

# Yogi Vemana University, Vemanapuram, KADAPA

## REVISED SYLLABUS OF B. Com (COMPUTER APPLICATIONS) UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-21

### PROGRAMME: Three-Year BCom(Computer Applications)

#### Structure of B.Com (Computer Applications) Programme under Revised CBCS

Sl. No	Course Code	Sem	Name of Course (Each Course consists 5 Units with each Unit having 12 hours of class-work)	Hours/Week	Credits	Marks	
						Mid Sem	Sem End
1	1C	I	Information Technology	4	3	25	75
2	1C-P	I	Information Technology Lab	2	2		50
3	2C	II	E-commerce and Web Designing	4	3	25	75
4	2C-P	II	E-commerce and Web Designing Lab	2	2		50
5	3C	III	Programming with C & C++	4	3	25	75
6	3C-P	III	Programming with C & C++ Lab	2	2		50
7	4F	IV	Data Base Management System	4	3	25	75
8	4F-P	IV	Data Base Management System Lab	2	2		50
<b>Total</b>				<b>24</b>	<b>20</b>	<b>100</b>	<b>500</b>

**Note:** For every semester there will be an external practical examination, as per the APSICHE guidelines

Semester-wise Syllabus under CBCS(w.e.f. 2020-21 Admitted Batch)

### **I Year B Com (CA), Semester- I**

#### **Discipline: COMPUTER APPLICATIONS**

#### **Course 1C: Information Technology**

Semester	CourseCode	CourseTitle	Hours	Credits
I	1C	Information Technology	60	3

**Model Outcomes:**

At the end of the course, the students is expected to DEMONSTRATE the following cognitive abilities (thinking skill) and psychomotor skills.

*A. Remembers and states in a systematic way (Knowledge)*

1. Describe the fundamental hardware components that make up a computer's hardware and the role of each of these components
2. understand the difference between an operating system and an application program, and what each is used for in a computer
3. Use technology ethically, safely, securely, and legally
4. Use systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems

*B. Explains (Understanding)*

5. Apply standard statistical inference procedures to draw conclusions from data
6. Retrieve information and create reports from databases
7. Interpret, produce, and present work-related documents and information effectively and accurately

*C. Critically examines, using data and figures (Analysis and Evaluation\*\*)*

8. Analyse compression techniques and file formats to determine effective ways of securing, managing, and transferring data
9. Identify and analyse user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing based systems.
10. Analyse a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
11. Identify and analyse computer hardware, software

*D. Working in 'Outside Syllabus Area' under a Co-curricular Activity(Creativity)*

Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.

*E. Efficiently learn and use Microsoft Office applications.*

## Syllabus:

# Course 1C :Information Technology

(Five units with each unit having 12 hours of class work)

Unit	Details
<b>I Introduction:</b>	Computer Definition - Characteristics and Limitations of Computer— Generations of Computer, Classification of Computers, Applications of Computer, Basic Components of PC, Computer Architecture - Primary and Secondary Memories- Input and Output Devices- Operating System- Function of Operating System- Types of Operating System- Languages and its Types
<b>II MS word:</b>	Word Processing – Features-Advantages and Applications- Parts of Word Window- Toolbar-Creating, Saving, Closing, Opening and Editing of a Document-Moving and Coping a Text-Formatting of Text and Paragraph- Bullets and Numbering-Find and Replace - Insertion of objects-Headers and Footers- Page Formatting- Auto Correct- Spelling and Grammar- Mail Merge- Macros
<b>III MS Excel:</b>	Features – Spread Sheet-Workbook – Cell-Parts of a window-Saving, Closing, Opening of a Work Book – Editing – Advantages – Formulas- Types of Function- Templates – Macros – Sorting- Charts – Filtering.
<b>IV MS Power point:</b>	Introduction – Starting – Parts-Creating of Tables- Create Presentation – Templates- Auto Content Wizard-Slide Show-Editing of Presentation-Inserting Objects and charts
<b>V MS Access:</b>	Orientation to Microsoft Access - Create a Simple Access Database - Working with Table Data - Modify Table Data - Sort and Filter Records - Querying a Database -

