

W-2135

Roll No. ....



**B. C. A. (Part II) EXAMINATION, 2013**

Paper Fifth

**PROGRAMMING IN C++ AND VISUAL C++**

*Time : Three Hours.]*

*[ Maximum Marks : 100*

*[ Minimum Pass Marks : 40*

**Note :** Attempt any *two* parts from each question. All questions carry equal marks.

1. (a) What are the advantages of Object Oriented Programming ?  
(b) What do you mean by Polymorphism ? Explain with example.  
(c) Explain overloading with example.
2. (a) What are the differences between structure and class ?  
(b) Write a program in C++ to demonstrate multiple inheritance.  
(c) What do you mean by Operator Overloading ? Explain with an example.
3. (a) Explain virtual functions with suitable example.  
(b) Write a program in C++ to check whether entered number is armstrong or not.

- (c) What are the different types of inheritance ?  
Explain in brief.
- 4. (a) What are the differences between Relational and  
Object oriented databases ?  
(b) Define Booch methodology in brief.  
(c) What are the concepts of Object Structure ?
- 5. (a) Write a short note on VC++.  
(b) Explain the features of MFC.  
(c) Explain the following :
  - (i) View object
  - (ii) Document object



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**B. C. A. (Part II) EXAMINATION, 2013**

Paper Sixth

**COMPUTER NETWORKING AND INTERNET  
TECHNOLOGY**

*Time : Three Hours ]*

*[ Maximum Marks : 100*

*[ Minimum Pass Marks : 40*

**Note :** Attempt any two parts from each Unit. All questions carry equal marks.

**Unit-I**

1. (a) What is Computer Network ? Explain different standard organizations of computer network.
- (b) Explain point to point and multipoint line configuration in brief.
- (c) What do you mean by Topology ? Explain various topologies with suitable diagram.

**Unit-II**

2. (a) What is TCP/IP Reference Model ? Explain functions of each layer of TCP/IP model.
- (b) What do you mean by Protocol ? Explain frame format of UDP datagram of transport layer.
- (c) Explain the term "Arpanet" and "NSFNET" in detail.

**Unit - III**

3. (a) What is the purpose of Encoding ? Explain various types of encoding method with suitable example.
- (b) What do you mean by Interface ? Briefly explain DTE-DCE interface with diagram.
- (c) What is Modem ? Explain the types of modem and standards of modem.

**Unit - IV**

4. (a) Explain CGI scripting with suitable example.
- (b) What is HTML ? How do we use table, form, image in HTML ? Give an example separately.
- (c) What is Internet, Intranet and Extranet ? Explain client server model of internet with diagram.

**Unit - V**

5. (a) Define Java script. Explain structure and basic commands of Java script with examples.
- (b) Define styles in HTML tags. What are the features of Style Sheet ?
- (c) What do you understand by dynamic HTML ? Create a simple web page through dynamic HTML.



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**B. C. A. (Part II) EXAMINATION, 2013**

**Paper Fourth**

**DBMS (ORACLE, SQL)**

*Time : Three Hours ]*

*[ Maximum Marks : 100*

*[ Minimum Pass Marks : 40*

**Note :** Attempt *two* parts from each question. All questions carry equal marks.

1. (a) What are the main functions of a database administrator ? Also explain different kinds of DBMS users.  
(b) What is database language ? Explain various database languages with appropriate examples.  
(c) Explain DBMS system structure with suitable block diagram.
2. (a) Explain the concept of aggregation. Give *two* examples of where this concept is useful.  
(b) Construct an E-R diagram for a banking enterprise which includes the entity sets, attribute, relationship set and mapping cardinalities.  
(c) How do we convert an E-R model to relational schema ? Explain in detail with appropriate examples.

