MANGALORE UNIVERSITY
Bachelor of Computer Applications (BCA) Degree Programme
2019-2020 Onwards
I Semester BCA – Blown Up Syllabus

Group I Theory/Week: 4 Hrs Credits:2	BCAC131 Fundamentals of Information Technology	48 hours IA: 20 Exam: 80

	Chapter
UNIT I	**12 Hours**
Computer Basics: Introduction, Characteristics of computers, Evolution of computers, Generations of computers, Classification of computers, the computer system, Application of computers. **Computer Architecture:** Introduction, Central processing unit- ALU, Registers, Control unit, system bus, main memory unit, cache memory, communication between various units of a computer system. **Components inside a computer system** – System case, Power supply, Mother board, BIOS, Ports and Interfaces, Expansion card, Ribbon cable, Memory chips, Processors	Chapter 1- Complete Chapter 2.1, 2.2 ,2.2.1 to 2.2. 6, 2.3, 2.3.1, 2.3.2, 2.7, 2.7.1 to 2.7.8
UNIT II	**12 Hours**
Computer memory and storage: Introduction, memory representation, memory hierarchy, Random access memory, Types of RAM, Read-only memory, Types of ROM, RAM, ROM and CPU interaction. **Secondary Storage**: Types of secondary storage device - Magnetic tape, magnetic disk, Floppy disk, Hard disk, Advantages and disadvantages of magnetic disk, Optical disk, Types- CD,DVD, Blu-ray disk, Advantages and disadvantages of optical disk, Magneto-optical disk, Memory stick,Universal serial bus, Mass storage devices	Chapter 3 (excluding 3.9.3, 3.13.2)
UNIT III	**12 Hours**
Input devices: Introduction, Types of input devices, Keyboard, Mouse, Introduction to Track ball, Joystick light pen, Touch screen and track pad. Speech recognition, digital camera, webcam, flatbed scanner, Optical character recognition, Optical Mark Recognition, Magnetic ink character recognition, Bar code reader. **Output devices**: Types of output, Classification of output devices, Printers – Dot matrix, drum printer, Ink-jet, Laser, Hydra, Plotter, Monitor – CRT, Displaying graphics on CRT, Colour display on CRT, LCD, Differences between LCD and CRT, Other types of monitors, Voice response,Projector, Electronic white board.	Chapter 4 (Excluding working principles of Track ball, Joystick,Light pen, Touch screen and track pad)

UNIT IV	12 Hours
Computer programming languages: Introduction, Developing a program, Program development cycle, Types of programming languages, generation of programming languages, Features of a goodprogramming language. **Computer software:** Introduction, software definition, relationship between software and hardware, software categories, Installing and uninstalling software, software piracy, software terminologies. **Word processing software,Spreadsheet software:** Excel environment,Copying cells using Fill handle, dragging cells, Formulas and functions, Inserting Charts, sorting. **Presentation software**: Introduction,PowerPoint environment, creating a new presentation, working with different views, using masters, adding animation, adding transition, running slides. **Microsoft Access**: Access environment, Database objects.	Chapter 10.1, 10.1.1, 10.1.2, 10.9,10.9.1, 10.10, 10.10.1 to 10.10.5, 10.11 Chapter 11 Chapter 13 Chapter 14.1, 14.2.1, 14.4.5, 14.5, 14.6, 14.7, Chapter 15.1, 15.2.1, 15.3.1, 15.4, 15.5.2, 15.5.7, 15.5.8 Chapter 22.1, 22.4

Text Books:

1. ITL Education Solution Limited, Introduction to Information Technology, Pearson, SecondEdition

Reference Books:

1. A. K. SHARMA, Computer Fundamentals and Programming in C, Universities Press,2nd Edition, 2018
2. Peter Norton, Introduction to Computers, 7th edition, Tata McGraw Hill Publication, 2011
3. Anita Goel, Computer Fundamentals, Pearson Education, 2011

