

Roll No



**X-2596**

**B. C. A. (Part II) EXAMINATION, 2014**

Paper Sixth

**COMPUTER NETWORK AND INTERNET TECHNOLOGY**

*Time : Three Hours ]*

*[ Maximum Marks : 100*

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

**Unit—I**

1. (a) What do you mean by protocol, services and interfaces ? Explain network criteria and applications of computer network.
- (b) What do you mean by data transmission ? Explain different types of transmission mode with suitable example.
- (c) What is computer network ? Compare different categories of computer network.

**Unit—II**

2. (a) What do you mean by reference model ? Compare the OSI and TCP/IP reference model.
- (b) What is IP address ? Explain the different classes of IP addressing.
- (c) What do you understand by ISO ? Write the function of layers of OSI reference model.

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**Unit—III**

3. (a) Explain ASK, PSK and FSK of data communication in brief.
- (b) Explain the process of converting analog signal to digital signal.
- (c) Convert binary bits 10110 to digital signals using different encoding scheme.

**Unit—IV**

4. (a) Give some important security considerations with CGI programs. Explain any two of them.
- (b) Draw and explain the architecture of Internet. Also define the term 'www'.
- (c) Design a webpage using table, form, images and frames of HTML with suitable example.

**Unit—V**

5. (a) How to create a Java applet ? Explain with suitable example.
- (b) Explain with examples of the types of javascript functions.
- (c) Write short notes on the following :
- (i) DHTML
- (ii) Web Server

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**B. C. A. (Part II) EXAMINATION, 2014**

Paper Fourth

DBMS (ORACLE, SQL)

*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 various data models used in DBMS ?  
(b) What are the roles of database administration ?  
(c) What is the use of database system ?
2. (a) What is the difference between strong and weak entity set ?  
(b) Define specialization and generalization with example.  
(c) Construct an ER-diagram for hospital management, take appropriate, attributes, entity sets and relationships.
3. (a) What are the different types of joins ? Brief with example.

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- (b) What is the concept of primary key and foreign key? Explain with example.
- (c) Consider the following relation:
- Teacher (college-id, tname, class, subject)  
Student (college-id, rollno, sname, class, percent)
- Given a relational algebra expression for each of the following queries:
- (i) Select all students of class "B. Com I sem."  
(ii) Find teacher name who teach the student named as "Si".  
(iii) Find all first division students of college named as "EC".  
(iv) Find total number of teachers.
4. (a) What are the anomalies in 2NF and 1NF? Brief.  
(b) Explain functional dependencies with example.  
(c) What is normalization? What is the difference between BCNF and DKNF?
5. (a) Write the command to create table student having attributes stu\_name, rollno, class, age, percent and takes rollno as primary key. Write SQL command to select all first division students.  
(b) Explain the following:  
(i) Alter table  
(i) Update

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- (c) Consider the following relational schema:

Doctor (did, dname, hosid, pid)

Hospital (hosid, hosname)

Patient (pid, pname, disease, admitdate, discharge\_date)

Write SQL command for the following query:

- (i) Find the name of all doctors and their hospital.  
(ii) Find the name of doctors who are treating more than 10 patients.  
(iii) Find the number of patient who are admitted for more than 5 days.  
(iv) Find the name of doctor who is treating patient whose name is "XYZ".

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**B. C. A. (Part II) EXAMINATION, 2014**

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  $y = e^{a \sin^{-1} x}$ , prove that :  
 $(1 - x^2) y_{n+2} - (2n + 1) x y_{n+1} - (n^2 + a^2) y_n = 0$
- (b) Expand  $e^x$  in powers of  $(x - 1)$ .
- (c) Expand  $e^{x \cos x}$  by Maclaurin's theorem.

**Unit—II**

2. (a) Find the asymptotes of the curve :  
 $x^3 + y^3 = 3axy$
- (b) Find the radius of curvature at the point  $(r, \theta)$  of the curve :

$$\theta = \frac{\sqrt{r^2 - a^2}}{a} - \cos^{-1} \left( \frac{a}{r} \right)$$

- (c) Show that the points of inflexion of the curve  $y^2 = (x - a)^2 (x - b)$  lie on the line  $3x + a = 4b$ .