Create Basic Queries - Sort and Filter Data in a Query - Perform Calculations in a Query - Create Basic Access Forms - Work with Data on Access Forms - Create a Report - Add Controls to a Report - Format Reports

### **Learning Resources (Course 1C:Information Technology)**

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#### **References:**

- (1) P.Mohan computer fundamentals- HimalayaPublications.
- (2) R.K.Sharma and Shashi K Gupta, Computer Fundamentals - Kalyani Publications
- (3) Fundamentals of Computers ByBalagurusamy, Mcgraw Hill
- (4) Computer Fundamentals Anita Goel Pearson India
- (5) Introduction to Computers Peter Norton
- (6) Fundamentals of Computers Rajaraman V Adabala N
- (7) Office 2010 All-in-One For Dummies Peter Weverka
- (8) MS-Office S.S. Shrivastava
- (9) MS-OFFICE 2010 Training Guide Prof. Satish Jain, M. Geetha, KratikaBPB Publications

#### **Online Resources:**

- <https://support.office.com/en-us/office-training-center>
- <https://www.skillshare.com/browse/microsoft-office>
- [https://www.tutorialspoint.com/computer\\_fundamentals/index.htm](https://www.tutorialspoint.com/computer_fundamentals/index.htm)
- <https://www.javatpoint.com/computer-fundamentalstutorial>
- <https://edu.gcfglobal.org/en/subjects/office/>
- <https://www.microsoft.com/en-us/learning/training.aspx>

### **RECOMMENDED CO-CURRICULAR ACTIVITIES:**

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

#### **Measurable**

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Field studies (individual observations and recordings as per syllabus content and related areas (Individual or team activity))
5. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

**General**

1. Group Discussion
2. Visit to Software Technology parks / industries

**RECOMMENDED CONTINUOUS ASSESSMENT METHODS:**

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Coding exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports,
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work

**Course 1C – P :Information Technology Lab**

Semester	CourseCode	CourseTitle	Hours	Credits
I	1C-P	Information Technology Lab	30	2

**Practical Component: @ 2 hours/week/batch**

- Creation of invitation using Ms – word

- Create mail merge in Ms –Word
- Create Macros in Ms – word
- The ABC Company shows the sales of different products for 5 years.
- Create column chart, 3D-column and Bar chart for the following data

YEAR	PRODUCT-1	PRODUCT-2	PRODUCT-3	PRODUCT-4
2003	1000	800	900	1000
2004	800	80	500	900
2005	1200	190	400	800
2006	400	200	300	1000
2007	1800	400	400	1200

- Create a suitable examination data base and find the sum of the marks(total) of each student and respective class secured by the student rules:  
 Pass if marks in each subject  $\geq 35$ , Distinction if average  $\geq 75$ , First class if average  $\geq 60$  but  $< 75$   
 Second class if average  $\geq 50$  but  $< 60$ , Third class if average  $\geq 35$  but  $< 50$ , Fail if marks in any subject is  $< 35$ . Display average marks of the class, subject wise and pass percentage.

- Create MS power point Presentation with animation
- creation of database in Ms – access using table object
- Create a query in Ms – access and display the result
- Generate reports using reports wizard in Ms – access
- Create forms using form wizard in Ms - access

### Course 2C: E- Commerce & Web Designing

Semester	CourseCode	CourseTitle	Hours	Credits
<b>II</b>	<b>2C</b>	<b>E-Commerce &amp; Web Designing</b>	<b>60</b>	<b>3</b>

### **Learning Outcomes:**

At the end of the course, the students is expected to DEMONSTRATE the following cognitive abilities (thinking skill) and psychomotor skills.