3. (a) What is relational algebra ? Explain the fundamental unary and binary operations of relational algebra.
- (b) Consider the following relation :
- loan (loan-number, branch-name, amount)
- borrower (customer-name, loan-number)
- Give a relational algebra expression for each of the following query :
- Select those tuples of loan relation where branch is "Perryridge".
  - Find all tuples in which the amount lent is more than \$1200.
  - Find the names of all customers with a loan in the bank.
  - List all loan number and amount of the loan.
  - Find those tuples pertaining to loans of more than \$1200 made by the Perryridge branch.
- (c) What is integrity constraint ? Explain not null, unique and check integrity constraint.
4. (a) What are the pitfalls in relational database design ? Explain with suitable example.
- (b) Explain decomposition with appropriate example. Also explain lossy decomposition and lossless join decomposition.
- (c) How can we obtain Boyce Codd normal form ? Compare BCNF and 3 NF.
5. (a) Consider the following relational schema :
- depositor (customer-name, account-number)
- borrower (customer-name, loan number)
- account (account-number, branch-name, balance)
- customer (customer-name, customer-street, customer-city)

Write SQL Command for the following query :

- Find all customer having a loan, an account or both at the bank.
  - Find all customers who have an account, but no loan at the bank.
  - Find average account balance at the "Perryridge" branch.
  - Find number of tuples in the account relation.
  - Find names of all customer whose street address includes the substring "main."
- (b) Write down the syntax for create a table in SQL and explain it. Write SQL command to create a "Customer" table with the following attribute : (Customer-id, Customer-name, Customer-street, Customer-city). Define customer-id as primary key.
- (c) Explain SQL DDL commands to insert, delete, retrieve and update data in a table.

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**B. C. A. (Part II) EXAMINATION, 2013**

Paper Second

**DIFFERENTIATION AND INTEGRATION**

*Time : Three Hours ]*

*[ Maximum Marks : 50*

**Note :** Attempt any two parts from each question. All questions carry equal marks.

**Unit-I**

1. (a) If  $I_n = \frac{d^n}{dx^n} (x^n \log x)$ , prove that :

$$I_n = n I_{n-1} + (n-1)!$$

- (b) Verify Cauchy's mean value theorem for function  $x^2$  and  $x^3$  in  $[1, 2]$ .  
(c) Expand  $2x^3 + 7x^2 + x - 1$  in powers of  $(x-2)$  by Taylor's theorem.

**Unit-II**

2. (a) Find the asymptotes of the curve :

$$y^3 - xy^2 - x^2y + x^3 + x^2 - y^2 - 1 = 0.$$

- (b) For the ellipse :

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

prove that the radius of curvature at an end of the major axis is equal to the semi-latus rectum of ellipse.

- (c) Trace the curve :

$$y^2(2a-x) = x^3.$$

## Unit-III

3. (a) If
- $x^2 y^2 z^2 = c$
- , then show that :

$$\frac{\partial^2 z}{\partial x \partial y} = -(x \log_e x)^{-1}$$

when  $x = y = z$ .

- (b) State and prove Euler's theorem for Homogeneous Functions of two variables.

- (c) If
- $u^3 + v^3 = x + y$
- and
- $u^2 + v^2 = x^3 + y^3$
- , then show that :

$$J(u, v) = \frac{\partial(u, v)}{\partial(x, y)} = \frac{y^2 - x^2}{2uv(u - v)}.$$

## Unit-IV

4. (a) Evaluate :

$$\int \frac{dx}{(x^2 + 1) \sqrt{x^2 - 1}}$$

- (b) Find the value of :

$$\int_0^{\pi/2} \frac{dx}{4 + 5 \sin x}$$

- (c) Use properties of definite integral, find the value of :

$$\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$$

## Unit-V

5. (a) Evaluate :

$$\int_0^{\pi/2} \int_0^{\pi/2} \int_0^{\sin x} x^2 \sin y \, dz \, dy \, dx$$

- (b) Evaluate the following integral by changing the order of integration :

$$\int_0^a \int_y^a \frac{x \, dy \, dx}{x^2 + y^2}$$

- (c) Find the length of the arc of the curve :

$$y = \log \frac{e^x - 1}{e^x + 1} \text{ from } x = 1 \text{ to } x = 2.$$



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**B. C. A. (Part II) EXAMINATION, 2013**

