MANGALORE UNIVERSITY

State Education Policy – 2024
[SEP-2024]

BLOWN UP SYLLABUS AND PRACTICAL LIST

FOR

I SEMESTER BCA
BCA-ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Semester I								
Sl. No	**Course Code**	**Title of the Cours*e***	**Category of Courses**	**Teaching Hours per Week**	**SEE**	**IA**	**Total Marks**	**Credits**
1	**BCA – AIML-1.1**	**Fundamentals of Information Technology**	**Core**	**4**	**80**	**20**	**100**	**3**
2	**BCA - AIML -1.2**	**Problem Solving using C**	**Core**	**4**	**80**	**20**	**100**	**3**
3	**BCA - AIML -1.3**	**Computational Mathematics**	**Core**	**5**	**80**	**20**	**100**	**5**
4	**BCA- AIML -1.4**	**Fundamentals of Information Technology Lab**	**Practical**	**4**	**40**	**10**	**50**	**2**
5	**BCA - AIML –1.5**	**C Programming Lab**	**Practical**	**4**	**40**	**10**	**50**	**2**

Program Name	**BCA-AIML**	Semester	**I**
Course Title	**Fundamentals of Information Technology(Theory)**		
Course Code:	**BCA- AIML -1.1**	No.of Credits	**03**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Topics	**Book**	**Chapter/Page No./ Section No.**
UNIT I		
Computer Basics: Introduction, Characteristics computers, Evolution computers, Generation of computers, Classification of computers, the computer system, Application of computers.	Book 1	Chapter 1 (1.1-1.6)
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 – Power supply, Mother board, BIOS, Ports and Interfaces, Expansion card, Ribbon cable, Memory chips, Processors	Book 1	Chapter 2 (2.1-2.3,2.7)
UNIT II		

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.	Book 1	Chapter 3 : 3.1-3.5 (Page no 66-73)
Secondary Storage: Types of secondary storage device - Magnetic tape, magnetic disk, Floppy disk, Hard disk, Advantages and disadvantages of magnetic disk	Book 1	Chapter 3: 3.6,3.7,3.8, 3.9
Computer Software : Introduction, definition of software categories of software, system software, Operating Systems, device drivers ,language translators, System Utility, Application Software	Book 1	Chapter 11:11.1 -11.3
Operating Systems: Introduction, operating system definition, Types of Operating Systems. Functions of an operating System,	Book 1	Chapter 5:5.1 ,5.2,5.4,5.5
UNIT III		
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, flat bed scanner.	Book 1	Chapter 4: 4.1,4.2(only device characteristics)
Output devices: Types of output, Classification of output devices, Printers- Dot matrix, drum printer, Ink jet, Laser, Hydra, Plotter and its	Book 1	4.3,4.3.1,4.3.2(introduction and characteristics),4.3.4

types, Monitor- CRT, Displaying graphics on CRT, Colour display on CRT,LCD, Differences between LCD and CRT **Computer programming languages:** Introduction, Developing a program, Program development cycle, Types of programming languages, generation of programming languages, Features of a good programming language.	Book 1	Chapter 10: 10.1,10.9,10.9.1,10.10,10.11
	UNIT IV	
Word processing software: Word environment, using files and folders ,working with text, working with tables ,checking spelling and grammar, printing document **Spreadsheet software:** Excel environment, formatting and Copying formulas, working with rows and columns additional features and charting **Presentation software:** Introduction, PowerPoint environment, creating a new presentation, working with different views, using masters, adding animation, adding transition. **Microsoft Access:**Access environment, Database objects**.**		**MATERIALS SUPPLIED BY BOS**
Text Book:		