*B. Remembers and states in a systematic way (Knowledge)*

1. Understand the foundations and importance of E-commerce
2. Define Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational
3. Describe the infrastructure for E-commerce
4. Discuss legal issues and privacy in E-Commerce
5. Understand the principles of creating an effective web page, including an in-depth consideration of information architecture

*B. Explains (Understanding)*

6. Recognize and discuss global E-commerce issues
7. Learn the language of the web: HTML and CSS.

*C. Critically examines, using data and figures (Analysis and Evaluation)*

8. Analyze the impact of E-commerce on business models and strategy
9. Assess electronic payment systems
10. Exploring a web development framework as an implementation example and create dynamically generated web site complete with user accounts, page level security, modular design using css

*D. Working in 'Outside Syllabus Area' under a Co-curricular Activity(Creativity)*

Use the Systems Design Approach to implement websites with the following steps:

- Define purpose of the site and subsections
- Identify the audience
- Design and/or collect site content
- Design the website theme and navigational structure
- Design & develop web pages including: CSS Style Rules, Typography, Hyperlinks, Lists, Tables, Frames, Forms, Images, Behaviours, CSS Layouts

E. Build a site based on the design decisions and progressively incorporate tools and techniques covered

## **SYLLABUS**

### **Course 2C: E-commerce & Web Designing**

**I Unit I: Introduction:**

Meaning, Nature, Concepts, Advantages, Disadvantages and reasons for Transacting Online, Types of E-Commerce, e-commerce Business Models (Introduction , Key Elements of a Business Model And Categorizing Major E-Commerce Business Models), Forces Behind e-commerce.

**Technology used in E-commerce:** The dynamics of World Wide Web and Internet (Meaning, Evolution And Features); Designing, Building and Launching e-commerce website (A systematic approach involving decisions regarding selection of hardware, software, outsourcing Vs. in-house development of a website)

**II Unit-II: E-payment System:**

Models and methods of e-payments (Debit Card, Credit Card, Smart Cards, e-money), Digital Signatures (Procedure, Working And Legal Position), Payment Gateways, Online Banking (Meaning, Concepts, Importance, Electronic Fund Transfer, Automated Clearing House, Automated Ledger Posting), Risks Involved in e-payments.

**III Unit-III: On-line Business Transactions:**

Meaning, Purpose, Advantages and Disadvantages of Transacting Online, E-Commerce Applications in Various Industries Like {Banking, Insurance, Payment of Utility Bills, Online Marketing, E-Tailing (Popularity, Benefits, Problems and Features), Online Services (Financial, Travel and Career), Auctions, Online Portal, Online Learning, Publishing and Entertainment} Online Shopping (Amazon, Snap Deal, Alibaba, Flipkart, etc.)

**IV Unit-IV: Website designing**

Designing a home page, HTML document, Anchor tag Hyperlinks, Head and body section, Header Section, Title, Prologue, Links, Colorful Pages, Comment, Body Section, Heading Horizontal Ruler, Paragraph, Tabs, Images And Pictures, Lists and Their Types, Nested Lists, Table Handling.



## **v Unit V: Advanced Website Designing:**

Frames: Frameset Definition, Frame Definition, Nested Framesets, Forms and Form Elements. DHTML and Style Sheets: Defining Styles, elements of Styles, linking a style sheet to a HTML Document, Inline Styles, External Style Sheets, Internal Style Sheets & Multiple Style Sheets.

### **Learning Resources (Course 2C: E-commerce & Web Designing)**

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#### **References:**

- (1) E-commerce and E-business Himalaya publishers
- (2) E-Commerce by Kenneth C Laudon, PEARSON INDIA
- (3) Web Design: Introductory with MindTap Jennifer T Campbell, Cengage India
- (4) HTML & WEB DESIGN:TIPS& TECHNIQUES JAMSA, KRIS, McGraw Hill
- (5) Fundamentals Of Web Development by Randy Connolly, Ricardo Hoar, Pearson
- (6) HTML & CSS: COMPLETE REFERENCE POWELL, THOMAS, McGrawHill