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## Unit—III

3. (a) If
- $\theta = t^n e^{-r^2/4t}$
- , what value of
- $n$
- will make

$$\frac{1}{r^2} \frac{\partial}{\partial r} \left( r^2 \frac{\partial \theta}{\partial r} \right) = \frac{\partial \theta}{\partial t} ?$$

- (b) If:

$$u = \sin^{-1} \left( \frac{x^2 + y^2}{x + y} \right)$$

then show that:

$$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$$

- (c) If:

$$u = x^2 + y^2 + z^2$$

$$v = x + y + z$$

$$w = xy + yz + zx$$

show that the Jacobian  $\frac{\partial(u, v, w)}{\partial(x, y, z)}$  vanishes.Find the relation between  $u$ ,  $v$  and  $w$ .

## Unit—IV

4. (a) Evaluate:

$$\int \frac{2x+5}{\sqrt{x^2+3x+1}} dx$$

- (b) Evaluate:

$$\int \frac{x \tan^{-1} x}{(1+x^2)^{3/2}} dx$$

- (c) Find the value of:

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

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## Unit—V

5. (a) Evaluate:

$$\int_0^1 \int_{y^2}^1 \int_0^{1-x} x \, dy \, dx \, dz$$

- (b) Change the order of integration in:

$$I = \int_0^1 \int_y^1 x^2 \cos(x^2 - xy) \, dy \, dx$$

- (c) Find the length of the parabola
- $y^2 = 4ax$
- from the vertex to an extremity of the latus-rectum.

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**B. C. A. (Part II) EXAMINATION, 2014**

Paper Third

**DATA STRUCTURE**

*Time : Three Hours ]*

*[ Maximum Marks : 50*

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

1. (a) Define data structure. Categorise them in detail.  
(b) What is a generic abstract data type and how is it different from the abstract data types ?  
(c) Differentiate between array of pointers and pointer to pointer.
2. (a) Calculate the address of X [4] [3] in a two-dimensional array X [1 ..... 5] [1 ..... 4] stored in row major order. Assume the base address to be 1000 and each element requires 4 words of storage.  
(b) What is record ? Explain record structures.  
(c) Show the bubble sort steps for the following numbers :  
10, 72, 25, 04, 15, 21
3. (a) Explain and write an algorithm to insert a node into a linked list at various positions.

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- (b) What is priority queue ? Explain.
- (c) What is Stack ? Explain array representation of stack.
4. (a) Explain various steps for AVL search tree insertion.
- (b) A tree (binary) T has 9 nodes. The in-order and pre-order traversal of T yields the following sequence of nodes :

In-order	Pre-order
5	6
1	1
3	5
9	9
6	3
8	4
4	2
2	7
7	2

- (c) Write the types of tree. Explain the procedure of deleting in binary tree.
5. (a) Explain multiway merge sort.
- (b) Write an algorithm to sort list of elements using selection sort technique.
- (c) Write an algorithm to sort a list of elements using insertion sort technique.

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**B. C. A. (Part II) EXAMINATION, 2014**

Paper Eighth

**PRINCIPLES OF MANAGEMENT**

*Time : Three Hours ]*

*[ Maximum Marks : 50*

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

**Unit—I**

1. "Increasing industrial complexities have contributed in the development of management." Do you agree ?

*Or*

Discuss critically the contribution and philosophy of Taylor as regards to management.

**Unit—II**

2. Define planning. Discuss its objective and point out the characteristics of effective planning.

*Or*

Write short notes on the following :

- (a) Planning process
- (b) Feasibility report

**Unit—III**

3. Differentiate between formal and informal organisation. What policy should be adopted by management towards informal organisation ?

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*Or*

What is Span of Management ? Explain the merits and demerits of narrow and wide span of management.

