

Syllabus
of
Bachelor of Computer
Application
(Three Years Degree Course)

**BCA – I
SEMESTER - I
Paper -I: ENGLISH
(1BCA1)**

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SEMESTER - I
Paper -II: Marathi
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Marathi

BCA - I
SEMESTER - I
PAPER-III: TRENDS IN INFORMATION TECHNOLOGY
(1BCA3)

UNIT-I: Basic of Computer

Introduction to Computer, Types and Classification. **Basic Anatomy of Computer:** Block Diagram. **CPU:** Function of Each Unit. **Memory:** Primary, Cache, Flash, Storage **Classification:** Sequential, Random. **Storage Devices:** Pen Drive, Hard Disk, and Optical Disk, Blue Ray Disc.

UNIT-II: Input/ Output Peripherals

Input Devices: Keyboard **Locator Device:** Mouse, Joy Stick, Digitizing Tablet **Pick Device:** Light Pen, Touch Screen, Track Ball, **Voice Recognition:** Microphone, **Scanning:** MICR, OCR, OMR, Barcode Reader, **Vision Capturing:** Webcam, Digital Camera Point of Scale, Touch Pad, Smart Card **Output Devices:** VDU, Dot Matrix, Laser and Inkjet Printers, Plotters.

UNIT-III: Current Trends

Wireless : Mobile Internet, GPS, 3G, 4G, Wi-Fi, Bluetooth, Social Networking, Cloud Technology, Wireless Application Protocol, Bioinformatics, Open Source Software, Firewall, E-Commerce, M-Commerce, Nanotechnology, Virtual Reality, iPod, Social and Ethical Issue, YouTube, FaceBook, LinkedIn, Orkut

UNIT-IV: Advanced Trends in IT

Bayesian Network, Neural Network, Grid Computing, Intelligent Software Agent, Expert System, Virtual LAN Technology, Distributed Computing, OLAP, Data Mining, BPO & KPO, Artificial Intelligence, ERP, E-Banking, SCADA (Supervisory Control and Data Acquisition)

New Vision and Idea – Dr. Vijay P. Bhatkar, Aziz H. Premji, Narayan Murthy, Charles Babbage, Jhon Von Neumann, Tim Bernes-Lee, Steve Jobs, Bill Gates, Lady Ada Lovelace

Books:

- 1) Aksoy, "Introduction to Information Technology", Cengage, ISBN: 9788131505915
- 2) Dr. Madhulika Jain, Shashank & Satish Jain, "Information technology Concepts", BPB Publication, New Delhi, ISBN-- 8176562769
- 3) Kamlesh Agarwal, "WAP the NET", MacMillan Publication.
- 4) Verma, "Computer, Internet & Multimedia – Dictionary", Universities Press

References:

- 1) Rao, "Information Technology for Real World Problem", Universities Press, ISBN- 978-81-7371-734-5
- 2) Douglas Comer, "The Internet Book", PHI Publication, ISBN- 0132335530
- 3) Peter Norton's, "Introduction to Computers", 4TH Ed. TMH Pub., ISBN-0070593744
- 4) Alexis and Mathews Leon, "Fundamentals of Information Technology" Leon Press, Chennai & Vikas Publishing House Pvt. Ltd, New Delhi, ISBN- 8182090105

BCA – I
SEMESTER - I
PAPER IV: PROGRAMMING TOOLS AND TECHNIQUES
(1BCA4)

UNIT-I: Language Evolution

Machine Language, Assembly Language, High Level Language. **Translators:** Compiler, Interpreter and Assembler. The Compilation Process, Linker, Loader, Study of Programming Language (Procedure Oriented, Object-Base, Event-Base), Study of HLL, Characteristics of Good Language, Generation of Languages.

UNIT-II: Programming Construction Tools

Problem Analysis, Process Analysis, Conceptual Development of Solution. Development Tools: **Algorithm:** Types of Algorithm, Algorithm of Analysis, Advantage and Disadvantage of Algorithm, Complexity of Algorithm, Big-O Notation **Flowcharts:** Types of Flowcharts, Advantage and Disadvantage of Flowchart. **Pseudo Code:** Definition and Its Characteristics

UNIT-III: Control Statements

Basics of Programming Language: Use of Character Set, Meaning of Keywords and Identifiers, Role of Data Types, Constants and Variables. Importance of Casting, Different Types of Operators and their Precedence, Expressions, Conditional Statements (One-Way, Two-Way and Multi-Way Conditional), Looping Statements (For, While, do-while), Usage of Exit, Continue, Break and Goto Statement.

UNIT-IV: Arrays

Arrays: Arrays, One dimensional array, Various Operation on Array (Inserting of Element, Deleting of Element, Rotating List, Sorting, Searching, Merging Etc) and Two dimensional arrays (Matrix Addition, Transpose of Matrix, Matrix Multiplication), Modular programming and its features.