#### **Online Resources:**

<http://www.kartrocket.com>

<http://www.e-commerceceo.com>

<http://www.fastspring.com>

<https://teamtreehouse.com/tracks/web-design>

#### **RECOMMENDED CO-CURRICULAR ACTIVITIES:**

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

#### **MEASURABLE**

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Field studies (individual observations and recordings as per syllabus content and related areas (Individual or team activity))

5. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

## **GENERAL**

Group Discussion

Visit to Software Technology parks / industries

## **RECOMMENDED CONTINUOUS ASSESSMENT METHODS:**

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Coding exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports,
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work

### **Course 2C - P: E- Commerce & Web Designing Lab**

<b>Semester</b>	<b>CourseCode</b>	<b>CourseTitle</b>	<b>Hours</b>	<b>Credits</b>
<b>II</b>	<b>2C- P</b>	<b>E-Commerce &amp; Web Designing Lab</b>	<b>30</b>	<b>2</b>

**Practical Component:@ 2 hours/week/batch**

1. Creation of simple web page using formatting tags
2. Creation of lists and tables with attributes
3. Creation of hyperlinks and including images
4. Creation of forms
5. Creation of framesets
6. Cascading style sheets – inline, internal and external

**Course 3C: Programming with C & C++**

(Five units with each unit having 12 hours of class work)

Semester	CourseCode	CourseTitle	Hours	Credits
III	3C	Programming with C & C++	60	3

**Model Outcomes:**

At the end of the course, the students is expected to DEMONSTRATE the following cognitive abilities (thinking skill) and psychomotor skills.

*C. Remembers and states in a systematic way (Knowledge)*

1. Develop programming skills
2. Declaration of variables and constants use of operators and expressions
3. learn the syntax and semantics of programming language
4. Be familiar with programming environment of C and C++
5. Ability to work with textual information (characters and strings) & arrays

*D. Explains (Understanding)*

6. Understanding a functional hierarchical code organization
7. Understanding a concept of object thinking within the framework of functional model

8. Write program on a computer, edit, compile, debug, correct, recompile and run it

*E. Critically examines, using data and figures (Analysis and Evaluation)*

9. Choose the right data representation formats based on the requirements of the problem

10. Analyze how C++ improves C with object-oriented features

11. Evaluate comparisons and limitations of the various programming constructs and choose correct one for the task in hand.

*D. Working in 'Outside Syllabus Area' under a Co-curricular Activity(Creativity)*

Planning of structure and content, writing, updating and modifying computer programs for user solutions

*E. Exploring C programming and Design C++ classes for code reuse (Practical skills\*\*\*)*

## **SYLLABUS**

### **Course 3C: Programming with C & C++**

<b>Unit</b>	<b>Details</b>
<b>I</b>	<b>Introduction and Control Structures:</b> History of 'C' - Structure of C program – C character set, Tokens, Constants, Variables, Keywords, Identifiers – C data types - C operators - Standard I/O in C - Applying if and Switch Statements
<b>II</b>	<b>Loops And Arrays:</b> Use of While, Do While and For Loops - Use of Break and Continue Statements - Array Notation and Representation - Manipulating Array Elements - Using Multi Dimensional Arrays

### III Strings and Functions:

Declaration and Initialization of String Variables - String Handling Functions -Defining Functions - Function Call - Call By Value, Call By Reference – Recursion

### IV Classes and Objects

Introduction to OOP and its basic features - C++ program structure - Classes and objects - Friend Functions-Constructor – Types of constructors – Destructors.