Group I Theory/Week: 4 Hrs Credits:2	**BCAC 132** **Problem Solving Using C**	48 hours IA: 20 Exam: 80
	Chapter	**Pag Nos**
UNIT I		**12 Hours**
Problem Solving techniques: Introduction, Problem solving procedure, **Algorithm:** Steps involved in algorithm development, Algorithms for simple problems: To find largest of three numbers, factorial of a number, check for prime number ,check for palindrome , Count number of odd, even and zeros in a list of integers. **Flowcharts:** Definition, advantages, Symbols used in flow charts. Flowcharts for simple problems mentioned in algorithms. Psuedocode.	Chapter 10 Book-2	275-287
Introduction to C: Overview of C Program, Importance of C Program, Basic structure of a C-program, Execution of C Program.	Chapter 1	1-3,12-14
Constants, Variables and Data types: Character set, C token, Keywords and identifiers, Constants, Variables, data types, Declaration of variables, assigning values to variables, defining symbolic constants.	Chapter 2	22-34 37-38 42-44
UNIT II		**12 Hours**
Operators and Expression: Arithmetic, Relational, logical, assignment, increment and decrement, conditional, bitwise and special operators, evaluation of expressions, Precedence of arithmetic operators, type conversions in expressions, operator precedence and Associativity, built in mathematical functions.	Chapter 3	51-72
Managing Input and Output operations: Reading and writing a character, formatted input and output	Chapter 4	81-101
Decision Making and Branching: Decision making with if statement, simple if statement, the if else statement, nesting of if … else statements, the else if ladder, the switch statement, the **?:** operator, the go to statement.	Chapter 5	111-135
Decision making and looping: The while statement, the do statement, for statement, exit, break, jumps in loops.	Chapter 6	149-170
UNIT III		**12 Hours**
Arrays: Declaration, initialization and access of one-dimensional and two-dimensional arrays. Programs using one- and two-dimensional arrays, sorting and searching arrays.	Chapter 7	189-205
Handling of Strings: Declaring and initializing string variables, reading strings from terminal, writing strings to screen,Arithmetic operations on characters, String Handling functions,table of strings.	Chapter 8	234-254
User-defined functions: Need for user-defined functions, Declaring, defining and calling C functions, return values and their types, Categories of functions: With/without arguments, with/without return values. Nesting of functions.	Chapter 9	265-291
UNIT IV		**12 Hours**
Recursion: Definition, example programs. **Storage classes:** The scope, visibility and lifetime of variables.	Chapter 9	291-292 298-307
Structures and unions: Structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, Structure and functions, structures within structures. Unions.	Chapter 10	320-339

Pointers: Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expression, pointer increments and scale factor, pointers and arrays, pointer and strings, passing pointer variables as function arguments. **File Management:** Create in Read/Write and Append mode, copying file. **The Preprocessor:** Macro substitution, file inclusion.	Chapter 11 Chapter 12 Chapter 14	353-368 371-372 391-398 447-452
Text Books: 1. E. Balagurusamy, Programming in ANSI C, **7th Edition**, Tata McGraw Hill 2. Introduction to Information Technology ITL education solution Ltd, Second Edition		
Reference Books: 1. K.R. Venugopal and Sudeep R. Prasad, Programming with C, 4th Edition, Tata McGraw-Hill Education 2. Yashavant P. Kanetkar, Let Us C, 10thEdition, Tata McGraw Hill, 2010		