**Unit—IV**

4. What do you understand by leadership ? Describe briefly the various styles of leadership.

*Or*

Write short notes on the following :

- (a) McGregor's Theory X and Theory Y
- (b) Elements of effective communication

**Unit—V**

5. What do you understand by decision-making ? Discuss the process of scientific decision-making.

*Or*

Discuss the importance and limitations of control.

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**B. C. A. (Part II) EXAMINATION, 2014**

Paper Seventh

LINUX

*Time : Three Hours ]*

*[ Maximum Marks : 50*

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

1. (a) Briefly describe the architecture of Linux.  
(b) What are the different distributions of Linux ?  
(c) Write the command for the following :
  - (i) Write the command to display current user of the system.
  - (ii) List the file whose name is ending with 'h'.
  - (iii) Write the command to give read, write and execute permission to the owner only.
  - (iv) Write command for pattern matching.
  - (v) Write a command to change directory.
2. (a) What is vi editor ? How can we switch from text mode to command mode ?  
(b) Explain the following :
  - (i) Command macros
  - (ii) Yanking
- (c) Explain E<sub>mac</sub> with its features.

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3. (a) Write a shell script to calculate the sum of digits of entered number.  
(b) What are the functions performed by shell and types of shell ?  
(c) Write a shell script to find the smallest number among three numbers.
4. (a) Write short notes on the following :
  - (i) X-windows
  - (ii) FVWM and PVWM 95  
(b) Write the task performed by Windows Manager.  
(c) Explain the working environment of GNOME.
5. (a) What is the role of system administrator ?  
(b) What are the different access permission ?  
(c) Write a step to create user in LINUX and explain user and group.

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**B. C. A. (Part II) EXAMINATION, 2014**

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**

1. (a) Find the root of the equation  $x^3 - x - 4 = 0$  using the bisection method.
- (b) Find the root of  $x^2 - 5x + 2 = 0$  correct of five decimal places by Newton-Raphson method.
- (c) Solve the equation :

$$6x^4 - 13x^3 - 35x^2 - x + 3 = 0$$

one root being  $2 - \sqrt{3}$ .

**Unit—II**

2. (a) Solve the equations :

$$x + 4y - z = -5$$

$$x + y - 6z = -12$$

$$3x - y - z = 4$$

using Gauss-Jordan method.

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- (b) Solve the system of linear equations:

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

$$2x + 8y + 22z = 6$$

$$3x + 22y + 82z = -10$$

using the Cholesky method.

- (c) Find the inverse of the matrix:

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$$

by Gauss-Jordan method.

## Unit-III

3. (a) Interpolate
- $f(2)$
- from the following data:

$x$	$f(x)$
1	7
2	?
3	13
4	21
5	37

and explain why the value obtained is different from that obtained by putting  $x=2$  in the expression  $2^x + 5$ .

- (b) Compute
- $f(2, 4, 9, 10)$
- when:

$$f(x) = x^4 + x^2 + 1.$$

- (c) Find the value of
- $x$
- correct to two decimal places lying between 15 and 20 satisfying the equation:

$$x^2 + 250 \log_{10} x = 635$$

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## Unit-IV

4. (a) Given:

$x$	$y = f(x)$
0.1	1.10517
0.2	1.22140
0.3	1.34986
0.4	1.49182

Find  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  at  $x = 0.4$ .

- (b) Show that:

$$\int_0^1 \frac{dx}{1+x} = 0.69315.$$

- (c) Using Simpson's '1/3' rule evaluate:

$$\int_{0.5}^{0.7} x^{1/2} e^{-x} dx.$$

## Unit-V

5. (a) Use Picard's method to approximate
- $y$
- when
- $x = 0.1, x = 0.2$
- , given that:

$$y = 0, x = 0, \frac{dy}{dx} = x + y$$

- (b) Solve
- $\frac{dy}{dx} = 1 - 2xy$
- given that
- $y(0) = 0$
- by Taylor's series.

- (c) Use Runge-Kutta method of fourth order to solve:

$$y' = xy \text{ for } x = 1.2. \text{ Initially } x = 1, y = 2 \text{ (take } h = 0.1).$$

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