### V Inheritance:

Inheritance - Types of Inheritance -Types of derivation- Public – Private - Protected Hierarchical Inheritance - Multilevel Inheritance – Multiple Inheritance - Hybrid Inheritance

## Learning Resources (Course 3C: : Programming with C & C++)

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### References:

- (1) E. Balagurusamy "Object oriented programming with C++
- (2) R.Ravichandran "Programming with C++"
- (3) Mastering C by K R Venugopal and Sudeep R Prasad, McGraw Hill
- (4) Expert C Programming: Deep Secrets Kindle Edition [Peter van der Linden](#)
- (5) Let Us C [YashavantKanetkar](#)
- (6) The C++ Programming Language [Bjarne Stroustrup](#)
- (7) C++ Primer [Stanley B. Lippman](#), [Josée Lajoie](#), [Barbara E. Moo](#)

### Online Resources:

<https://www.tutorialspoint.com/cprogramming/index.html>

<https://www.learn-c.org/>

<https://www.programiz.com/c-programming>

<https://www.w3schools.in/c-tutorial/>

<https://www.cprogramming.com/tutorial/c-tutorial.html>

<https://www.tutorialspoint.com/cplusplus/index.html>

<https://www.programiz.com/cpp-programming><http://www.cplusplus.com/doc/tutorial/>

<https://www.learn-cpp.org/>

<https://www.javatpoint.com/cpp-tutorial>

### **Course 3C – P : Programming with C & C++ Lab**

<b>Semester</b>	<b>CourseCode</b>	<b>CourseTitle</b>	<b>Hours</b>	<b>Credits</b>
<b>III</b>	<b>3C - P</b>	<b>Programming with C &amp; C++ Lab</b>	<b>30</b>	<b>2</b>

1. Write C programs for
  - a. Fibonacci Series
  - b. Prime number
  - c. Palindrome number
  - d. Armstrong number.
2. 'C' program for multiplication of two matrices
3. 'C' program to implement string functions
4. 'C' program to swap numbers
5. 'C' program to calculate factorial using recursion
6. 'C++' program to perform addition of two complex numbers using constructor
7. Write a program to find the largest of two given numbers in two different classes using friend function
8. Program to add two matrices using dynamic constructor
9. Implement a class string containing the following functions:
  - a. Overload + operator to carry out the concatenation of strings.
  - b. Overload == operator to carry out the comparison of strings.
10. Program to implement inheritance.

### **Course 4F:Database Management System**

(Five units with each unit having 12 hours of class work)

Semester	CourseCode	CourseTitle	Hours	Credits
IV	4F	Database Management System	60	3

### Model Outcomes for Database Management System

At the end of the course, the students is expected to DEMONSTRATE the following cognitive abilities (thinking skill) and psychomotor skills.

*F. Remembers and states in a systematic way (Knowledge)*

1. Understand the role of a database management system in an organization.
2. Understand basic database concepts, including the structure and operation of the relational data model.
3. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization
4. Understand Functional Dependency and Functional Decomposition

*G. Explains (Understanding)*

5. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.
6. Perform PL/SQL programming using concept of Cursor Management, Error Handling, Packages

*H. Critically examines, using data and figures (Analysis and Evaluation)*

7. Apply various Normalization techniques
8. Model an application's data requirements using conceptual modeling tools like ER diagrams and design database schemas based on the conceptual model

**D. Working in 'Outside Syllabus Area' under a Co-curricular Activity(Creativity)**  
Design and implement a small database project

**E. Construct simple and moderately advanced database queries using Structured Query Language (SQL)(Practical skills)**

### SYLLABUS

## Course 4F: Database Management System

Unit	Details
<b>I</b>	<b>Overview of Database Management System</b> Introduction, Data and Information, Database, Database Management System, Objectives of DBMS, Evolution of Database Management System, Classification of Database Management System.
<b>II</b>	<b>File-Based System</b> File Based System. Drawbacks of File-Based System, DBMS Approach, Advantage of DBMS, Data Models, Components of Database System, Database Architecture, DBMS Vendors and their products.
<b>III</b>	<b>Entity-Relationship Model:</b> Introduction, The Building Blocks of an Entity-Relationship, Classification of Entity Set, Attribute Classification, Relationship Degree, Relationship Classification, Generalization and Specialization, Aggregation and Composition, CODD's Rules, Relational Data Model, Concept of Relational Integrity.
<b>IV</b>	<b>Structured Query Language</b> Introduction, History of SQL Standards, Commands in SQL, Data types in SQL, Data Definition Language (DDL), Selection Operation Projection Operation, Aggregate Functions, Data Manipulation Language, Table Modification, Table Truncation, Imposition of Constraints, Set Operations.
<b>V</b>	<b>PL/SQL:</b> Introduction, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Control Structure, Steps to Create a PL/SQL Program, Iterative Control Cursors, Steps to Create a Cursor, Procedure, Functions, Packages, Exceptions Handling, Database Triggers, Types of triggers.

