge problem.

3. (a) Show that the tree on vertices contains exactly $(n-1)$ edges.

Or

(b) What is a binary tree? Explain.

4. (a) Prove that the ring sum of two cutsets in a connected graph is either a cutset or a union of a number of cutsets.

Or

(b) What do you mean by separable graph? Give an example.

5. (a) Define : Adjacency matrix of a graph G. Give an example.

Or

(b) How will you detect planarity? Explain.

6. (a) Prove that every tournament contains a Hamiltonian path.

Or

(b) What is an arborescence? Give an example.

7. (a) Explain any one method of counting of labelled tree.

Or

(b) Prove that the number of simple labeled graphs on n vertices is $2^{\binom{n}{2}}$.

PART B — $(4 \times 10 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Solve the recurrence relation $a_n + a_{n-1} - 2a_{n-2} = 0$ given that $a_0 = 1$ and $a_1 = 3$.

Or

(b) Write the shortest path algorithm and explain it.

9. (a) Write the Kruskal's algorithm to find the minimum spanning tree and explain it.

Or

(b) Prove that for any connected graph G on n vertices and e edges, $K(G) \leq \left[\frac{2e}{n}\right]$, the integral part of $\frac{2e}{n}$.

11. (a) What is quality assurance? Explain the process of software quality assurance.

Or

(b) Explain the managerial aspects of software maintenance.

2090/R16/PMCA07 NOVEMBER 2016

SOFTWARE ENGINEERING

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Define : Software. What are the various software areas indicate the breadth of potential applications?

Or

(b) What is software engineering? What are the primary goals of Software Engineering? Explain.

2. (a) What are the various project size categories? Explain.

Or

(b) What are the factors to be considered during setting project goals? Describe.

3. (a) What is Management By Objective? Explain.

Or

(b) Compare the democratic teams and chief programmer team structures.

4. (a) Explain about the Delphi cost estimation technique.

Or

(b) What are the COCOMO effort multipliers? Explain.

5. (a) What are the problems in SRS? Explain.

Or

(b) What is Data Flow Diagram? Explain with example.

6. (a) Define the term "Module". Write down the desirable properties of a modular system.

Or

(b) Explain the strategy of integrated top-down development.

7. (a) Write a short note on verification and validation of software.

Or

(b) Explain any two software maintenance tools.

PART B — (4 × 10 = 40 marks)

Answer ALL questions., choosing either (a) or (b).

8. (a) List out the factors that influence software quality and programmer productivity and explain any four of them.

Or

(b) Discuss the phased model of software life cycle.

9. (a) What are the major factors that influence the cost of the software? Explain.

Or

(b) Explain the expert judgment and work brake down structures software cost estimation techniques.

10. (a) Explain briefly any four fundamental concepts of software design.

Or

(b) Describe the rating scale of coupling.

2091/R17/PMCA08 **NOVEMBER 2016**

RELATIONAL DATABASE MANAGEMENT SYSTEM

(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, choosing either (a) or (b).

1. (a) Explain the characteristics of database approach.

Or

(b) What is DDL? Explain.

2. (a) Draw a E-R Diagram for Hospital database.

Or

(b) What are the database languages? Explain.

3. (a) Compare B tree and B+ tree.

Or

(b) What are the types of ordered indexes? Explain.

4. (a) What is view in SQL? Explain.

Or

(b) Illustrate the GROUP BY clause in SQL.

5. (a) Explain the structure of relational databases.

Or

(b) Write the syntax of CREATE TABLE command and explain it.

6. (a) Explain the use of embedded SQL in DB2.

Or

(b) Write a note on tuple-relational calculus.

7. (a) Define : Multivalued Dependency. Give an example.

Or

(b) Write an algorithm for testing the lossless join property.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What is a database system? Explain the various components of database system.

Or

(b) Describe the three schema architecture of DBMS.

9. (a) Explain the various hashing techniques.

Or

(b) Explain the functions of magnetic disk and magnetic tape.

10. (a) What are the five built-in aggregative functions of SQL? Explain with examples.

Or

(b) What is relational algebra? Explain the select, project and Cartesian product operations.

11. (a) Explain the various subsystems of DB2.

Or

(b) Discuss in detail about the first, second and third normal forms.

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2092/R18/PMCA09 **NOVEMBER 2016**

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 questions, choosing either (a) or (b).

1. (a) What is the fundamental idea behind object-oriented language? Write any eight applications areas of object-oriented programming.