**Paper Third**

**DATA STRUCTURE**

*Time : Three Hours ]*

*[ Maximum Marks : 50*

**Note :** Attempt *two* parts from each question. All parts carry equal marks.

**Unit—I**

1. (a) How do you find the complexity of an algorithm ? What is the relation between the time and space complexities of an algorithm ? Justify your answer with an example.
- (b) What is a data structure ? Mention the various types of data structures.
- (c) Define Algorithm. What are the features of an efficient algorithm ?

**Unit—II**

2. (a) Show the bubble sort steps for the following numbers :  
25 10 72 18 40 11 32 9
- (b) Write and explain an algorithm to search a list of numbers using linear search method.

- (c) What is array ? How are two-dimensional arrays stored in memory ?

### Unit—III

3. (a) What is a Stack ? Explain various operations performed using stack with examples.
- (b) Write algorithms to insert and delete elements from a queue.
- (c) What is a linked list ? Explain the different types of linked list with a neat diagram.

### UNIT—IV

4. (a) Explain Binary search tree in brief with one example and also explain the advantages of Binary search tree.
- (b) Write an algorithm for Insert and Delete a node from a Binary Search Tree.
- (c) Show the result of inserting the keys. F, S, Q, K, C, L, H, T, V, W, M, R, N, P, A, B, X, Y, D, Z, E in the order to an empty B-tree of degree-3.

### UNIT—V

5. (a) Write an algorithm to sort a list of elements using Merge sort technique.
- (b) Write an algorithm to sort a list of elements using Selection sort technique.
- (c) Discuss the procedure and develop an algorithm to sort a list of elements using Insertion Sort technique.

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**B. C. A. (Part II) EXAMINATION, 2013**

Paper Ninth

(Foundation Course)

ENGLISH LANGUAGE

*Time : Three Hours ]*

*[ Maximum Marks : 50*

*[ Minimum Pass Marks : 20*

**Note :** Attempt all questions.

**Unit—I**

1. Answer any five of the following questions : 10

- (a) What do you mean by phrase "All men are scientists" ?
- (b) Who is the earliest person who wrote on medicine in ancient India ?
- (c) When did the pulse of the plant become more violent and more rapid ?
- (d) Which situation is worse than illiteracy ?
- (e) In how many ways does pollution enter the waterways ?
- (f) Which epic-making discoveries were made in the field of Mathematics in ancient India ?

## Unit-II

2. (a) Read the following passage and answer the questions given below : 5

It is probably very silent on the Moon because there are no clouds on the Moon, for there is no water. Clouds are made of water. Thus there are no plants, no trees, no grass on the Moon. Actually there is nothing living there, or if there are living things, they are not at all like the living things on Earth. Your limbs would feel like feathers. You would be able to run many times faster than you can on Earth. There are no human beings on the Moon. No human being would live there, for there is no water and no air. On Earth, most of the sound we hear are transmitted through the air. You would feel very light on the Moon because the pull of gravity there is much less than that on Earth. You would be able to run as fast as a train. You would be able to jump as high as a house.

Questions :

- (i) Why are there no clouds on the moon ?
- (ii) Why do feel light on the moon ?
- (iii) Describe your feelings when you are on the moon.
- (iv) What are clouds made of ?
- (v) How fast would you be able to run on the moon ?

- (b) Give synonyms of the words given below (any five) : 5

- (i) disease
- (ii) certain
- (iii) harm
- (iv) attack
- (v) perfect
- (vi) conquer
- (vii) cure

- (c) Give antonyms of the words given below (any five) : 5

- (i) small
- (ii) sleep
- (iii) concave
- (iv) soar
- (v) rapid
- (vi) necessary
- (vii) defend

## Unit-III

3. Write a report on Air Pollution in your city. 5

Or

Write a report on Annual Function of your college.