Books:

- 1) Anil V. Chouduri, "The Art of Programming through Flowchart and Algorithms", Laxmi Pub. ISBN-8170087791
- 2) R.G. Dromey, "How to Solve it by Computer", Pearson, ISBN 978-81-317-0562-9
- 3) Behrouz Forouzan, "Basic of Computer Science", Cengage Learning, ISBN 81-315-1118-9
- 4) Koren, "Computer Arithmetic Algorithm", Universities Press, ISBN- 9788173715334

References:

- 1) Donald Knuth, "The Art of Computer Programming Vol-I,II III", Pearson.
- 2) Horowitz, Sahani, "Fundamental of Computer Algorithm", Orient Longman, ISBN 9788173716126
- 3) Maureen Sprankle, "Problem Solving Programming Concepts", Pearson, 7th Edition, 2009 ISBN 81-317-0711-1

BCA - I
SEMESTER - I
PAPER- V- DIGITAL ELECTRONICS & MICROPROCESSOR
(1BCA5)

Unit-I: (Number System and Data Representation)

Number System: Binary, Octal, Decimal and Hexadecimal Number System and Their Inter Conversion. **Binary Codes:** BCD, Excess3, Parity, Gray, ASCII, EBCDIC Codes and Their Advantages and Disadvantages. **Data Representation:** Positive, Negative, Maximum and Minimum Number Representation (Related to 8 Bit Number), Real Number Representation, Underflow, Overflow, Range and Accuracy. **Binary Arithmetic:** Binary Addition, Decimal Subtraction Using 9's and 10's Complement, Binary Subtraction Using 1's and 2's Complement, Multiplication and Division. Logic Gates: Truth Table, Properties and Symbolic Representation of NOT, AND, OR, NOR, NAND, EX-OR, EX-NOR Gates. NOR and NAND Gates as a Universal Gates.

Unit-II: (Boolean Algebra and Combinational Circuits)

Boolean Algebra: Laws and Identities of Boolean Algebra, Demorgan's Theorem, Use of Boolean Algebra for Simplification of Logic Expression, K-Map for 2, 3, 4 Variables, Simplification of SOP and POS Logic Expression Using K-Map.

Combinational Circuits: Half Adder, Full Adder, Parallel Adder, Half Subtractor, Full Subtractor, 4-Bit Binary Adder Subtractor, Multiplexer, Demultiplexer, Decoder, Encoder, Parity Detector.

Unit-III: (Sequential Circuits and Counters)

Sequential Circuits: Flip-Flops Construction and Working of RSFF, JKRSFF, DFF, TFF, JKFF, and JKMSFF. **Counters:** Construction and Working of Asynchronous, Synchronous, Up-Down Counter, Shift Registers and Their Types, Ring Counter, Johnson Counter with Their Time Diagram.

Unit-IV: (Architecture of 8086 and Assembly Language Programming)

Block Diagram of 8086, Pin Diagram of 8086, Addressing Modes, **Instruction Set:** Data Transfer, Arithmetic, Logical, String Manipulations, Control Transfer, Unconditional Branch, Conditional Branch, Flag, Processor Control. Assembler Directives and Operators, Simple Assembly Programs.

Books:

- 1) Soumitra Mandal, "Digital Electronics", TMH, ISBN 0-07015382-5
- 2) Gothman, "Digital Electronics", Publication PHI.
- 3) Navaneeth, Kale and Gokhale, "Digital and Analogue Technique". ISBN-81-225-0153-2

References:

- 1) B Ram, "Fundamental of Micropocessor and Microcomputer", Dhanpat Rai Pub.
- 2) Liu. Gibson, "Microcomputers Systems" The 8086/8088 Family, ISBN-1-55623-874-6
- 3) Soumitra Mandal, "Microprocessor and Microcontrolloers", TMH, 0-07-132920-X

BCA - I
SEMESTER - I
PAPER VI: DISCRETE MATHEMATICS
(1BCA6)

UNIT I: Fundamental and Mathematics Logic

Fundamental- Sets and Subsets, Operations on Sets, Sequences, Properties of Integers, Matrices.

Logic- Proposition and Logical Operations, Conditional Statements, Methods of Proof, Mathematical Induction.

Mathematical Logic- Statements and Notation, Connectives, Normal Forms, The Theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of the Predicate Calculus.

UNIT II: Counting, Relation and Diagraph, Function

Counting- Permutations, Combinations, The Pigeonhole Principle, Recurrences Relations.

Relations and Digraphs- Product Sets and Partitions, Relations and Digraphs, Paths in Relations and Digraphs, Properties of Relations, Equivalence Relations, Manipulation of Relations, Transitive Closure and Wars Hall's Algorithm.

Functions- Definition and Introduction Function for Computer Science, Permutation Functions.

UNIT III: Graph Theory, Boolean and Tree

Graph Theory- Basic Concept of Graph Theory, Euler Paths and Circuits, Hamiltonian Paths and Circuits.

Other Relations and Structure- Partially Ordered Sets, Lattices, Finite Boolean Algebras, Functions of Boolean Algebras, Boolean Functions As Boolean Polynomials.

Trees- Introduction, Undirected Trees, Minimal Spanning Trees.

UNIT IV: Semi Group and Groups

Semi Group and Groups- Binary Operations Revisited Semi Groups, Products and Quotients of Semi Groups, Groups, Products and Quotients of Groups.

Introduction to Computability Theory- Languages, Finite-State Machines, Semi Groups, Machines and Languages.

Books:

- 1) J.P. Tremblay and R. Manohar, "Discrete Mathematical Structure with Applications to Computer Science", TMH, ISBN- 0-07-463113-6
- 2) Bernard Kolman, Robert C. Busby and Sharon Ross, "Discrete Mathematical Structure", PHI, ISBN- 978-81-203-3689-6

References:

- 1) E. Goodaire , "Discrete Mathematics with Graph theory", PHI,. ISBN--10: 0131679953
- 2) J. K. Sharma, "Discrete Mathematics", McMillan, ISBN-9780230322301

BCA – I
SEMESTER - I
Practical I
(1BCA7)

Practical - I based on IT, Office Automation

A) Information Technology

1. Study of various input devices with troubleshooting.
 - a. To study and installation of keyboard.
 - b. To study and installation of mouse.
2. Study of various output devices.
 - a. To study the installation of printer.
3. To study the installation of multimedia.
4. Study of different operating system.
5. Study of booting process.
6. To study assembling and deassembling the PC.
7. To study and installation of antivirus software
8. Procedure to cleanup Disk, Disk fragmentation
9. Things to know while purchasing the computer.