Or

(b) What are the merits of Object-Oriented Programming?

2. (a) Difference between call by value and call by reference.

Or

(b) Write a short note on copy constructor.

3. (a) Write a C++ program to allocate an array of objects.

Or

(b) What is an operator function? Describe the syntax of an operator function.

4. (a) Write the general form of a class declaration and how to create objects for a class.

Or

(b) Write down the rules for Virtual functions.

5. (a) What is dynamic casting? How is it achieved in C++?

Or

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

6. (a) How is an exception handled in C++?

Or

(b) What does this pointer to? What are the applications of this pointer?

7. (a) What do you mean by finite state machine? Explain.

Or

(b) Write a C++ program to count the number of lines in a file.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Discuss OOP as a software design methodology.

Or

(b) What are the types of operators in C++? Explain with examples.

9. (a) Describe the various control structures in C++ with suitable examples.

Or

(b) Describe the methods of accessing data members and member functions of a class in the following cases:
(i) Inside the main program
(ii) Inside a member function of the same class
(iii) Inside a member function of another class.

10. (a) What are the operators can not be overloaded in C++? Explain the use of these operators.

Or

(b) Explain the multiple inheritance and hierarchical inheritance.

11. (a) What is a stream? Describe briefly the features of I/O system supported by C++.

Or

(b) Write a C++ program to merge two files.

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2093/R19/PMCA10 NOVEMBER 2016

MICROPROCESSORS AND EMBEDDED 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, choosing either (a) or (b).

1. (a) Draw the block diagram of digital computer and explain it.

Or

(b) What are the general registers in 8086/8088 microprocessor? Explain.

2. (a) Write a short note assembler directive.

Or

(b) Describe the fetch and execute operations of MPU.

3. (a) What are the control registers of 8255A? Describe.

Or

(b) What is a subroutine? Explain the CALL and RET statement.

4. (a) Write down the signal functions of the 8288 bus controller.

Or

(b) Explain the functions of 8259A programmable interrupt controller.

5. (a) Differentiate between floppy disk drives and winchester disk drives.

Or

(b) Explain the IBM PC DMA circuit.

6. (a) Describe the life cycle of an embedded system.

Or

(b) Write down the characteristics of an embedded system.

7. (a) What are the types of built-in self test? Explain.

Or

(b) Write down the various steps involved in digital switching system design.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What are the various addressing modes of 8086/8088? Explain with examples.

Or

(b) Explain about the data transfer and arithmetic instructions in 8086/8088.

9. (a) Write an Assembly language program for doing addition and subtraction of 8-bit numbers using shift operations.

Or

(b) Draw the block diagram of DMA Interface and explain it.

10. (a) Explain the interrupt section of IBM PC.

Or

(b) Write down the features of FilterLab.

11. (a) Explain the issues in embedded real time application design.

Or

(b) Explain about the embedded system applications.

———————

(b) Solve the following assignment problems

		Man			
		1	2	3	4
Work	I	12	30	21	15
	II	18	33	9	31
	III	44	25	24	21
	IV	23	30	28	14

10. (a) Explain the classification of stochastic processes.

Or

(b) Discuss about the birth and death process.

11. (a) A car park contains 5 cars. The arrival of cars is Poisson at a mean rate of 10 per hour.

The length of time each car spends in the car park has negative exponential distribution with mean of 2 hours. How many cars are in the car park on average and what is the probability that a newly arriving customer finding the car park full and having to park his car elsewhere?

Or

(b) Explain the embedded Mark chain approach to analyze M/G/1 model.

2094/R20/PMCA11 NOVEMBER 2016

OPTIMIZATION TECHNIQUES

(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, choosing either (a) or (b).

1. (a) Write the procedure for mathematical formulation of a LPP.

Or

(b) What are the assumptions of LPP? Describe.

2. (a) Describe the Two-phase simplex method.

Or

(b) Write the dual of the following LPP.

Minimize $Z = 2x_2 + 5x_3$

Subject to constraints

$$x_1 + x_2 \geq 2$$
$$2x_1 + x_2 + 6x_3 \leq 6$$
$$x_1 - x_2 + 3x_3 = 4$$

and $x_1, x_2, x_3 \geq 0$.

3. (a) Write the mathematical formulation of transportation problem.

Or

(b) Explain the Least Cost method to find the initial solution of transportation problem.