Group I Theory/Week:4 Hrs Credits: 2	**BCAC133** **COMPUTER ORGANISATION**	48 Hours IA: 20 Exam: 80
	Chapter	
UNIT I		**12 Hours**
Digital computers and Digital systems: Introduction to Number system, Decimal number, Binary numbers,Octal and Hexadecimal numbers, Number base conversions, Complements, Binary codes, Binary arithmetic ,Addition, Subtraction in the 1's and 2's complements system, Subtraction in the 9's and 10's complement system. Boolean Algebra: Basic definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Venn diagram.	Chapter -1.1, 1.2, 1.3, 1.4, 1.5, 1.6 (Page No:1-22) Chapter-2.1, 2.2, 2.3 (Page No:34-43)	
UNIT II		**12 Hours**
Digital logical gates: Boolean functions, Canonical and Standard forms, other logic operations, Digital logicgates, Universal gate. **Simplification of Boolean functions:** The map method, Two and three variable maps,Four-variable maps, Don't care conditions, Product of sum Simplification, NAND implementation, NORimplementation. Implementation of EX-OR,EX-NOR using NAND and NOR gate.	Chapter-2.4, 2.5, 2.6, 2.7 (Page No:43-57,132,141(Universal gates)) Chapter-3.1, 3.2, 3.3, 3.5, 3.6, 3.8 (Page No:72-80, 83-93, 100-102)	
UNIT III		**12 Hours**
Combinational Logic : Introduction, Design Procedure, Half adder, Full adder, half Subtractor, Full Subtractor, Binary parallel adder, BCD adder. **Combinational logic with MSI and LSI:** Code converter, Exclusive-OR and Equivalence functions. Magnitude comparator, Decoders, Encoders, Multiplexers, Demultiplexers.	Chapter 4.1, 4.2, 4.3, 4.4, 4.5 (Page No:116-128) Chapter 5.3, 5.4, 5.5, 5.6 (Page No:161-176)	
UNIT IV		**12 Hours**
Sequential Logic: Introduction, Flip-flops, RS-FF, D-FF, T-FF, and JK-FF, Triggering of flip-flops, Master slave flip-flop, state table, and state diagram. State equations, Flip Flop excitation tables, Sequential circuits design. **Registers, Counters**: Synchronous Counter Design using RS, JK, D& T flip flops. Ripple counters, Introduction to Registers, Shift registers, Timing sequences, Bidirectional shift register.	Chapter 6.1, 6.2, 6.3, 6.4, 6.6, 6.8 (Page No:202-213, 217-222, 230-232, 243-247) Chapter 7.1, 7.2, 7.3, 7.4 (Page No:256-258, 263-268, 272-274)	
Text Book: 1. M.Morris Mano,**Digital Logic and Computer design,** PHI, 2015		
References Books: 1. Thomas L. Floyd, **Digital Fundamentals**, 10th Edition, Pearson, 2011 2. Thomas C. Bartee, **Digital Computer Fundamentals**, 6th edition, TMH		

<table>
<tr><td>Group-II
Course-1</td><td colspan="2" rowspan="2">Elective - I : Supportive Course
BCACE 136
E1: Internet Basics & HTML</td><td>24 Hours</td></tr>
<tr><td>Theory : 2 hrs/week
Credits : 1</td><td>IA : 10
Exam : 40</td></tr>
<tr><td colspan="3">UNIT I</td><td>12 Hours</td></tr>
<tr><td colspan="2">The Internet : Introduction, Evolution, basic internet terms, Getting connect to internet, Internet applications, Data over the internet
Internet tools: Web browser, Web browser features, Internet Explorer environment, Electronic mail, Email address structure, checking email, sending email, email attachment, How email works, advantages and disadvantages of email,
Search Engines: Searching an internet, refining the search, Instant messaging, Features of messengers.</td><td colspan="2">Book 1</td></tr>
<tr><td colspan="3">UNIT II</td><td>12 Hours</td></tr>
<tr><td colspan="2">Creating Web page using HTML tags: Concepts of HTML, Head & Body Sections, Building HTML documents using various text formatting tags: <H1>...<H6>, <B>,<U>,<I>, <FONT>, <SUP><SUB><P>withalign,
<BLOCKQUOTE><BODY> with attributes bgcolor, background, text, <HR> with size, color, Lists: Ordered, unordered and definition lists, <IMG><A>
Creating tables : <TABLE>,<CAPTION>, <TH><TR><TD> with various attributes
Creating frames<FRAMESET>,<FRAME> tags with attributes-
Creating FORMS with elements <Input> types textbox, radio, checkbox, list box, combo box, text area, submit, button, reset.
Cascading Stylesheets: Inline, embedded and external stylesheets with examples by applying font, background and box properties</td><td colspan="2">Book 2
[All attributes with each tag]</td></tr>
<tr><td colspan="4">Text Books:
1. ITL Education Solution Limited, Introduction to Information Technology, Pearson Education, 2012
2. Steven Holzner, HTML Black book, Dreamtech Publisher, 2010</td></tr>
</table>