B) Ms-Word

1. a) Type the Content Heading and then set the Index option using Tab setting. Finally take a print out.

CONTENTS

Chapter	Page No.
Windows	1
Ms-Word	18
Ms-Excel	27
Power-Point.....	98
Ms-Access.....	131

[Chapter names at 1" with left alignment while Page number at 4.5" with right alignment and with leader]

b) Draw a Block diagram of computer system using auto-shapes, and name them using textbox and join each parts using line-style. At the end give the page border to it. Finally take a print out.

c) Type the following set of equation. Finally take a printout.

1. $B^2 - 4AC = 0$
2. H_2SO_4
3. If $(A^2 \geq 0)$

$$4. f(x) = \sum_{i=1}^{i=5} 5 * X^i$$

$$5. k^2 - 4 = 0, \text{ if } b_0 \neq 0$$

$$6. e^{i\theta} + e^{-i\theta} = 2\cos\theta$$

Tip: Use Superscript, Subscript, Insert Symbol and Math equation (Insert → Object → Microsoft Equation)

2. Type the following letter and take printout

ABC
SAI Nagar
Mumbai
☎020-1111111

Dear Sir,

Kindly provide the **rate** of following set of peripherals,

- Computer 🖥 with following configuration
 - Intel® Pentium® Processor T4400 (2.2 Ghz, 1MB L2 Cache, 800 MHz FSB)
 - 250 GB HDD, DVD RW, 35.56cms (14) CSV LED Backlit, 1GB DDR3 RAM
- Floppy disk 🖨 of 1.44 MB of 12 Box
 - Sony
 - Verbatin
- 3-Button mouse 🖱 of following 5 each
 - a) i-ball
 - b) Logitech

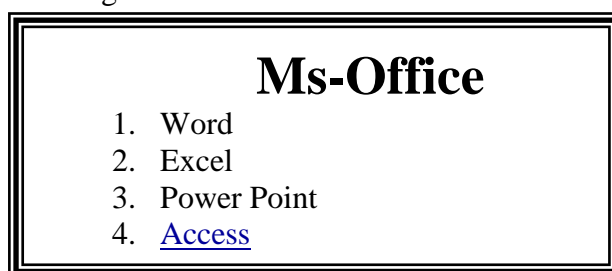
Thanking you,

Date : < Insert System Date >

Your
XYZ

Tip: Use Bullet and Insert symbol option (Wingdings Font), System Date should be inserted through Insert Date and Time Option.

3. Type the following



a) **Ms-Word:** MS-Word is the application software and one of the most powerful word processor in Windows operating system. It is used for formatting of letters or the text. In

simple meaning it is a word processor having various functions for text you may insert different objects like pictures, sound and video or calendar in word file.


- b) **Ms-Excel:** Ms-Excel is a powerful spreadsheet or worksheet application that can use for managing, analyzing and presenting data in tabular format. It also helps to display data in graphical format using charts.
- c) **Ms-Power Point:** Ms-Powerpoint is a powerful tool to create professional looking presentation and slide shows.
- d) **Ms-Access:** Ms-Access is a powerful program to create and manage database.

Perform the following operation,

- i. When user presses on Access it should jump to Access Paragraph within page.
- ii. Similarly create a hyperlink for other option within a page.
- iii. Print it.

Tip: First of all create a book mark for word Ms-Access and then use hyperlink to word Access to link within page for Ms-Access bookmark.

4. Define and write the characteristic of computer and perform following operation,
 - a. Divide the text in two columns
 - b. Insert the picture of computer in the background in each column.
 - c. Insert header with your name
 - d. In footer write name of your college
 - e. Give proper heading for phrase.
 - f. Use Drop Cap for 1st letter of each paragraph
 - g. Define line spacing 1.5 with left margin 1.25” and right margin 0.75”
 - h. Font : Courier New, Font size for heading 14 and for normal text 11
 - i. Finally take a print out.
5. Type the following letter exactly as given below,
Before start of typing, set up page in the following format
 - 1) Page Size : A4 with Landscape Orientation
 - 2) Left Margin: 2” Right Margin: 1” Top Margin: 0.5”



Computer Stream after 12th

- **Science Stream**
 - B.Sc (Computer Science)
 - B.Sc (IT)
 - BCA
 - B.E. (Computer Science)
 - B.E. (Information Technology)
- **Commerce Stream**
 - i. BCCA
 - ii. B.Com (Information Technology)

COMPUTER

[If Computer Picture is not loaded on your computer then simply select one of the pictures loaded in clip-art]

Tip: For writing a text in direction, In Text box write COMPUTER and then select Text Direction option from Format menu. And For background, select textbox and use fill color.

6. Write a letter to publisher for supplying the list of books along with book details. For ex.

To,
 Publisher,
 Das Ganu Prakasan,
 Nagpur.

R/Sir,
 Supply following title of books at the earliest.