4. (a) Write the Hungarian method procedure to solve the assignment problem.

Or

(b) What is integer programming problem? Give an example.

5. (a) Define stochastic process. Give an example.

Or

(b) Derive the Kolmogorov's backward equation.

6. (a) Explain the Kendal's notation.

Or

(b) Describe the (M/M/C: GD/infinity/infinity) queuing model.

7. (a) Write a short note on M/G/1 queuing model.

Or

(b) Write down the properties of Z-transform.

PART B — (4 ×10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) A company manufactures two products A and B. Each unit of B takes twice as long as to produce one unit of A and if the company is to produce only A, it would have time to produce 2000 units per day. The availability of raw material is sufficient to produce 1500 units per day of both A and B combined. Product B requiring a special ingredient, only 600 units can be prepared per day. If A fetches a profit of Rs.2 per unit and B, a profit of Rs.4 per unit, Formulate the above as an LPP to maximize profit.

Or

(b) Solve the following the LPP using simplex method.

Max $Z = 15x_1 + 6x_2 + 9x_3 + 2x_4$

Subject to $2x_1 + x_2 + 5x_3 + 6x_4 \leq 20$

$3x_1 + x_2 + 3x_3 + 25x_4 \leq 24$

$7x_1 + x_4 \leq 70$

and $x_1, x_2, x_3, x_4 \geq 0$.

9. (a) Obtain an initial feasible solution to the following Transportation Problem using the Vogel's Approximation method.

	D1	D2	D3	D4	Supply
O1	3	3	4	1	100
O2	4	2	4	2	125
O3	1	5	3	2	75
Demand	120	80	75	25	300

Or

2095/R21/PMCA12 NOVEMBER 2016

COMPUTER GRAPHICS

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Compare LCD and LED.

Or

(b) Write a short note Flat Panel Display.

2. (a) Define: Circle. Write down the properties of circle.

Or

(b) What is tablet? Explain the types of tablets.

3. (a) What do you understand by the term "Concatenation of transformations"? Explain.

Or

(b) What is scaling? What is the difference between uniform and differential scaling?

4. (a) Explain about the bundled attributes.

Or

(b) What do you mean by dragging? Explain.

5. (a) What are the three modes of input functions? Explain.

Or

(b) Write a note on gravity field.

6. (a) Describe the three dimensional display techniques.

Or

(b) Explain the translation in 3D transformation.

7. (a) Explain the 3D clipping algorithm.

Or

(b) Discuss about the scan line method.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What is Computer Graphics? Explain the applications of Computer Graphics.

Or

(b) Write the Bresenham's line algorithm and explain it.

9. (a) Explain about the shearing and reflection 2D Transformations.

Or

(b) What are the various attributes of line? Explain.

10. (a) Explain the segment file organization for a display file system.

Or

(b) Explain the logical classification of inputs devices.

11. (a) Compare parallel versus perspective projections.

Or

(b) Write a depth-buffer algorithm.

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2096/R22/PMCA13 NOVEMBER 2016

SYSTEM ANALYSIS AND DESIGN

(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, choosing either (a) or (b).

1. (a) Compare natural systems and man-made systems.

Or

(b) Explain the concepts of business system.

2. (a) Describe the scope of initial investigation.

Or

(b) What are the three types of cost and benefits? Explain.

3. (a) Compare fixed and variable costs and benefits.

Or

(b) Explain the planning process.

4. (a) "A data dictionary is a structured repository of data about data". Discuss.

Or

(b) Explain the entity relationship diagram and its functions.

5. (a) Explain the different kinds of information.

Or

(b) What is a data model? Explain the components of data model.

6. (a) What are physical design and its main tasks?

Or

(b) What are the objectives of output design?

7. (a) What is conversion? Explain.

Or

(b) What is Benchmarking? Explain.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Discuss the six phases in the system development life cycle.

Or

(b) What are the major categories of players in a typical systems development project? Explain.

9. (a) Explain any two techniques for the evaluation of cost benefit.

Or

(b) What are the steps involved in feasibility analysis? Explain.

10. (a) What is DFD? What are its components? Give an example.

Or

(b) Explain the overview of system analysis.

11. (a) What are the main components of computer-user interface design? Explain.

Or

(b) What are the training methods? Explain.

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2097/R23/PMCA14 NOVEMBER 2016

COMPUTER NETWORKS

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) What is a computer network? Describe the applications of computer network.