Group II Course : 2	Elective - I: Supportive Course BCACE 137 E2: CLOUD COMPUTING	24 Hours
Theory/Week: 2 Hrs Credit:1		IA:10 Exam:40

UNIT I		12 Hours
	Chapter	**Sub Sections**
Introduction to Cloud Computing: History and Evolution of Cloud Computing, Roots of Cloud Computing, Layers and Types of Clouds,Cloud, Desired Features of acloud, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks. **Migrating into a Cloud:** Introduction, Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud, Migration Risks and Mitigation **TheEnterprise Cloud Computing Paradigm**: Relevant Deployment Models for Enterprise Cloud Computing, Adoption and Consumption Strategies, Transition challenges,The Cloud supply chain. **Virtualization:** Introduction to Virtualization, Virtualization technology Overview, Virtual machine provisioning and Manageability,Virtual machine migration services	Chapter 1 Chapter 2 Chapter 4 Chapter 5	1.1 To 1.8 [including all subsections] 2.1,2.2, 2.3 [[including all subsections] 4.2.1 ,4.2.2 ,4.4 4.7 5.1 , 5.2[all sub sections],5.3,5.3.1, 5.4 [all sub sections]

UNIT II		12 Hours
Secure distributed data storage in cloud computing : cloud storage: From LANs to WAN, Moving From LANs to WANs, Existing Commercial Cloud Services, Vulnerabilities in Current Cloud Services, Technologies for data security in cloud computing, Database Outsourcing and Query Integrity Assurance, Data Integrity in Untrustworthy Storage, Web-Application-Based Security Multimedia Data Security Storage. **SLA Management in Cloud** : Introduction , traditional methods of SLO management,types of SLA, Life cycle of SLA, SLA Management in Cloud, Automated Policy Based Management **Performance Prediction for HPC in Cloud:** Grid and Cloud, Grid and Cloud integration,HPC in cloud. **Cloud Best Practices:**Business and technical benefits of cloud Computing, Understanding Amazon Web Services Cloud, CloudBest Practices. **Data Security in Cloud Computing**: Introduction, data Security risk, Cloud computing and identity digital identity and data Security.	Chapter 8 Chapter 16 Chapter 17 Chapter 18 Chapter 23	8.1,8.2,8.2.1,8.2.2,8.2.3,8.3 [all subsections] 16.1 To 16.6 [All subsections] 17.1,17.2,17.3,17.4 [All subsections] 18.1, 18.2.1, 18.2.2, 18.2.3, 18.4 [all subsections] 23.1,23.4, 23.6

Text Book:

Cloud Computing: Principles and Paradigms, RajkumarBuyya, James Broberg, Andrzej M. Goscinski, John Wiley and Sons Publications

Reference Books:

1. Cloud Computing Black Book : KailashJayaswal, JaganathKallakurchi ,Donald &Dr.Deven Shah
2. Cloud Computing, A Practical Approach by Toby Velte (Author), AnthonyVenlte