Sr.No.	Title	Author	No. of Copies
1	Information System	S.Kishor	10
2	Information Technology	S. Kishor	15
3	Principle of Business Management	S. Kishor	12
4	Financial Accounting	Dr. Kishor Mohrir	13

Thanking you,

Date: < Insert System Date >

Yours

Principal
 (Dr. WWW)

Perform Following option

- 1) Take a printout
- 2) Assume Librarian forget to enter one of the entry of book so, kindly add it between number 3 and 4 say,
 4 Business Economics Gurbir Kaur Khalsa 10
- 3) Replace author name S. Kishor by S.B. Kishor at once.
- 4) Finally print the copy of this document with following settings,
 - Left Margin = 1.75"
 - Right Margin = 1"
 - Top Margin = 1.5"
 - Bottom Margin = 1"

[**Tip:** Formatting option and Table]

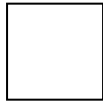
7. Using Mail-Merge write a letter to all selected candidate for their final admission on specific date say (30-June) at XYZ Institute, with necessary documents at 10 AM.
 Name should be highlighted while course and date of commencing class should be underlined

Tip: Assume at least 5 recipient students details (Name, Address, Course for Enroll) are entered in database.

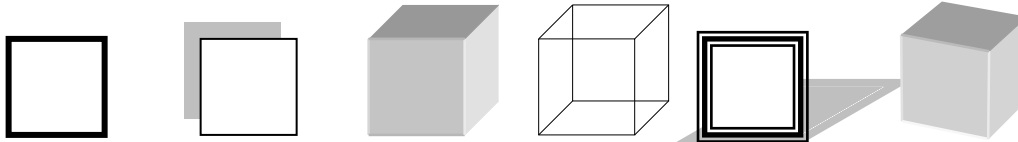
8. Create a document and while saving give a security to open the saved document. Take a screen shot while opening it.

Tip : While Saving, select Security option from Tools Menu option.

9. Draw the following shape using rectangle option found in Drawing Toolbar



And generate following types of box by copying and formatting above box



Tip : Use shadow-style and 3-D style found in Drawing Toolbar

C) MS-Excel

- 1) Prepare following table in a worksheet using MS-Excel.

Name	Basic	DA	HRA	Gross Pay	PF	Net Pay
Rahul	10000					
Sachin	20000					
Nilesh	15000					
Bharti	25000					

Perform following operations:-

- Complete the table using formulas
 - $DA = \text{Basic} * 27 \%$
 - $Hra = \text{Basic} * 10 \%$
 - $PF = \text{Basic} * 12.5 \%$
 - $\text{Gross Pay} = \text{Basic} + DA + HRA$
 - $\text{Net Pay} = \text{Gross Pay} - PF$
- Give the Proper Heading.
- Take the printout in landscape orientation

- 2) Enter following data in MS-Excel worksheet.

Name	Date of joining	Salary	Designation
Rahul	Jan-05	10000	Peon
Sachin	Oct-10	20000	Accountant
Nilesh	Jan-05	15000	Clerk
Bharti	Dec-09	25000	Manager

Perform following operations:-

1. Copy the above data and place in sheet2 and sort the table in the ascending order or date of joining and give proper heading.
2. Copy the above data and place in sheet3 and sort the table in the ascending order or date of joining followed by order of name and give proper heading.
3. Copy all the above data to sheet4 and take printout

3) Prepare following using MS-Excel.

Players	Match 1	Match 2	Match 3	Average	Highest Score	Sum
Sehwag	78	43	91			
Sachin	45	77	62			
Yuvraj	65	80	37			
Dhoni	34	15	46			
Raina	23	75	55			

Perform following:-

- a. Calculate Average and High score of each player using AVERAGE & MAX function
- b. Calculate total score of each match using SUM function.
- c. Sort above records in descending order on the basis of average.
- d. Take the printout in landscape orientation

4) Prepare the Mark sheet of IT subject on the basic of 3 Unit test. Each of 30 Marks and perform following,

1. Calculate total marks, Average and Grade
2. Auto format to the above table.
3. Take the printout

6) Prepare the multiplication using

- 1) Relative cell reference
- 2) Absolute cell reference.

Multiplicand	Multiplier	Product using Relative	Product using Absolute
13	1		
	2		
	3		
	:		
	:		
	10		

7) Create profit and prepare a column chart in MS-EXCEL using the data.

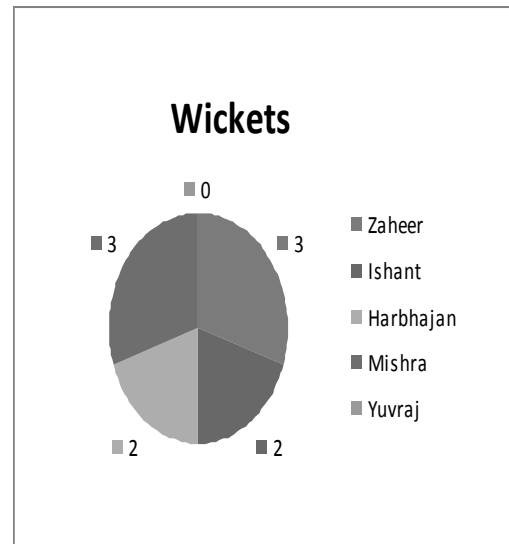
Month	Net Sales	Actual Cost	Profit
Jan. 10	22000	18000	
Feb. 10	245005	9555	
Mar. 10	32450	24850	

Perform following operations:-

- Find the profit
- Give a chart title "Profit Report"
- Take the printout.

8) Draw Pie chart of following excel sheet.