1. ITL Education Solution Limited, Introduction to Information Technology, Pearson- Second Edition.

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, 201

Program Name	**BCA -AIML**	Semester	**I**
Course Title	**Problem Solving using C(Theory)**		
Course Code:	**BCA –AIML- 1.2**	No.of Credits	**03**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Topics	**Book**	**Chapter/Page No./ Section No.**
UNIT I		
Computer Programming and Languages – Introduction, Algorithm, Flowchart, Program Control Structures, Programming Paradigms, Programming Languages.	Book 2	10.1, 10.2,10.3, 10.6 10.7, 10.9
Introduction to C: Overview of C Program, Importance of C Program, Basic structure of a C-program, Programming style, Execution of C Program.	Book 1	Chapter 1
Constants, Variables & Data types: Character set, C token, Keywords & identifiers, Constants, Variables, data types, Declaration of variables, Declaration of storage class, Assigning values to variables, defining symbolic constants.	Book 1	Chapter 2
UNIT II		

Operators and Expression: Arithmetic, Relational, logical, assignment, increment & decrement, conditional, bit wise & special operators, Arithmetic expressions, Evaluation of expressions, Precedence of arithmetic operators, type conversions in expressions, operator precedence andassociativity, built in mathematical functions.	Book 1	Chapter 3
Managing Input and Output operations: Reading a character, Writing a Character, formatted input-inputting integer numbers, inputting real numbers, inputting character strings, reading mixed-data types, formatted output-output of integer numbers, output of real numbers, printing of mixed data types.	Book 1	Chapter 4
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.	Book 1	Chapter 5
UNIT III		
Decision making and looping: The while statement, the do statement, for statement, jumps in loops	Book 1	Chapter 6
Arrays: Introduction,one dimensional arrays, declaration and initialization of one dimensional arrays, two dimensional arrays, initializing two dimensional arrays.	Book 1	Chapter 7
Handling of Strings: Declaring & initializing string variables, reading strings from terminal, writing strings to screen, Arithmetic operations on characters, Putting strings together, Comparison of two strings, String Handling functions,table of strings.	Book 1	Chapter 8
User defined functions: Need for user defined functions, Declaring, defining and calling functions return values and their types, Function calls, Function declaration, Categories of functions:	Book 1	Chapter 9

With/without arguments, with/without return values. Recursive functions. The scope, visibility and lifetime of variables.		
	UNIT IV	
Structures and union: Defining a structure, Declaring structure variables, structure initialization, copying and comparing structure variables, operations on individual members, arrays of structures, arrays within structures, Unions.	Book 1	Chapter 10
Pointers: Understanding pointers, initialization of pointer variables, accessing a variable through its pointer, chain of pointers, pointer expressions, pointer increments and scale factor, pointers and arrays.	Book 1	Chapter 11
File Management- Defining and Opening a file, closing a file, Input/Output operations on files, Error handling during I/O operations	Book 1	Chapter 12

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. Deitel, P., &Deitel, H. (2012). **C How to Program** (7th ed.). Prentice Hall.
2. Kanetkar, Y. (2016). **Let Us C** (15th ed.). BPB Publications.
3. Kernighan, B. W., & Ritchie, D. M. (1988). **The C Programming Language** (2nd ed.). Prentice Hall.
4. Schildt, H. (2017). **C: The Complete Reference** (4th ed.). McGraw Hill Education.
5. Kochan, S. G. (2014). **Programming in C** (4th ed.). Addison-Wesley.
6. K.R. Venugopal, Sudeep R Prasad, **Programming with C**, 4th Edition, Tata McGraw-Hill Education.