Or

(b) Compare Broadcast networks and Point-to-Point networks.

2. (a) Explain about the wireless network.

Or

(b) What are the four classes of service primitives? Explain.

3. (a) Explain the basic idea of an ALOHA system.

Or

(b) Write an algorithm for one-bit sliding window protocol.

4. (a) Write a short note on firewalls.

Or

(b) What are the advantages and disadvantages of transparent fragmentation? Explain.

5. (a) Describe the design issues of data link layer.

Or

(b) Explain the design issues of network layer.

6. (a) What are the components of multimedia? Explain.

Or

(b) Explain the features of IPv6.

7. (a) What is encryption? Explain its process.

Or

(b) What are the five basic functions of E-mail? Explain.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Explain the characteristics of any two Guided Physical media.

Or

(b) Explain about the ISDN System Architecture.

9. (a) Compare Datagram and Virtual Circuit Subnets.

Or

(b) Explain about the Communication satellites.

10. (a) What is Congestion Control? Describe the principles of congestion control.

Or

(b) Explain in detail about the ATM Networks.

11. (a) Explain any two fundamental cryptographic algorithm.

Or

(b) Explain the importance of World Wide Web.

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2098/R24/PMCA15 **NOVEMBER 2016**

DATA STRUCTURES USING C++

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Define the term "Algorithm". What are the characteristics of an algorithm?

Or

(b) What are the data types supported by C++? Give examples.

2. (a) Explain the four scope of C++.

Or

(b) Write an algorithm to insert an element into a Circular Queue.

3. (a) Write a procedure to creating a linked list.

Or

(b) How to representing lists in C++? Explain.

4. (a) Define: Generalized list. Give examples.

Or

(b) Define any five terminologies related to Tree.

5. (a) What are the properties of Binary Trees?

Or

(b) Discuss the object-oriented system of free data structures.

6. (a) What is a Dynamic Hashing? What is the objective of Dynamic Hashing?

Or

(b) Write a procedure to insert and delete an element in a deap.

7. (a) What are the properties of B-Tree?

Or

(b) Write a procedure to delete an element from b-tree and explain it.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Explain about the asymptotic notations.

Or

(b) What is a Queue? What are the operations performed on it? Explain with examples.

9. (a) Write a procedure to insert and delete an element in a linked stack.

Or

(b) What is a virtual function? What are the rules for Virtual function?

10. (a) Explain the different ways of representation of trees.

Or

(b) Explain the three traversals of binary tree.

11. (a) Define Binomial Heap. Write a procedure to insert element into Binomial Heaps.

Or

(b) Write a procedure to insert an element into a Red-Black Tree.

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10. (a) Apply central difference formula to find $f(12)$ given

x:	5	10	15	20
$f(x)$:	54.14	60.54	67.72	75.88

Or

(b) Using Lagrange's formula of interpolation find $y(9.5)$ given

x:	7	8	9	10
y:	3	1	1	9

11. (a) By dividing the range into ten equal parts, evaluate, $\int_0^{\pi} \sin x \, dx$ by Simpson 1/3 rule.

Or

(b) Apply the fourth order Runge-Kutta method to find $y(0.2)$ given that $y' = x + y$, $y(0) = 1$.

2099/R25/PMCA16 NOVEMBER 2016

COMPUTER BASED NUMERICAL METHODS

(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, choosing either (a) or (b).

1. (a) Draw a flowchart to find real roots of the equation $ax^2 + bx + c = 0$.

Or

(b) Write down the procedure steps for bisection method.

2. (a) Explain the Muller method.

Or

(b) Find a real root of the equation $\cos x = 3x - 1$ correct to three decimal places using iteration method.

3. (a) Find all the eigen values of the matrix $\begin{bmatrix} 2 & 3 & 1 \\ 3 & 2 & 2 \\ 1 & 2 & 1 \end{bmatrix}$.

Or

(b) Explain the Gauss Elimination method.

4. (a) Find the inverse of the matrix $A = \begin{bmatrix} 2 & 3 & -1 \\ 3 & 1 & 2 \\ -1 & 2 & -1 \end{bmatrix}$.

Or

(b) Describe the House holder's method for symmetric matrices.

5. (a) Explain the Newton's forward interpolation formula.

Or

(b) Find a polynomial of degree four which takes the values.

x:	2	4	6	8	10
y:	0	0	1	0	0

6. (a) Describe the stirling's formula.