Bowler	Over	Maiden	Runs	Wickets
Zaheer	10	2	22	3
Ishant	10	1	36	2
Harbhajan	10	0	48	2
Mishra	10	0	37	3
Yuvraj	10	0	43	0



D) Ms-Powerpoint

1. Prepare the following slides with the information given below:

- Select the slide of your choice and write about yourself.
- Write about your family members name with relation.
Tip: By using Title and 2 column text
- Using Title Content and text slide insert the picture of your favorite hero with the list of their movies.
- Finally run the slide continuously until ESC key is not pressed.

At last, write the steps that you have perform.

2. Create the following slide.

ICAT PVT LTD	
• COURSES	• FEES STRUCTURE
✓ C	❖ 1500
✓ C++	❖ 2500
✓ VB	❖ 2000
✓ ORACLE	❖ 3000
✓ JAVA	❖ 4000

- Change the bullet style in the first and the second level.
- Change the case of the first level text to upper case and second level text to lower case.(By using Change Case option)
- Change the attribute of the text to: Font : Arial, Font Style : Italics, Size:20
- Justify the text.

3. Select the 10 slides of your choice. Apply the following settings and write the steps you have perform in each options.

- Insert page number in each slide
- Timer should be displayed during execution.
- Change the background color of each slide.
- Set the interval time for each slide to be displayed.
- Use Flash bulb animation in your presentation.
- Select a Color Schemes of your choice.
- Insert Chart in one of your slide.
- Insert a table in your presentation

BCA – I
SEMESTER - I
Practical II
(1BCA8)

A) DIGITAL ELECTRONICS

- 1) To study and Design the characteristics of basic gates (AND,OR,NOT) .
- 2) To study and Design the characteristic of Universal gates (NAND,NOR).
- 3) To study and Design derived gates (Ex-OR,Ex-NOR).
- 4) To study and design the basic gates (AND, OR,NOT) using universal NAND gate.
- 5) To study and design the basic gates (AND,OR, NOT) using universal NOR gate.
- 6) To study and design the derived gates (Ex-OR,Ex-NOR) using universal NAND gate.
- 7) To study and design the derived gates (Ex-OR, Ex-NOR) using universal NOR gate.
- 8) To study and Design NOR gate using NAND gate.
- 9) To study and Design NAND gate using NOR gate.
- 10) To study and Design the R-S FLIP FLOP using NAND gate.
- 11) To study and Design the R-S FLIP FLOP using NOR gate.
- 12) To study and Design the J-K FLIP FLOP.
- 13) To study and Design the J-K-MS FLIP FLOP.
- 14) To study and Design the Half adder .
- 15) To study and Design the Full adder .
- 16) To study and Design the Half subtractor .

B) 8086 Microprocessor

- 1) Write Algorithm, ALP of 8086 μ P & draw flowchart to perform the Addition of two 8 bit numbers .
- 2) Write Algorithm, ALP of 8086 μ P & draw flowchart to perform the Addition of two 16 bit numbers .
- 3) Write Algorithm, ALP of 8086 μ P & draw flowchart to perform the Subtraction of two 8-bit number.
- 4) Write Algorithm, ALP of 8086 μ P & draw the flowchart to perform the Subtraction of the two 16-bit numbers .
- 5) Write Algorithm, ALP of 8086 μ P & draw the flowchart to perform the 1's Complement of number.
- 6) Write Algorithm, ALP of 8086 μ P & draw the flowchart to perform the 2's Complement of number.
- 7) Write Algorithm, ALP of 8086 μ P & draw flowchart to perform the Multiplication of two numbers.
- 8) Write Algorithm, ALP of 8086 μ P & draw flowchart to perform the Division of two numbers.
- 9) Write Algorithm, ALP of 8086 μ P & draw flowchart to Display Addition of array.
- 10) Write Algorithm, ALP of 8086 μ P & draw the flowchart to find the Smallest number from array .
- 11) Write Algorithm, ALP of 8086 μ P & draw the flowchart to find the Largest number from array.

- 12) Write Algorithm, ALP of 8086 μ P & draw the flowchart to Display STRING message
- 13) Write Algorithm, ALP of 8086 μ P & draw the flowchart to arrange given series in ascending order.
- 14) Write Algorithm, ALP of 8086 μ P & draw the flowchart to arrange series descending order.

**BCA - I
SEMESTER - II
PAPER- I: English
(2BCA1)**

**Download the Syllabus
of
B.Sc. I (Semester II)
Compulsory English**

BCA – I
SEMESTER - II
Paper -II: Supplementary English
(2BCA2)

Download the Syllabus
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Supplementary English

**BCA – I
SEMESTER - II
Paper -II: Hindi
(2BCA2)**

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**BCA – I
SEMESTER - II
Paper -II: Marathi
(2BCA2)**

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of
B.Sc. I (Semester II)
Marathi**

BCA - I
SEMESTER - II
PAPER- III: STRUCTURED PROGRAMMING WITH C
(2BCA3)

UNIT I: Introduction to C & Basic Programming Elements

History of 'C', C Character Set, Keywords & Identifiers, Tokens , Basic Structure of 'C' Program, Types of Constants, Data Types, Variables, Type Declaration Instruction, Type Casting, Operators & Expressions, Input & Output Management in 'C'.

UNIT II: Control Statement, Arrays, Storage Class

Control Statements: if, if...else, switch....case, while, do...while, for Loops, Nested Loops, break & continue, exit Statements.

Arrays: Array Definition, One Dimensional Array, Two Dimensional Array, Sorting, Searching, Addition & Multiplication of Two Dimensional Arrays. **Storage Class:** Types of Storage Class: automatic, register, static, external.

UNIT III: Function, String Handling, Structure & Union

Functions: Definition, Library Functions User Defined Functions, Function Prototype, Function Definition, Function Call, Types of User Defined Functions, Arrays & Functions.