Program Name	**BCA -AIML**	Semester	**I**
Course Title	**Computational Mathematics(Theory)**		
Course Code:	**BCA –AIML- 1.3**	No.of Credits	**05**
Contact hours	**5 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Unit	**Description**	Text Book	Sections/Subsections
1	**Logarithms:** Introduction, Laws of operations (Statements only), Illustrations 1(a), (P 193-195),2,3(i,ii,iii,v) Change of Base rule (statement only), Examples 2,3,4,5,7, 14 (P 195, 197-199, 204), 19(a) (P 206), Exercise(I) 1, 2, 3 5(a),8(a((i ,ii)) 11(a), (b), C(i), 17(a)(i, ii)	Book 1	7.0 7.1
	Binomial Theorem: Statement only (P 334), Example 1, 2(P 336), 5 Exercise (I)(i, ii) 2 (i) & (ii) (P 338) Positions of Terms Examples 5 (P 337), 7(a) & 7 (b) (P 339) Exercise (II)-6(i),7 (P 350)	Book 1	10.1 10.2
	Analytical Geometry : Introduction, Directed Line, Quadrants, Example 1 (P 555) , Coordinates of the midpoints, (statement and example) (P 556), Distance between two points (Only formula no proof), Section Formula, External Division, Coordinates of Centroid, Area of a Triangle (Only statements), Examples 2(a) & (b) (P 557), 3, 4, 7,11(P 558, 559, 562,565) Exercise I-1(i ,ii), 3,5, 9(i), 15 (a) and (b), 16(a) and (b) 21(a), 24 (i) & (ii)	Book 1	15.0 15.1 15.2 15.4 15.5 15.6 15.7 15.8
	Straight Line: Slope or gradient of a straight line (formula Only), Different forms of equations of straight line (Statements- I, V, VII, IX), General equation of a straight Line (Statement Only), Example 18(P 579), Condition of Parallelism and perpendicularism (P 585, Only formula), Example 29(587) Exercise 2 (a, b), 3(b) (i), (ii) and (iii) (P 592), 13 (i, ii)	Book 1	15.9 15.13 15.14 15.15 15.16 15.22 15.23

	Circle: The equation of a Circle (only Formula, I and II), Illustration (P 597), General Equation of the Circle (Statement only), Finding centre and radius Example (37,39) (P 601) Exercise (III): 5(i) (P 612), 6(a) Equation of tangent and normal (Statement only, P 605 and 606) Example 50	Book 1	15.24 15.25 15.26
2	**Matrix Algebra** Introduction, definition, types of matrices, Illustration, scalar multiplication of matrices, Illustrations, equality of matrices, Illustrations 1,2,3 Exercise (I) 1,2,3 matrix operations, Addition and subtraction, Example 1(P 803), Multiplication, Example 2,3,4,12,13 Exercise(II):1(i,ii,iii),2, 13 Transpose of a matrix, Example: 15, symmetric matrix, skew symmetric and orthogonal matrix (P 822,823), Exercise (III): 1(a), 2, 3 Determinants of a square matrix, determinants of order two, Example (P 824),17 , Determinant of order three, expansion of the determinants, minors of a matrix, co-factors of a matrix, Example:23, 24,25 Exercise (VI): 1,3 Adjoint of a square matrix, Rank of a matrix. Illustrations:1,2,3 Exercise (VIII):4(i, ii) echelon form of a matrix (Statement and example only), normal form of a matrix (only statement), equivalence of matrices (only statement) **Inverse of a matrix** (using adjoint matrices –cofactor method), Example:27 Exercise (VII): 1, 2,4 **Cramer's rule**, Example 16 **Arithmetic and Geometric Progressions:** **Arithmetic progression:** Definition, formula for nth term, sum to n terms, Arithmetic mean, Example 1, 2, 3,4,7,8,10,15 Exercise 1: 2, 4, 7,9 **Geometric progression:** Definition, formula for nth term, sum to n terms, geometric mean, Example 1,2, 7,18,26,27,30 Exercise: 2,17,19	Book 1 Book 3 Book 1 Book 1 Book 2	20.1, 20.2 20.3, 20.4 20.5, 20.6 20.8, 20.10 20.11, 20.12 20.14 20.18 20.19 20.20 20.21 20.25 Page-371,373,375 20.22 20.13, 20.15(problem) 3.1-3.4 3.26-3.28
3	**Mathematical logic**: Introduction, statements, Connectives, negation, conjunction, disjunction, statement formulas and truth tables, Examples 1,2,3, Exercises 1-2.4(1,2,3,4), conditional and Biconditional statements (Exclude program Pg. No19), Examples	Book 3	1-1, 1-2 1.2.1 to 1.2.11