Or

(b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal rule with $h = 0.2$.

7. (a) Using Taylor's series method, find $y(0.1)$ given $y' = x^2 - y$, $y(0) = 1$.

Or

(b) Explain the Runge-Kutta fourth order method.

PART B — ($4 \times 10 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Find the positive root of $x = \cos x$ using Newton's method.

Or

(b) Find all the roots of $x^3 - 4x^2 + 5x - 2 = 0$ by Graeffe's method.

9. (a) Solve the following system of equations by triangularization method.

$x + y + 5z = 16$

$2x + 3y + z = 4$

$4x + y - z = 4$

Or

(b) Solve by Gauss-Seidal method, the following system :

$28x + 4y - z = 32$

$x + 3y + 10z = 24$

$2x + 17y + 4z = 35$

11. (a) How to write event handlers in JavaScript? Discuss.

Or

(b) What are intrinsic functions in VB Script? Explain.

2100/R26/PMCA17 NOVEMBER 2016

JAVA PROGRAMMING

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) What is an Internet? Explain the histories of internet.

Or

(b) What is WWW? Explain.

2. (a) What are the attributes of <BODY>? Explain.

Or

(b) What are the attributes of <img> tag? Explain.

3. (a) Discuss the features of Java Language.

Or

(b) What are the different ways to generate an Exception? Explain.

4. (a) What is the use dot operator? Explain.

Or

(b) Write a java program, which will read a string and rewrite it in the alphabetical order.

5. (a) Write a short note on datagram in Java.

Or

(b) Describe the different stages in the life cycle of an applet.

6. (a) What is CGI? Explain the programming with Java script and perl.

Or

(b) Describe the properties of form object in java script.

7. (a) What are the two kinds of procedures? Explain.

Or

(b) What is OLE? Explain.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What are the seven layers of OSI reference model? Explain.

Or

(b) Write a short note on :

(i) FTP

(ii) Telnet.

9. (a) Discuss the three loop constructs in Java with examples.

Or

(b) Write a Java program that will count the number of characters in a file.

10. (a) Write an applet to draw National flag with color.

Or

(b) What are the attributes of APPLET tag? Explain.

2101/R27/PMCA18 NOVEMBER 2016

OPERATING 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, choosing either (a) or (b).

1. (a) Compare multiprogramming and time-sharing operating system.

Or

(b) What is semaphore? What is the use of it?

2. (a) Explain about the Mutual Exclusion.

Or

(b) How to detect a deadlock? Explain with an example.

3. (a) What is a dispatcher? Explain the functions of dispatcher.

Or

(b) Write down the objectives of process scheduling.

4. (a) What are the memory management strategies? Describe.

Or

(b) Discuss about the contiguous memory allocation.

5. (a) What is fragmentation? Explain.

Or

(b) Write a short note on overlays.

6. (a) What is a file? What are its attributes? Describe.

Or

(b) Compare sequential access and direct access file.

7. (a) Write down the history of UNIX operating system.

Or

(b) Explain the process creation in UNIX.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Discuss the structure of the operating system.

Or

(b) Draw the state diagram of a process from its creation to termination, including all transitions, and briefly elaborate every state and every transition.

9. (a) Explain any two CPU Scheduling algorithms.

Or

(b) Write a Banker's algorithm and explain it.

10. (a) What is virtual memory? Explain.

Or

(b) What is need for page replacement? Discuss.

11. (a) Describe any two Disk Scheduling Algorithms.

Or

(b) Describe the concurrency mechanisms of UNIX.

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2102/R28/PMCA19 **NOVEMBER 2016**

ARTIFICIAL NEURAL NETWORKS

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Compare Neural networks and Conventional Computers.

Or

(b) What is a polynomial networks? Explain.

2. (a) Explain the operational features of Perceptron Learning.

Or

(b) What are the two categories of training algorithms? Explain.

3. (a) What are the steps involved in training the back propagation? Describe.

Or

(b) Write a QuickProp Algorithm and explain it.

4. (a) What is multilayer network? Mention its use.

Or

(b) Describe the sigmoid function in neural network.

5. (a) Write a Short note on Neocognitron.

Or

(b) Describe the uses of clustering in Neural Networks.

6. (a) What is a hetero-associator? Explain.

Or

(b) What are the two kinds of association tasks? Explain.

7. (a) What is Hopfield network? Explain.

Or

(b) What is Stimulated annealing? Describe.