String Handling: String Library Functions: strlen, strcat, strcmp, strcpy, strrev.

Structure & Union: Definition of Structure, Declaring Structure, Accessing Structure Elements, Array of Structure, Nesting of Structure. Introduction of Union, Difference between Structure & Union.

UNIT IV: Pointer, File Management in 'C'

Pointer: Introduction to Pointer, Understanding Pointers, Declaring Pointer Variables, Pointer & Function (Call by Value & Call by Reference), Pointer & Arrays, Pointer & Strings, Pointer & Structure, Pointer to Pointer.

File Management in 'C': Introduction, Defining and Opening & Closing File, Input & Output Operations on Files, Random Access to Files, Error Handling During I/O Operations, Command Line Arguments.

Books:

- 1) E. Balagurusamy , “ Programming in ANSI C”,TMH, ISBN- 0-07-068182-1
- 2) B.L. Juneja,”Programming in C”, Cengage Learning, ISBN 81-315-1429-3

References:

- 3) K.R.Venugopal & S.R.Prasad, “ Mastering C ”, ISBN- 0-07-061667-1
- 4) S.Shrivastav, “ C in Depth”, 1st Edition, ISBN 81-7656-107-X

BCA - II
SEMESTER - II
PAPER- IV: DATABASE MANAGEMENT SYSTEM
(2BCA4)

UNIT I- Introduction to DBMS

Database Environment, Data Processing , Traditional and DBMS Environment, Entities, Attributes, Association between Fields, Relationship, Records, Files, Association between Files, Data Abstraction and Integration, Conventional File Processing System, Database System, Classification of DBMS Users, DBMS Facilities, Structure of a DBMS, Database Access, Advantages and Disadvantages of a DBMS, The Three-Level Architecture Proposal for DBMS, Mapping, Data Independence, Data Association.

UNIT II- Data Models, Operations and Maintenance

Data Model: Classification, Approaches to the Relational Model, Hierarchical Model and Network Model with an Example, Entity-Relationship Model. File Organization, Sequential Files, Index-Sequential Files, Direct File, and Secondary Key Retrieval. Database Administrator (DBA), Database Security, Integrity and Control. Problem of Concurrent Access, Resource Locking, Deadlock, Data Recovery.

UNIT–III: Working With MS-Access

Elements of an Access database - Tables, Queries, Forms, Reports and Macros. Introduction to MS-Access, Designing Database, Crating Database using Wizard, Working with Table. **Field Types** - Autonumber, Date/Time, Number, Text, Yes/No, Hyperlink. Creating Tables using Design View and using wizard, Editing Table, Editing Records

UNIT–IV: Query and Form Designing

Query: Filtering Data, Studying different types of Queries, Specifying Criteria in Queries, Filter using multiple criteria. **Forms, Report and Macro:** Procedure to create a Form, Reports and Macros

Books:

- 1) Philip J. Pratt, “Database Management System”, Cengage Learning, ISBN- 81-315-0969-9
- 2) Panneerselvem, “Database Management Systems”, PHI, ISBN- 81-203-2028X.
- 3) Silberschatz, Korth, Sudarshan “Database System Concepts “,BPP, ISBN- 0-07-120413-X.
- 4) Caleste Robinson, “ Access 97”, BPP, 1998, ISBN : 81-7029-928-4

References:

- 1) C.J.Date, A. Kannan, S.Swamynathan,”An Introduction to Database Systems “,8th Edition, Pearson ISBN- 978-81-7758-556-8.
- 2) Sanjay Saxena, “MS-OFFICE- 2007 in a Nutshell”,Vikas Publishing, ISBN- 978-81-259-5036-3.
- 3) Bipin C. Desai,“An Introduction to Database Systems”,Galgotia .

BCA – I
SEMESTER - II
PAPER-V: PC – MAINTENANCE
(2BCA5)

Unit I

Preventive Maintenance: Introduction, Need, Tools, Materials. Procedures : Active Hardware Maintenance, Active Software Maintenance, Passive Maintenance Procedures, Heat and Temperature Control, Dust and Pollution Control, Ventilation Control, EMI Electrostatic Discharge Control, Humidity and Corrosion Control, Shock and Vibration Control, Preventive Maintenance Schedule. BIOS and CMOS, Working with The BIOS Setup Program..

Unit II

History & Study of Different Types of CPUs, Terminology Used with CPU, Data Processing Inside CPU, RAM & ROM, Different Types of ROM, Virtual Memory, Installing and Removing Memory. Video Cards and Monitors, Display Resolution, Features, Video Driver, CRTs Working, LCDs Working, Monitor Resolution, Interfacing, Refresh Rate, Monitor Driver, Adjusting Display Settings in Windows

Unit III

Study of Different Types of Drives, Hard Drive Interfaces- IDE, SCSI, SATA Hard Drive Performance, Installing Hard Drives, Partitioning, Disk Formatting, Common Hard Drive Problems. Installation of Operating System and Software: Installing Video Card: Testing, Plug in the Video Card, Providing Power to the Motherboard, Testing. Installing The CD Rom Drive, Installing Key Board and Mouse, Installing Sound Card, Installing Modem, Installing the Motherboard, Installing the Power Supply, Attaching Add-on Cards, Installing the Drives Testing, Parallel and Serial Port Connection, Front Panel Indicators and Speakers,

Unit IV

Printer Features, Printer Performance, Print Quality, Print Speed, Printer Types, Printer Working, Installation of Printer Driver, Cleaning a Printer, Common Printer Problems. **Formatting:** Formatting PC, Backup of Data Before Formatting, System Restore, Precautions for Formatting, Role of Technician

Trouble Shooting: Introduction-Types of PC Faults-Solid Faults-Intermittent Faults-Developing Strategy. Diagnostic and Repair Tools - Diagnostic Software Tools- Diagnostic Hardware Tools, Advanced Testing Tools-Hand Tools for Service Engineers-Disassembling PC. Troubleshooting Display Problems, Memory Troubleshooting, Power Supply Testing and Problems Troubleshooting. Cleaning and Trouble Shooting of Keyboards, Mouse, Front Panel Indicators and Speakers Troubleshooting.