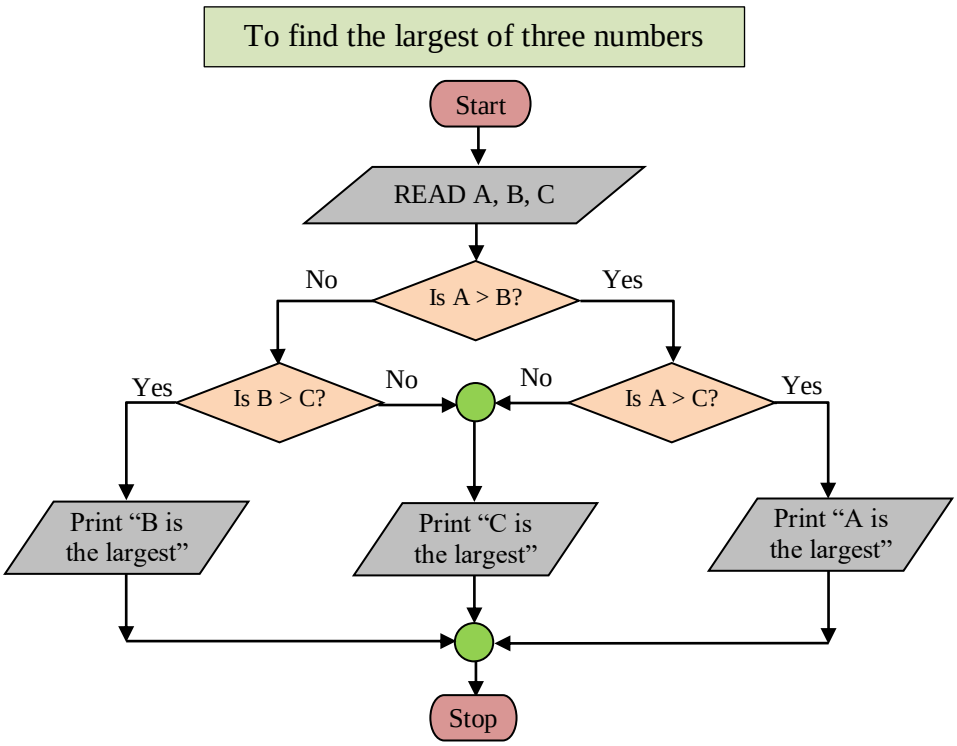
Practical-I	**BCAP 134** **Office Automation Lab**	**48 Hrs**
Practical/Week: 4 Hrs **Credits: 2**	**Exercises in MS Office Package**	**I.A.: 20** **Exam: 80**

Part A: MS Word Exercises: 18 Marks

1. Prepare a document including following features.
   a) inserting picture
   b) bulleting and numbering
   c) formatting (size, bold, underline, italic, superscript, subscript, colour, etc.)
   d) border and shading,
   e) paragraph and line alignment

2. Paper cutting with word art, drop cap, columns, inserting textbox, symbols, equation of any mathematical series, background color, header and footer.

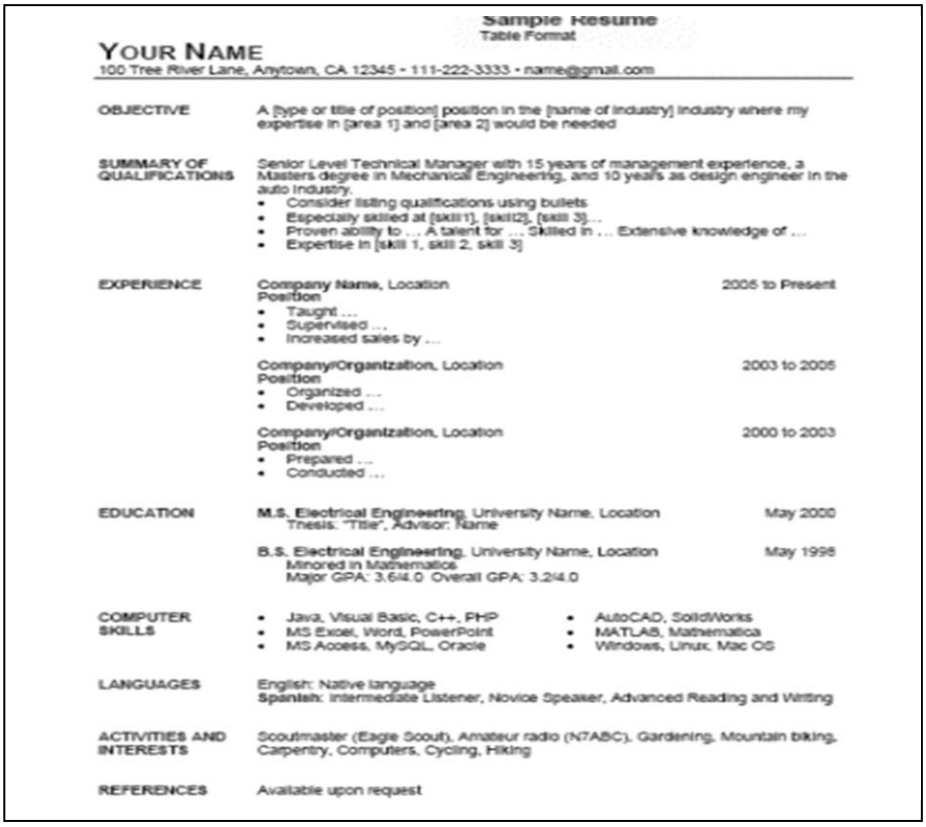
3. Draw the following using various drawing tools (Maintain the format same but matter can be changed).