	(1,2,3,4,5), Exercises 1-2.6(2,4), tautologies, Exercise 1-2.8-1, equivalence of formulas, Example 1, duality law, Example 1 Tautological Implications, Exercise 1-2.11(1,2,5) Predicates and Quantifiers (Exclude all theorems with proofs and algorithms in each section) **Sets:** Definition, notation, inclusion and equality of sets, the power set, Exercise 2-1.3(1,2,4), (Pg No 104-111), (exclude definition 2-1.7), Operations on sets,(All the definitions with no proof), Example 1, 3, 5, Exercise 2-1.4(2,7), (Pg .No 111-115), Venn diagram, Exercise2-1.5-2,ordered pairs, and n-tuples, Cartesian product, example 1,2, exercise 2-1-3, 4(Pg No 122-126) **Relations:** Introduction, Example 1, Exercise 2-3,1-1(Pg No 148-151,153), properties of a binary relation in a set, Exercise 2-3.2-5, Example 1, 2,3, Relation matrix and graph of a relation, (Pg No 154-159) equivalence relations, Examples 1,2, (Pg No 164-165), compatibility relations, composition of Binary relation, Examples 1,2,3,4(Pg No 176-180) **Functions:** Definition and introduction (Except definition 2-4.2), exercises 2-4.1-4,5, types of functions, composition of functions, Example 1,2 inverse functions, Examples 1,2, Exercise2-4.3-4(Pg No 192-205),(Only theorem statements (no proof))	Book 3 Book 3 Book 3	(Exclude 1-2.5, 1-2.7) 1-5.1, 1-5.2 2-1 2-1.1 to 2-1.9 (Exclude 2-1.6, 2-1.7) 2.3, 2-3.1, 2-3.2, 2-3.3, 2-3.5(exclude definition 2-3.10, 2-3.12, 2-3.15, algorithm and theorem 2-3.1, 2-3.2) 2-4.1 to 2-4.3
	Counting: Basics of counting,(Product Rule, Sum Rule, inclusion and exclusion principle), Example 1 to 5, 12,13,18,19, Exercise-1,2,3(Pg No 385-393, 396), Pigeonhole principle,(Only Theorem 1 statement), Example 1,2,3,(Page No 99-399-400) , Permutation and combination, Example 1,2,3,4,5,10,12,13, Exercise-1,4,(only theorem and corollary statements- no proof),(Pg. No 407-413), Generalized Permutations and Combinations, Examples 1,2,3,4, Theorem 1 and 2(only statements)(page No 423 to 425),(only theorem and corollary statements – no	Book **4**	6-1 6-2 6-3 6-5 6.6

	proof) generating permutation and combination, Example 1 to 5 (Page No 434-438), inclusion and exclusion Example 1,2,3(Pg No 552-554) **Graphs**: Graphs and Graph models(Only definitions with example figures, (Page No 641-655), Graph Terminology and Special Types of Graphs, Examples 1,3,4,5,6,7(Page No 651-655)(only theorem statements, no proof)(Except Bipartite Graphs, Some Applications of Special Types of Graphs),Example 18,19,(Page No 663-664) Representing Graphs and Graph Isomorphism, Examples 1,2,3,4,5,6,7,8(Page No 668-672)Exercise(Page No 675-)1,3,5,7,10,13 Connectivity, Page No 678-681, 685-686), Definitions 1,2,3,4,5,Example 1,4,10(Except all theorems and proof of this section) Euler and Hamilton Paths, Definition 1,2,Example1,2,5(Page No 693-699)(except necessary and sufficient conditions for Euler circuits and paths, exclude all theorems and proof of this section), Shortest-Path, Problems (Page No 709-720) Planar Graphs- Introduction, all examples and Applications (Page No 718-720) Graph Colouring b, Definitions 1,2, Theorems 1(No proof), Example 1, (Page No 727-729), Exercise 1,3,5,7,(Page No 732) **Trees**: Directed tree, leaf node, branch node, ordered tree, degree of a node, forest, descendent, m-ary tree, conversion of directed tree into a binary tree (Page No 494-500) **Applications of Discrete Mathematics in Modelling Computation:** Language and Grammars – Introduction, Phrase-Structured, Types, Derivation Trees; Finite State Machines with Output – Introduction, Finite State Machines, Types; Finite State Machines without Output - Introduction, Set of Strings, Finite State Automata, Language Recognition by FSM; Language Recognition – Introduction; Turing Machine – Introduction, Definition	Book **4** Book 3 Book 4	10.1 to 10.8 5.1.4 Chapter 13