## Unit-IV

4. Write about any one of the following : 5

- (a) All that glitters is not gold.
- (b) Time and tide wait for none.
- (c) Where there is a will, there is a way.
- (d) Action without thought is folly.

## Unit-V

5. Do as directed any fifteen of the following : 15

(i) He is ..... M. P. (Insert a, an)

(ii) ..... you Mr. Rajen ?

(Fill with correct form of 'be')

(iii) We enjoyed ..... at the party last night.

(Fill in the blanks with 'self' form)

(iv) We ..... our lunch an hour ago.

(Use 'do' or 'have')

(v) The greedy man killed the goose ..... laid the golden eggs. (Use relative pronoun)

(vi) My bed is not very comfortable. Your bed is .....

(Use comparative degree of underlined word)

(vii) It is very pretty building. It is the ..... I have ever seen. (Use superlative degree)

(viii) Children ..... (enjoy) to play cricket.

(Use present indefinite or present continuous)

(ix) Here they are coming. (Correct the sentence)

(x) The volcano (create) have since it erupted.

(Use present perfect or present perfect continuous)

(xi) You ..... leave the office early today.

(Use suitable modal that shows 'permission')

(xii) There will be rush for seats when the train ..... (arrive). (Use correct tense)

(xiii) Who has broken the table ? (Change the voice)

(xiv) Please shut the door. (Change the voice)

(xv) Be honest.

You will lose your job. (Use either ..... or)

(xvi) He was cleared ..... all blame.

(Use preposition)

(xvii) He did not write to me.

He did not talk to me. (Use neither ..... nor)

(xviii) They live ..... Baker street. (Use preposition)

(xix) I like travelling by sea ..... it is not rough.

(Use if or unless)

(xx) Karan stayed out.

He did not study. (Complete using 'but')

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**B. C. A. (Part II) EXAMINATION, 2013**

Paper Seventh

**LINUX**

*Time : Three Hours ]*

*[ Maximum Marks : 50*

**Note :** Attempt any *two* parts from each Unit. All questions carry equal marks.

**Unit-I**

1. (a) What are the various system directories and files available in LINUX ?
- (b) Write down the steps for installing a Linux Red Hat in system.
- (c) How would you perform the following operations in Linux ?
  - (i) List all files beginning with the character 'A' on the screen.
  - (ii) Merge the contents of the file 'abc', 'xyz', sort them and display the sorted output on the screen.
  - (iii) What is the command for changing the permission of any file ?
  - (iv) What is the command for knowing how many users are currently logged with system.
  - (v) What is the command for create a background process ?

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### Unit-II

2. (a) What is Yanking ? Make difference between Yanking and delete in Linux.
- (b) What are the three modes of vi ? Explain the purpose of .exrc file ?
- (c) Write short notes on any two the following :
  - (i) Macros
  - (ii) Emacs features
  - (iii) Set Auto indent

### Unit-III

3. (a) Write a SHELL script to check the entered year is Leap year or not.
- (b) What do you understand by operators in Linux ? Explain logical operator with an example.
- (c) Write a SHELL script to display first 10 prime numbers.

### Unit-IV

4. (a) What are the facilities provided by GNOME and KDE to users ? Explain each of them in detail.
- (b) What is X-Window ? Also explain the term X-Window session in Linux.
- (c) Write short notes any two on the following :
  - (i) FVWM and FVWM96
  - (ii) Window manager
  - (iii) Step of setting wallpaper in KDE

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### Unit-V

5. (a) Explain the startup and shutdown process in Linux.
- (b) What do you understand by User and Group ? Explain how we create a user in Linux.
- (c) What do you understand by initab and profile file ? Explain the importance of it.

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**B. C. A. (Part II) EXAMINATION, 2013**

Paper First

**NUMERICAL ANALYSIS**

*Time : Three Hours ]*

*[ Maximum Marks : 50*

**Note :** Attempt any two parts from each question. All questions carry equal marks. Simple/Scientific calculator is allowed.