4. Prepare a document with table to insert Rollno, Name, Class, Marks in three subjects of ten students. Calculate total marks and average. Also find the highest total marks and also the maximum and minimum marks secured in each subject.

5. Prepare interview call letter for five candidates describing about the company and instructions about the interview. Use Mail merge feature.

6. Prepare a resume with the following details:
   Name, Address, objective, summary of qualifications, experience, education, computer skills, languages, activities and hobbies and references as in the given format.



Sample Resume
Table Format

YOUR NAME
100 Tree River Lane, Anytown, CA 12345 - 111-222-3333 - name@gmail.com

OBJECTIVE
A [type or title of position] position in the [name of industry] industry where my expertise in [area 1] and [area 2] would be needed

SUMMARY OF QUALIFICATIONS
Senior Level Technical Manager with 15 years of management experience, a Masters degree in Mechanical Engineering, and 10 years as design engineer in the auto industry.
- Consider listing qualifications using bullets
- Especially skilled at [skill 1], [skill2], [skill 3]....
- Proven ability to ... A talent for ... Skilled in ... Extensive knowledge of ...
- Expertise in [skill 1, skill 2, skill 3]

EXPERIENCE
Company Name, Location — 2005 to Present
Position
- Taught ...
- Supervised ...
- Increased sales by ...

Company/Organization, Location — 2003 to 2005
Position
- Organized ...
- Developed ...

Company/Organization, Location — 2000 to 2003
Position
- Prepared ...
- Conducted ...

EDUCATION
M.S. Electrical Engineering, University Name, Location — May 2000
Thesis: "Title", Advisor: Name

B.S. Electrical Engineering, University Name, Location — May 1998
Minored in Mathematics
Major GPA: 3.6/4.0 Overall GPA: 3.2/4.0

COMPUTER SKILLS
- Java, Visual Basic, C++, PHP
- MS Excel, Word, PowerPoint
- MS Access, MySQL, Oracle
- AutoCAD, SolidWorks
- MATLAB, Mathematica
- Windows, Linux, Mac OS

LANGUAGES
English: Native language
Spanish: Intermediate Listener, Novice Speaker, Advanced Reading and Writing

ACTIVITIES AND INTERESTS
Scoutmaster (Eagle Scout), Amateur radio (N7ABC), Gardening, Mountain biking, Carpentry, Computers, Cycling, Hiking

REFERENCES
Available upon request

Part B: MS Excel Exercises: 22 Marks

(Note: Give proper titles, column headings for the worksheet. Insert 10 records for each exercise in such a way to get the result for all the conditions. Format the numbers appropriately wherever needed).

1. Create a worksheet to maintain student information such *as RollNo, Name, Class, Marks in three subjects* of 10 students. Calculate total marks, average and grade. Find grade for Distinction, First class, Second class, Pass and Fail using normally used conditions.
   - Using custom sort, sort the data according to class: - Distinction first, FirstcClass next, and so on. Within each class, average marks should be in descending order.
   - Also draw the Column Chart showing the RollNo versus Average scored.