Text Books:

1. D C Sancheti and V K Kapoor, Business Mathematics, Sultan Chand & Sons, 2011
2. P.R. Vittal, business Mathematics and Statistics, Margham Publications, Chennai
3. J P Trembley and R Manohar, Discrete Mathematical Structures, McGraw Hill Education Private Limited, New Delhi.
4. Kenneth H Rosen, Discrete Mathematics and Its Applications., Seventh edition, 2012

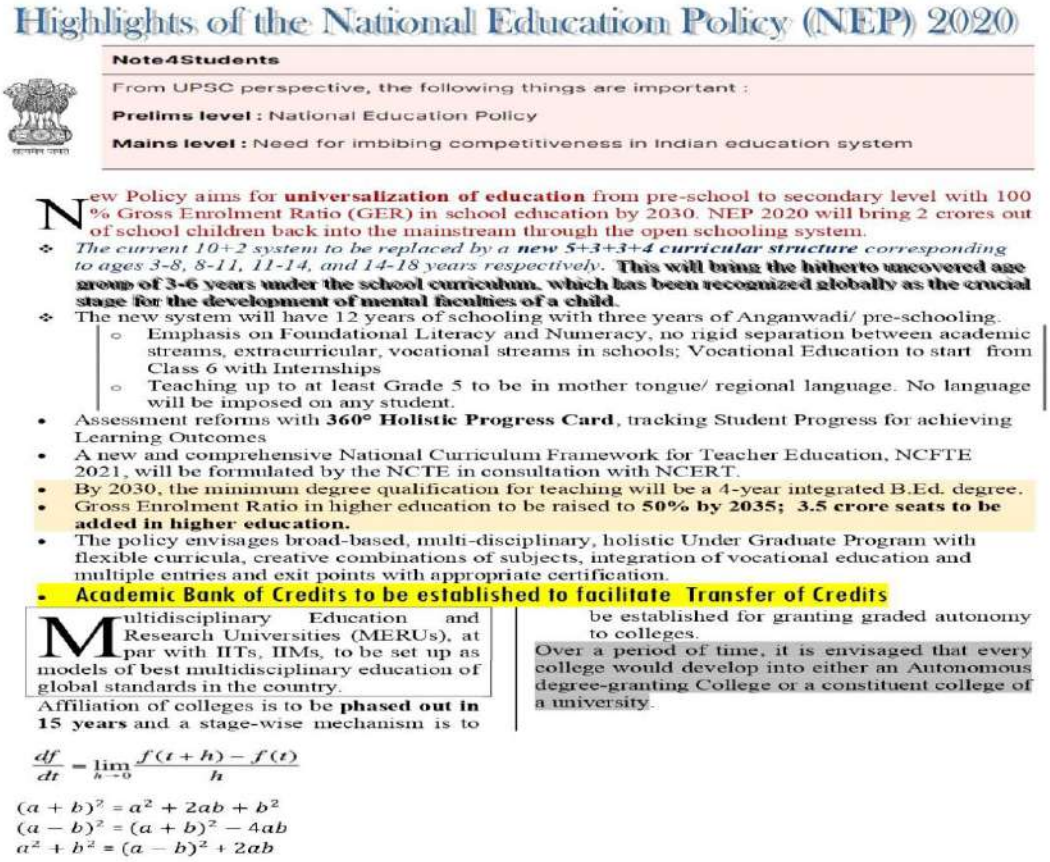
Reference Books:

1. Pundir&S.K. Pundir, A Text Book of BCA Mathematics - I, Rimple A, Pragatis Edition (IV)
2. B. S. Vatsa-Discrete Mathematics –New Age International Limited Publishers, New Delhi
3. C. L. Liu, D. P, Mohapatra, Elements of Discrete Mathematics, 4th Edition McGraw Hill Education Private Limited, New Delhi

Program Name	**BCA -AIML**	Semester	**I**
Course Title	**Fundamentals of Information Technology Lab**		
Course Code:	**BCA –AIML-1.4**	No.of Credits	**02**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

PART-A: MS WORD

1. Prepare a document using different formatting tools



Highlights of the National Education Policy (NEP) 2020

Note4Students

From UPSC perspective, the following things are important :

Prelims level : National Education Policy

Mains level : Need for imbibing competitiveness in Indian education system

New Policy aims for **universalization of education** from pre-school to secondary level with 100 % Gross Enrolment Ratio (GER) in school education by 2030. NEP 2020 will bring 2 crores out of school children back into the mainstream through the open schooling system.

- *The current 10+2 system to be replaced by a* ***new 5+3+3+4 curricular structure*** *corresponding to ages 3-8, 8-11, 11-14, and 14-18 years respectively.* **This will bring the hitherto uncovered age group of 3-6 years under the school curriculum, which has been recognized globally as the crucial stage for the development of mental faculties of a child.**
- The new system will have 12 years of schooling with three years of Anganwadi/ pre-schooling.
  - Emphasis on Foundational Literacy and Numeracy, no rigid separation between academic streams, extracurricular, vocational streams in schools; Vocational Education to start from Class 6 with Internships
  - Teaching up to at least Grade 5 to be in mother tongue/ regional language. No language will be imposed on any student.
- Assessment reforms with **360° Holistic Progress Card**, tracking Student Progress for achieving Learning Outcomes
- A new and comprehensive National Curriculum Framework for Teacher Education, NCFTE 2021, will be formulated by the NCTE in consultation with NCERT.
- By 2030, the minimum degree qualification for teaching will be a 4-year integrated B.Ed. degree.
- Gross Enrolment Ratio in higher education to be raised to **50% by 2035; 3.5 crore seats to be added in higher education.**
- The policy envisages broad-based, multi-disciplinary, holistic Under Graduate Program with flexible curricula, creative combinations of subjects, integration of vocational education and multiple entries and exit points with appropriate certification.
- **Academic Bank of Credits to be established to facilitate Transfer of Credits**

Multidisciplinary Education and Research Universities (MERUs), at par with IITs, IIMs, to be set up as models of best multidisciplinary education of global standards in the country.

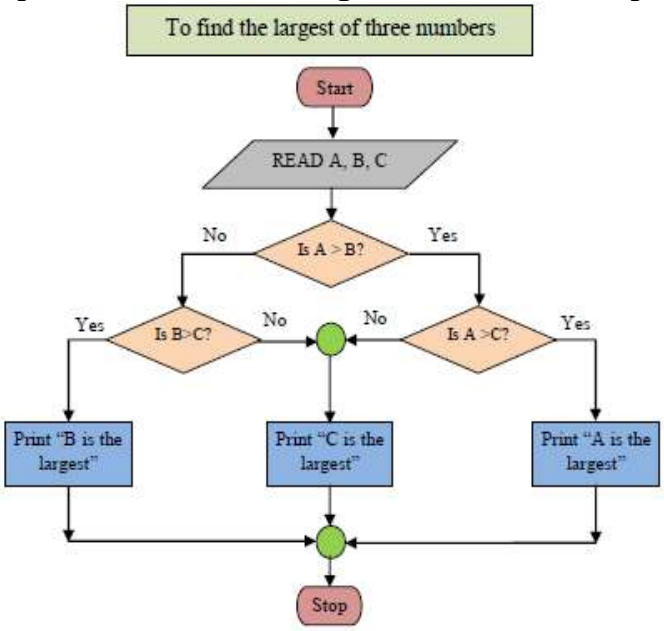
Affiliation of colleges is to be **phased out in 15 years** and a stage-wise mechanism is to be established for granting graded autonomy to colleges.