**Unit-I**

- i. (a) Give an example of transcendental algebraic equation. Find a real root of the equation :

$$f(x) = x^3 - 2x - 5 = 0$$

using bisection method in five stages.

- (b) Use Newton's method to find a root of the equation :

$$x^3 - 3x - 5 = 0$$

- (c) Find the root of the equation :

$$2x = \cos x + 3$$

correct to three decimal places using iterative method.

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## Unit-II

2. (a) Apply Gauss-Jordan method to solve the equations :

$$x + y + z = 9$$

$$2x - 3y + 4z = 13$$

$$3x + 4y + 5z = 40$$

- (b) Apply Cholesky's method to solve the equations :

$$3x + 2y + 7z = 4$$

$$2x + 3y + z = 5$$

$$3x + 4y + z = 7$$

- (c) Let  $X_1$  and  $X_2$  be two eigen vectors of a matrix  $A$  corresponding to the eigen value  $\lambda$ , then prove that  $X_1 + X_2$  is also an eigen vector of  $A$  corresponding to the same eigen value.

## Unit-III

3. (a) Define interpolation. From the following table, estimate the number of students who obtained marks between 40 and 45 :

Marks	No. of Students
30-40	31
40-50	42
50-60	51
60-70	35
70-80	31

- (b) Define extrapolation. Using Lagrange's interpolation formula, find the value of  $y$  for  $x = 5.5$  from the table ahead :

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$x$	$y = f(x)$
7	3
8	1
9	1
10	9

- (c) Compute  $f(2, 4, 9, 10)$  when  $f(x) = x^4 + x^2 + 1$ .

## Unit-IV

4. (a) Evaluate :

$$\int_0^6 \frac{dx}{1+x^2}$$

by using Trapezoidal rule.

- (b) Find the value of  $\log 2$  from  $\int_0^1 \frac{x^2}{1+x^3} dx$ , using Simpson's 1/3 rule by dividing the range into four equal parts.

- (c) A river is 80 metres wide. The depth  $d$  (in metres) of the river at a distance  $x$  from the bank is given by the following table :

$x$	$d$
0	0
10	4
20	7
30	9
40	12
50	15
60	14
70	8
80	2

Find approximately the area of cross-section of the river by Simpson's 3/8 rule.

## Unit-V

5. (a) Given  $\frac{dy}{dx} = \frac{y-x}{y+x}$  with the initial condition  $y = 1$  at  $x = 0$ . Find  $y$  for  $x = 0.1$  by Euler's method.
- (b) Using Taylor's series find the solution of the differential equation  $xy' = x - y$ ;  $y(2) = 2$  at  $x = 2.1$ , correct to the five places of decimal.
- (c) Use Picard's method to approximate  $y$  when  $x = 0.1$ ,  $x = 0.2$ , given that  $y = 0$ ,  $x = 0$ ,  $\frac{dy}{dx} = x + y$ .

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**B. C. A. (Part II) EXAMINATION, 2013**

Paper Eighth

**PRINCIPLES OF MANAGEMENT**

*Time : Three Hours ]*

*[ Maximum Marks : 50*

**Note :** Attempt all questions. All questions carry equal marks.

**Unit – I**

1. What do you mean by Management ? Discuss the tasks of a professional manager.

*Or*

What are the different approaches of management ?  
Discuss the behavioural approach.

**Unit – II**

2. Define Planning. Discuss in detail the steps of planning process.

*Or*

Write short notes on the following :

- (a) Significance of planning
- (b) Feasibility report

**Unit – III**

3. What do you understand by Organizing ? Explain the determinants of effectiveness organizing.

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*Or*

Write short notes on the following :

- (a) Staffing
- (b) Organizational structures

**Unit-IV**

4. Define Communication. What are the various barriers in effective communication ?

*Or*

What is Supervision ? Discuss the determinants of effective supervision.

**Unit-V**

5. Write a note on importance of controlling in an organization.

*Or*

Discuss the techniques and processes of decision-making.