Books :

1. Fundamentals of Computers - Raja Raman (Prentice Hall of India), ISBN 81-203-2581-8
2. Basics of Computer Hardware - BPB Publication
3. Troubleshooting Your PCs for Dummies 3rd Edition – Dan Gookin, Willey Publishing Inc. ISBN : 9780470230770

BCA - I
SEMESTER - II
PAPER- VI: PRINCIPLES OF OPERATING SYSTEM AND LINUX
(2BCA6)

UNIT -I: Introduction to Operating System

Operating System: Introduction, Purpose, Function and Role of Operating System.

Types of OS: Concepts of Batch, Multi Programmed, Time Sharing, Parallel, Real Time and Distributed.

Computer System Structure: Computer System Operation, I/O Structure, I/O Interrupt, DMA Structure, Storage Structure and Storage Hierarchy.

Hardware Protection: Dual Mode Operation, I/O Memory and CPU Protection, General System Architecture.

UNIT -II: Operating System Structure

System Components: Process, Main Memory, File I/O System, Secondary Storage Management, Networking, Protection System, Command Interpreter System, Operating System Services, System Call.

Process and Job Control: Process and Types of Process, Process State, Operation on Process, File Manipulation Device Management, Information Maintenance, and Communication.

System Structure: Simple Layered Approach, System Administrator.

UNIT - III: Linux

Structure of Linux Operating System, Exploring the Directory Structure, Naming Files and Directories

Shell: Bourne, Korn and C-Shells

File System Commands: ls, Mkdir, Rmdir, Cd, Cat, Mv, Cp, Rm, Ln, Pwd, More
Text Editing with Vi editor

UNIT IV: Shell Scripts

Pipe and Filters: Sort, Grep, Egrep **Permission modes:** Chmod, Chown, Chgrp **Process:** Ps, Kill
Communication, **Shell Scripts:** Variables, Arithmetic in Shell Script, Control Flow Statements, Shell Parameters

Books:

- 1) Andrew S. Tanenbaum, "Modern Operating Systems", 2nd Ed, PHI, ISBN-81-203-0974-X
- 2) Dhananjay M.Dhamdhare, "Operating System".TMH, ISBN 1-25-900558-5
- 3) Jack Tackett, Jr. and Steven Burnett, "Using Linux", PHI, 5th Ed, ISBN-0789716232

References:

- 1) Brain Proffitt, "Red Hat Linux 7",PHI.
- 2) Abraham Silbeschatz, "Operating System Concepts", Bell Labs Peter Baergalvin Replika Press Pvt. Ltd.Delhi, ISBN-9971-51-388-9
- 3) "Teach Linux in 24 hours", SAMS Techmedia, ISBN-81-7635-499-6.

BCA I
SEMESTER - II
Practical I
(2BCA7)

A) Practical on C

- 1) A program to find simple and compound interest for the rate of interest.
- 2) A program to find corresponding temperature in Fahrenheit from a given temperature in Celsius.
- 3) A Program to accept decimal number and display equivalent number in Octal and Hexadecimal.
- 4) A program to swap the contents of two variables.
- 5) Program to accept the distance between two cities in Kilometer and print the distance in meter, feet, inches and centimeter.
- 6) Program to accept the two sides and angle included by these two sides to find area and third side of a Triangle.
- 7) To check a number is even or odd.
- 8) A program for testing leap year.
- 9) A program to find largest among any five number with minimum condition.
- 10) A program to find roots of Quadratic equation ax^2+bx+c .
- 11) Consider the example where we want to print all the prime number between 10 to 100.
- 12) Program to print multiplication Table of a number.
- 13) A program to print number, square and cube of the first 10 natural number.
- 14) A program to find the factorial of a integer number.
- 15) A program to generate and print Fibonacci sequences .
- 16) A program to print first 5 lines of the following pyramid.

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

```

- 18) A program to print first n lines of the following Pyramid.