PART B – (4 × 10 = 40 marks)

Answer All Questions, Choosing either (a) or (b).

8. (a) Describe the various applications of Neural Networks.

Or

(b) Explain the structure and functions of a Single Neuron.

9. (a) Discuss the fundamental building block for back propagation networks.

Or

(b) Explain the Madaline II architecture.

10. (a) Describe Boltzmann Machine learning algorithm.

Or

(b) What is ART? Explain.

11. (a) Write a Non-iterative procedure for association.

Or

(b) Explain the iterated gradient descent optimization method.

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2103/R29/PMCA20 NOVEMBER 2016

CLIENT/SERVER COMPUTING

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) What is rightsixing and downsizing? Explain.

Or

(b) What are the advantages of client/server computing?

2. (a) What is RPC? Explain.

Or

(b) Discuss about the CORBA architecture.

3. (a) What is distributed computer system? Explain.

Or

(b) What is the role of server? Explain.

4. (a) Write a short on MVS.

Or

(b) What is SSA? Explain.

5. (a) Write down the services provided by NetBIOS.

Or

(b) Compare FDDI and CDDI.

6. (a) Explain architecture of TCP/IP.

Or

(b) Write a short note on Token Ring IEEE 802.5.

7. (a) Explain the performances of system administration.

Or

(b) What is GUI? Explain.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What are the fundamental ideas underlying Object Oriented Technology? Explain any four of them.

Or

(b) Explain about the client/server development tools.

9. (a) Describe the role of client and its services.

Or

(b) Explain the concepts of DDE and OLE.

10. (a) Write down the features of network operating system.

Or

(b) Explain about the Unix and windows operating systems.

11. (a) What is WAN? Explain.

Or

(b) Discuss about the LAN administrations.

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2104/R30/PMCA21 NOVEMBER 2016

WEB TECHNOLOGY

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) What is ISP? Explain.

Or

(b) Write down the functions of the web server.

2. (a) Explain the process of installing IIS.

Or

(b) Describe the CGI Server Requirements.

3. (a) Write down the use of <FORM> Tag.

Or

(b) Discuss in detail about URL Coding.

4. (a) Write a short note on CGI libraries.

Or

(b) Write down the features of Unix shell script.

5. (a) Explain the basic elements of CGI.

Or

(b) How will you configure TCP/IP?

6. (a) What is packet filtering? Explain.

Or

(b) Write down the steps to creating application using Perl.

7. (a) What is cryptanalysis? Explain.

Or

(b) Describe the types of attacks.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Discuss the IIS architecture and services.

Or

(b) Write a short note on domain name system.

9. (a) Explain how to designing CGI application.

Or

(b) Explain how Visual Basic is used for CGI application development.

10. (a) How to build a firewall?

Or

(b) Explain how to developing HTML form.

11. (a) Explain the overview of encryption technologies.

Or

(b) Compare symmetric and asymmetric key cryptography.

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2105/R31/PMCA22 NOVEMBER 2016

PRINCIPLES OF MANAGEMENT AND ORGANIZATIONAL BEHAVIOR

(For those who joined in July 2006 onwards)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Explain the role and functions of management.

Or

(b) Describe any five characteristics of management as profession.

2. (a) What is formal planning? Explain its advantages.

Or

(b) What are the advantages and disadvantages of objectives?

3. (a) Explain briefly about the essential of a sound strategy.

Or

(b) State briefly about the features of formal organization.

4. (a) Explain the factors influencing the significance of controlling.

Or

(b) Describe the main benefits of control.

5. (a) Define : Organizational Behavior. What are its features?

Or

(b) Describe the human behavior approach.

6. (a) What is organizational culture? What are the features of organizational culture?

Or

(b) What do you mean by group cohesiveness? Explain.

7. (a) What is autocratic style of leadership? Explain.

Or

(b) How to manage or cope with stress?

PART B – (4 × 10 = 40 marks)

Answer ALL Questions, Choosing either (a) or (b).

8. (a) Explain the principles of management as given by Henri Fayol.

Or

(b) What do you mean by policy? What are the principles of policy making? Discuss.

9. (a) Explain the importance of oral and written communication.

Or

(b) Describe the various techniques of control.

10. (a) "Organizational behavior is the study of individuals, groups, and organizations". Comment on the statement.

Or

(b) Define : Job satisfaction. Discuss its relationship with attitude and productivity.

11. (a) Discuss the process of communication.