   (Note: Worksheet creation:6 marks, calculations:6 marks, sorting: 3marks, chart: 5marks, other formatting: 2 marks)

2. Prepare a worksheet to store details of Electricity consumed by customers. Details are Customer No, Customer Name, Meter No, Previous meter reading, Current meter reading of 10 customers. Calculate total number of units consumed and total amount to be paid by each consumer using following conditions:

   If unit consumed is up to 30, charge is 100.
   31 to 100 units, 4.70 per unit
   101 to 200 units, 6.25 per unit
   Above 200 units, 7.30 per unit.

   - Use Data validation to see that current reading is more than previous reading.
   - Arrange the records in the alphabetic order of names.
   - Filter the records whose bill amount is more than Rs.1500.

   (Note: Worksheet creation:6 marks, Data validation: 3 marks, calculations: 6 marks, sorting: 2 marks, Filtering: 3 marks, other formatting: 2 marks)

3. Create Employee database having EmpNo, EmpName, DOJ, Department, Ddesignation and Basic Pay of 8 employees. Calculate DA, HRA, Gross Pay, Profession Tax, Net Pay, Provident Fund as per the rule :

   DA = 30% of basic pay
   HRA = 10% of basic pay if basic pay is less than 25000, 15% of basic pay otherwise.
   Gross =DA +HRA+ Basic pay
   Provident fund =12% of Basic pay or Rs.2000, whichever is less.
   Profession Tax= Rs.100 if Gross pay is less than 10000, Rs.200 otherwise.
   NetPay = Gross - (Professional tax + Provident Fund)

   - Prepare individual pay slips of (at least 3) employees in another work sheet
   - Using Pivot table, display the number of employees in each department and represent it using **Pie** chart.

   (Note: Worksheet creation: 5 marks, calculations:6 marks, Individual slip: 3 marks, Pivot table: 3 marks, Chart: 3 marks, other formatting: 2 marks)

4. Create a table COMMISSION containing the percentage of commission to be given tosalesmen in different zones as follows:

Zone	Percentage
South	10
North	12.5
East	14
West	13

   Create another table SALES in the same worksheet to store salesman name, zone name, place, name of the item sold, rate per unit, quantity sold. Calculate total sales amount of each salesman. Referring the COMMISSION table, write the formula to compute the commission to be given.(Hint: Use if function and absolute cell addresses)
   Using advanced filtering show the result in other parts of the worksheet.

   - Show the records of various zones separately.
   - Show the records of only East and West zones.
   - Display the details of the items sold more than 50, in South or North zones.

   (Note: Worksheet creation:6 marks, calculations: 5 marks, filtering:9marks, other formatting: 2marks)

Part C

a) MS Power Point Exercises: 10 Marks

(4 slides: 6 marks, Applying various features: 4marks)

Prepare a power point presentation with at least four slides(in each exercise) and picture, chart and other contents for the following. Apply various transition and animations. Slides should be moved automatically and repeatedly.

Exercise No. 1:About your college.

Exercise No. 2:Any visiting place of your choice.

Exercise No. 3: A simple quiz program. Use diagrams. Use hyperlinks to move to another slide in the presentation to display the result and correct answer. Use at least four questions.

b) MS Access Exercises: 15 marks

(Note: Insert ten records for each exercise in such a way to get the result for all the queries. Use Access queries)

1. Create a **student table** with the following details:
   StudentNo (Primary key), Name, Address, Class, Marks1, Marks2, Marks3. Find the total and average marks of all the students.
   Execute the following queries:
   a) List the records belonging to I BCA Class
   b) Extract the records where average is greater than 50
   c) Extract the records where total is in between 200 and 275
   (Note: Table creation:4 marks, inserting records: 2 marks, query results:6 marks, update queries: 3 marks)

2. Create a table ITEM with the following details:
   ItemNo (Primary key), Name, Brand, Quantity purchased, Quantity sold and rate per unit. Find the total items remaining in stock for each item. Also compute total Amount of each item by the product of rate and quantity remained.
   Using the above table, execute the following queries:
   a) List the items with quantity purchased more than 100 and rate per unit is Rs.75.
   b) Extract the records of a particular item (Same item name can be there with various brands).
   c) Extract records with total items in stock is less than 50 or quantity sold more than 500.
   (Note: Table creation:4 marks, inserting records: 2 marks, query results:6 marks,update queries: 3 marks)