Over a period of time, it is envisaged that every college would develop into either an Autonomous degree-granting College or a constituent college of a university.

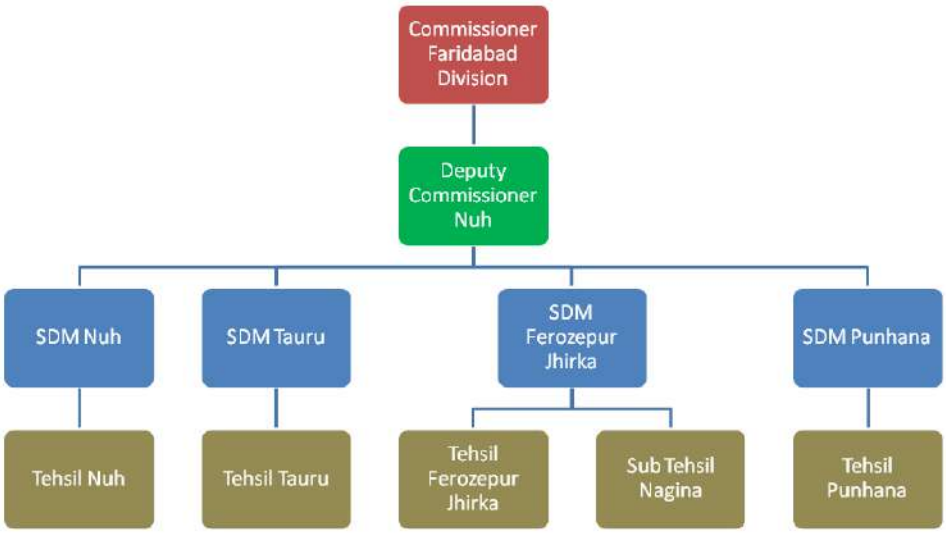
$$\frac{df}{dt} = \lim_{h \to 0} \frac{f(t+h) - f(t)}{h}$$

$$(a+b)^2 = a^2 + 2ab + b^2$$
$$(a-b)^2 = (a+b)^2 - 4ab$$
$$a^2 + b^2 = (a-b)^2 + 2ab$$

2. Prepare a document using SmartArt and Shapes tools



Organization Chart – Administration Faridabad Division



3. Prepare a document with table to store sales details of a company for different quarters and calculate total, average and find maximum, minimum sales value.

Branch Code	Branch	Sales in Quarters				Total	Avg
		1	2	3	4		
A101	Mangalore	354690	244610	383290	413670		
A102	Udupi						
Total (Across Branches)							
Average (Across Branches)							
Highest Sales (Across Branches)							
Lowest Sales (Across Branches)							

TIME TABLE

Class : I BCA						Room No. 206	
Day	I	II	III	IV		V	VI
Monday					LUNCH BREAK		
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday						***	

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

Interview call Letter Format

Date:
[Name of the candidate]
[Address]

Dear [name of the candidate]

This is to the reference of your application for the job [name of the job] indicating interest in seeking employment in our organisation. We thank you for the same.

We would like to inform you that your profile is being shortlisted for the job role and is best suited for it. Therefore, we would like to take a face to face interview with you on [date of interview] at [venue details].

We hope that the venue is suitable for you. If not please get in touch with us, so that we can arrange the date and venue according to your availability.

The company will reimburse you all the expenses incurred by you for this interview. This letter has an attachment in which you need to fill the details and carry it along on the date of interview. Please carry your CV also along with you.

Kindly confirm your availability for the date and venue. If there are any changes to be done, please contact us at phone number: [999xxxx999] and email id: abcnd@mail.com.