Or

(b) What are the different factors affecting work design? Explain.

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2106/R32/PMCA23 NOVEMBER 2016

NETWORK PROGRAMMING

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Explain about the internet address formats.

Or

(b) What is UUCP? Explain.

2. (a) What are the three interfaces provided by SPP? Explain.

Or

(b) Explain the session service provided by NetBIOS.

3. (a) Discuss about the elementary socket system calls required to perform network programming.

Or

(b) Write down the features of Unix Domain Protocols.

4. (a) Write a short note on asynchronous I/O.

Or

(b) Explain the networking implementation in 4.3 BSD.

5. (a) Discuss briefly about basic Windows Sockets.

Or

(b) Write a short note on IPX addresses.

6. (a) Explain about SPX commands.

Or

(b) Compare the Novell NetWare with OSI model.

7. (a) What is Ping? Explain.

Or

(b) What is ICMP? Explain.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) Discuss the architecture of Xerox Network System.

Or

(b) Explain about the TCP/IP Protocol Suite.

9. (a) What are the ways to set options that affect a socket? Explain.

Or

(b) Write a short note on Berkeley sockets.

10. (a) Discuss about the IPX routing architecture.

Or

(b) Explain about the 4.3 BSD rlogin processes.

11. (a) What is TFTP? Explain.

Or

(b) Describe the datagram services of programming IPX.

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2107/R33/PMCA24 **NOVEMBER 2016**

VISUAL PROGRAMMING CONCEPTS IN VISUAL C++

(For those who joined in July 2006 and after)

Time : Three hours Maximum : 75 marks

PART A — (7 × 5 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) Compare DOS and Windows Operating system.

Or

(b) What are the three main modules generally handle Windows programming? Explain.

2. (a) What is bitmap? Explain.

Or

(b) What is Icons? Write down the steps to creating Icons.

3. (a) Describe the various Windows Button control classes.

Or

(b) What is a dialog box? What are the two types of dialog box? Describe.

4. (a) Explain the uses of push and radio button.

Or

(b) What is API? What are the two types of Windows API? Describe.

5. (a) Describe the mouse messages handler.

Or

(b) What is a message map? Explain.

6. (a) Compare SDI and MDI.

Or

(b) What are file I/O classes? Explain.

7. (a) How to display picture files?

Or

(b) Explain the key properties for the Radio Button Control.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

8. (a) What are the three types of menus in a windows application? Explain.

Or

(b) Explain the components of windows programming.

9. (a) Discuss in detail about the message handling in windows application.

Or

(b) Discuss the Windows Software Development Kit programming steps.

10. (a) Explain the C Object classes from MFC Class Library.

Or

(b) Write a program to create your own pen to draw a line and rectangle.

11. (a) Compare Document/view architecture with dialog-based architecture.

Or

(b) Write a short note on Application Wizard and Class Wizard.

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2108/R34/PMCA25 NOVEMBER 2016

DATA MINING AND DATA WAREHOUSING

(For those who joined in July 2006 onwards)

Time : Three hours Maximum : 75 marks

PART A — ($7 \times 5 = 35$ marks)

Answer ALL questions, choosing either (a) or (b).

1. (a) What is data mining? How is data mining different from KDD?

Or

(b) Define : Metadata. Write down the features of metadata.

2. (a) What is Snow Flake Scheme? What are the advantages of it?

Or

(b) Explain the functions of OLAP Engine.

3. (a) Describe the Naïve Algorithm.

Or

(b) Describe the Incremental algorithm.

4. (a) Explain about the border algorithm.

Or

(b) What are the three phases in the association rules with item constraints? Explain.

5. (a) Explain the working of the DBSCAN algorithm.

Or

(b) Write a short note on CLARA.

6. (a) Explain the working of Genetic Algorithm.

Or

(b) What is CART? Explain.

7. (a) What is information retrieval? Explain.

Or

(b) What is the goal of information extraction? Explain.

PART B — (4 × 10 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

8. (a) What are the stages of KDD? Explain.

Or

(b) Explain the functions of data warehouse backend process.

9. (a) Explain the Apriori Algorithm.

Or

(b) Discuss about the partition algorithm.

10. (a) Write a brief note on Hierarchical clustering.

Or

(b) Discuss about the Back-Propagation Algorithm.

11. (a) Discuss the architecture of Neural Networks.

Or

(b) Write a short note on Web mining and text mining.

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