3. Create Employee database having employee number, employee name, doj, designation andbasic pay. Calculate DA,HRA, Gross pay, Income tax, Net pay,Provident fund as per the rule.
   DA= 10% of basic pay
   HRA: 10% of basic pay if basic pay is less than 25000, 25% of basic pay otherwise.
   Gross =DA +HRA+ Basic pay
   Provident fund =12% of Basic pay
   Professional Tax is Rs.100 if Gross salary is less than 10000,Rs.200 otherwise.
   NetPay = Gross - (Professional tax + Provident Fund)
   Using employee table,execute the following queries:
   a) Select employees who are drawing gross salary not more than 5000.
   b) Select employees who joined after 1st July 2010.
   (Note: Table creation:4 marks, inserting records: 2 marks, query results:4 marks, update queries: 5 marks)

Scheme of Examination

S. No.	Details			Marks
1.	Part A	MS Word		18
2.	Part B	MS Excel		22
3.	Part C	a)	MS Power Point	10
		b)	MS Access	15
4.	Class Records			10
5.	Viva-Voce			5
Total Marks				**80**

Practical-II	BCAP 135 C Programming Lab	48 Hrs
Practical/Week: 4 Hrs Credits: 2	Exercises in C Language	I.A.: 20 Exam: 80

Part A:18 Marks

1. Write a program to find the greatest of three numbers by using **nested if** statement.
2. Write a program to reverse a number and find the sum of individual digits. Also check for palindrome.
3. Write a program to generate Fibonacci numbers between two entered numbers.
4. Write a program using **switch** statement to find the Professional Tax for an employee based on the gross salary at following rates:

   Gross<20000: No tax, 20000 ≤ Gross< 30000: 3%

   30000 ≤Gross < 50000: 5%, Gross≥ 50000: 8%
5. Write a program to generate first n prime numbers.
6. Write a program to find the largest and smallest elementsvwith their position in a one-dimensional array.

Part B: 22 Marks

1. Write a program to input n numbers and sort it in ascending order using bubble sort.
2. Write a program to search a number in a list with duplicate elements using linear search technique. If present, print its position(s).
3. Write a program to find the transpose of the matrix. Also check for symmetry.
4. Write a program to find the sum of the following series upto n terms.

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots$$

   Use recursive function to find factorial.

   (**Note**: Input x in degrees and convert into radians by multiplying with π/180).
5. Write a program to count the numbers of words, vowels, digits and spaces in a given sentence. (Words may be separated by multiple spaces).
6. Write a program to add two matrices using pointers.

Part C: 25 Marks

1. Write a program to enter the information of n students like name, register number, marks in three subjects into array of structures and display total, average and grade for each student. Display the records in a neat tabular form.
2. Write a program to input Name of the branches, Total sales of company into an array of structures, Display the Branch Name and Sales of branch with highest sales. Assume many branches can have same highest sales.
3. Write a menu driven program to
   a) create a text file
   b) append the contents of a text file to another existing file by accepting filenames
   c) display the content of entered filename
   d) exit

   Create two text files during the execution of the program. Display their contents. Perform Appending. Display the contents again. Always check for the existence of the input files.

4. Write a program to create a data file ITEM to input item information ItemNo, Name, Stock and Rate/unit. Read the table ITEM and copy only those records where stock is more than 100 to another file STOCK100. Display the contents of both the files separately. Also print total number of records in each file.

Scheme of Examination

S. No.	Details			Marks	Total
1.	Part A	i.	Problem solving and coding	8	18
		ii.	Compiling and debugging	6	
		iii.	Execution and testing	4	
2.	Part B	i.	Problem solving and coding	10	22
		ii.	Compiling and debugging	7	
		iii.	Execution and testing	5	
3.	Part C	i.	Problem solving and coding	11	25
		ii.	Compiling and debugging	8	
		iii.	Execution and testing	6	
4.	Class Records				10
5.	Viva-Voce				5
Total Marks					**80**