```

      1
     2 2
    3 3 3
   4 4 4 4
  5 5 5 5 5

```

- 19) A program to find the GCD of two Positive integers by successive division.
- 20) A Program to find the number of Armstrong number between 123 to 425.
- 21) A program to print truth table from $X * Y + Z$.
- 22) A Program to generate a menu driven program using switch statement.
 - 1) Add
 - 2) Edit.
 - 3) Delete.
 - 4) Exit.
- 23) A Program to find sum of two matrices having size $m*n$ and $p*q$.
- 24) A Program to Transport the matrix of size $M*N$.

- 25) A Program to delete an element from list of N number.
- 26) A Program to find sum of each row and column of matrix and also find largest and smallest element in the given matrix.
- 27) A program to count number of characters including uppercase and lowercase letter, digits, punctuations, space and words that are entered in a given string.
- 28) A Program to enter the marks of 5 subjects of 3 students and also find the total marks of each student using structure with array.
- 29) A Program to accept the containing 10 number and pass it to function to print it.
- 30) A program to evaluation following series.

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots + \frac{x^n}{n!}$$
- 31) A program to define and accept the element of structure
- 1) Empno.
 - 2) Name
 - 3) Basic pay and display the same structure along with DA, CCA and gross salary.
 DA and CCA are calculated as follows.
 DA = 91% of basic salary
 CCA = RS 100/- consolidation.
- 32) A program to Sort the string using Pointer.
- 33) A function length () which count the length (number of character in the given string.)
- 34) A function copystr () which will copy the contents of string into another.
- 32) A function concat () with will concatenation the string t to the end of string s.
- 33) A program to simulate DOS TYPE command.
- 34) A program to count number of characters include uppercase and lowercase latter, digits, punctuations, space, words and number of lines in given file.
- 35) A program to create data file "Student.dat" having fields, Rollno, Name and Address
- 35) A program to read and display the contents of data file "Student.dat"

B) MS-ACCESS

- A] Create table Student (Student_no, Student_name, and Course) in MS-ACCESS with the following details and perform following operations.

Student_no	Student_name	Course
101	Sunil	Vb
102	Anshu	Vb.Net
103	Sonam	Tally
104	Shital	Vb.Net

1. Use Column width as best fit.
2. Set Student no as a Primary Key.
3. Insert at least 10 students' records.
4. Display all the students whose name begin with letter 'S'.
5. Display the query view and take out the print out.
6. Add new fields such as Fees, Date_adm ,Date_of_birth, .Address)
7. Add data to above newly fields.
8. Select Student name, Course and Fees from student table.
9. Delete all the students who were admitted on specific date.
10. Update fees to increase it by thrice.
11. Select all the students of VB.NET paying course fees of 4000.
12. Update table by replacing the course name to TALLY wherever the course fees is 3500.

13. Delete the record where Student name is SONAM.
14. Display the student name, student no who was born on '14/6/1996'
15. Replace the Address of student say, ANSHU to PUNE.
16. Remove all the records where number of students is less than 2 for particular course.

B] Create the Tables in which

Stud_per_Detail(Stud_no, Stud_name, Sex, date_of_birth, Address, Ph_no) and
Stud_off_detail(Stud_no, Course, Fees, date_Adm).

1. Select Stud_Name, Address from Stud_Per_Detail and Stud_no, Course, Fees from Stud_off_datail.
2. Create a report view for above query.
3. Append the records of above tables Stud_Per_Detail to Stud_History where Student Date_of_Birth is 14/06/1996.
4. Print the table design view and datasheet view.

C] Create a table Donar(Donar_no, Donar_name, BG, Sex) by using following instruction.

1. Use Columnar Layout.
2. Use Blueprint style.
3. Give the title for Form as Donar Details Form.
4. Enter 5 records.
5. Print the Form view.

BCA I
SEMESTER - II
Practical II
(2BCA8)

A) PC-Maintenance

1. Procedure to Install Memory (Ram)
2. Procedure to Install Monitors & Resolution
3. Procedure to Install Graphics Cards.
4. Procedure to Perform Adjusting Display Setting in Windows

5. Procedure to Perform Installing Video Card.
6. Procedure to Providing Power to the Motherboard.
7. Procedure to Perform Installing CD-ROM Drive , Keyboard & Mouse , Sound Card
8. Procedure to Perform Installing Modem
9. Procedure to Perform Installing Mother Board
10. Procedure to Test Various Hardware Drivers.
11. Procedure to Perform Installing Parallel And Serial Port Connection.
12. Procedure to Perform Installing Front Panel Indicators And Speakers

13. Procedure to Perform Installing Various Types of Printers
14. Procedure to Perform Formatting PC.
15. Procedure to Perform Installing Operating System in PC.
16. Procedure to Perform Transfer Data From One Hard disk to Another Hard disk

17. Procedure to Identify Faults For Using Trouble Shooting
18. Procedure to Identify To Common Printer Problem.
19. Troubleshooting following,
 - a. Computer System Given Continues Beep, Rectify the Problem And Suggest the Solution?
 - b. Solve Problem Insert System Disk And Press Enter Error Message
 - c. When switch on the Computer it Gives Error Message “**Disk Boot Failure**”, Trouble Shoot the Problem And Suggest the Corrective Measure.
 - d. During Booting Process, Machine Shows a Warning Message For Cpu Fan, Solve the Problem.
 - e. When I Switch on the Computer Monitor Displays Nothing Only Its Led is Continuously Blinking, Trouble Shoots the Problem?
 - f. Machines Restart Continuously, Rectify the Problem?
 - g. Audio is Not Available in the System, Solve the Problem?

B) OPERATING SYSTEM AND LINUX

1) Solving Operating System problems using C

- a. A program to find the total base memory
- b. A program to find the total free space memory
- c. a program to find to know boot drive disk
- d. A program to find no. Of drive attach to system
- e. A program to know the various information of disk
- f. A program to know the various status of equipment like number of parallel port, serial and game port is present or not, type of video mode
- g. A program to check math-coprocessor is installed or not
- h. A program to print system date, time and to check whether mouse is installed or not.
- i. A program to know the status of important key on keyboard

2) LINUX

1) Perform the following Directory Commands

a) pwd b) ls c) mkdir d) cd e) rmdir

2) Perform the following File management Commands

a. Cat b) cp c) ln d) rm e) more f) mv

3) A Shell Script to perform various arithmetic operations.

4) A Shell Script that takes two numbers from keyboard and display their average as an output.

5) A Shell Script to display current date, users who have logged in, process status and calendar of the month.