### **Learning Resources (Course 4F: Database Management System)**

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#### **References:**



1. Paneerselvam:Database Management system,PHI.
2. David Kuklinski, Osborne, Data management system McGraw Hill Publication.
3. Shgirley Neal And Kenneth LC Trunik Database management system in Business-PHI.
4. Godeon C. EVEREST, Database Management-McGraw Hill Book Company.
5. MARTIN,Database Management-Prentice Hall of India, New Delhi.
6. Bipin C.Desai , `An Introduction to Database System`,Galgotia Publications
7. Korth, Database Management System.
8. Navathe, Database Management System.
9. S. Sumathi, S. Esakkirajan,Fundamentals of Relational Database Management System

**Online resources:**

[http:// www.onlinegdb.com/](http://www.onlinegdb.com/)

[http:// www.tutorialspoint.com/](http://www.tutorialspoint.com/)

<http://learnsql.com>

<https://www.codecademy.com/learn/learn-sql/>

<https://www.w3schools.com/sql/default.asp>

**Course 4F – P : Database Management System Lab**

Semester	CourseCode	CourseTitle	Hours	Credits
IV	4F - P	Database Management System Lab	30	2

1. Create tables department and employee with required constraints.
2. Initially only the few columns (essential) are to be added. Add the remaining columns separately by using appropriate SQL command.
3. Basic column should not be null
4. Add constraint that basic should not be less than 5000.
5. Calculate hra, da, gross and net by using PL/SQL program.
6. The percentage of hra and da are to be stored separately.
7. When the da becomes more than 100%, a message has to be generated and with user permission da has to be merged with basic.

8. Empno should be unique and has to be generated automatically.

## Recommended Format for Question Paper

For Courses 1C, 2C, 3C, 4F

Time: 3 Hours

[Max. Marks : 75]

### Section-A [5X5=25]

Answer any **FIVE** of the following questions.

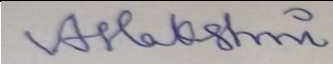
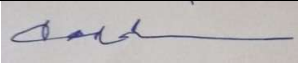
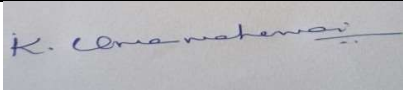
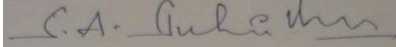
- 1 Contents of **Unit-I**
- 2 Contents of **Unit-II**
- 3 Contents of **Unit-III**
- 4 Contents of **Unit-IV**
- 5 Contents of **Unit-V**
- 6 Contents of **Unit-I to Unit V**
- 7 Contents of **Unit-I to Unit V**
- 8 Contents of **Unit-I to Unit V**

### Section-B [5X10=50]

Answer **FIVE** questions

- 9 a Contents of **Unit-I**
- (OR)
- 9 b Contents of **Unit-I**
  
- 10 a Contents of **Unit-II**
- (OR)
- 10 b Contents of **Unit-II**
  
- 11 a Contents of **Unit-III**
- (OR)
- 11 b Contents of **Unit-III**
  
- 12 a Contents of **Unit-IV**
- (OR)
- 12 b Contents of **Unit-IV**
  
- 13 a Contents of **Unit-V**
- (OR)
- 13 b Contents of **Unit-V**

## Board of Studies Computer Science, Applications & IT

Chair Person	Dr. A. Sri Lakshmi	
Member	Dr. C. Nageswara Raju	
Member	Smt. K. Uma Maheswari	
Member	Sri. Shaik Abjal Jeelani Basha	
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