We look forward to seeing you.

Regards,
Name of the Manager
Designation Name
Company name

PART-B: MS POWERPOINT

1. Create a presentation (minimum 5 slides) about your college. It should contain images, chart, Bulleted text… The slides should be displayed automatically in a loop.

2. A simple quiz program. Use hyperlinks to move to another slide in the presentation to display the result and correct answer/wrong answer status. Use at least four questions.
   [**Navigation must be done by hyperlink**]

3. Create a presentation for a business proposal (minimum 5 slides).
   - Slides must include company logo in header
   - A title slide with table of contents
   - financial data of the company in the table
   - Company sales and profit in charts
   - Make use of animation and transition

4. Create a presentation for a college project (minimum 5 slides).
   - Master slide
   - Add comments for each slide
   - Add Audio and video to the slide
   - Add header and footer.
   - Add source citation
   - Make use of animation and transition

[Presentation must include title slide, Module Design, Chart, references]

PART-C: MS EXCEL

(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, FirstClass next, and so on. Within each class, average marks should be in descending order.

• Also draw the Column Chart showing theRollNo versus Average scored.

(Note: Worksheet creation and formatting 2 marks, calculations: 3 marks, sorting: 2 marks, chart: 3 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 and formatting 2 marks, Data validation: 2 marks, calculations: 2 marks, sorting: 2 marks, filtering: 2 marks)

3. Create Employee worksheet having EmpNo, EmpName, DOJ, Department, Designation 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)

• Using Pivot table, display the number of employees in each department and represent it using Pie chart.

(Note: Worksheet creation and formatting 2 marks, calculations: 3 marks, Pivot table: 3 marks, Chart: 2 marks)

4. Create a table COMMISSION containing the percentage of commission to be given to salesmen 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 and formatting: 2 marks, calculations: 2 marks, filtering: 6 marks)

PART-D: MS ACCESS

1. Create Employee database and table Emp using MS ACCESS with following Structure

Emp no	Ename	Designation	Dep tno	DOJ	Basic Salary
101	RAMESH	MANAGER	10	10/10/2000	25000
102	SMITHA	CLERK	12	12/5/1999	15000
103	DEVIKA	ATTENDER	10	11/9/2001	12000
104	RAJESH	HR	15	15/4/2000	12000
105	GIRISH	SUPERVISOR	12	6/11/2005	18000
106	SATHYA	DRIVER	16	11/9/2001	11000
107	MANOJ	SWEEPER	10	22/6/2006	8000
108	BHOOMIKA	SECURITY	15	12/5/1999	10500
109	KIRAN	CLERK	14	11/9/2001	15000
110	PRATHIKSHA	SUPERVISOR	10	8/8/2005	18000

Perform following operation

a) List all the Employees Who are working in Dept no.10
b) List all the Employees who get less than 20000 Salary
c) Update Salary by adding the increments as per the following:-
    i. 10% Increment in Basic Salary who get < 20000
    ii. 5% Increment in Basic Salary who get >=20000.

2. Create the " Order" database and a table "Orderdtl" having following records:

Order No	Order Date	Order Item	Order Qty	Order Price	Client Code	Delivery Type	Order Status
1011	12/02/2015	LED Monitors	100	750000	1025	Road	Delivered
1012	12/03/2015	CPU	12	500000	1026	SHIP	Not Delivered
1005	15/02/2014	Keyboard	80	48000	1027	Road	Delivered
1010	02/02/2016	LED Monitors	30	64000	1028	Flight	Delivered
1016	19/4/2015	Scanner	40	35000	1029	Road	Delivered
1009	9/05/2018	LED Monitors	25	125000	1030	Flight	Not Delivered
1008	13/8/2017	CPU	25	450000	1031	SHIP	Delivered
1014	1/7/2018	Printer	50	90000	1032	Road	Not Delivered

Execute following Query

a. Display all the Order No. which have not been yet Delivered.
b. Display all the Orders of LED Monitor and CPU.
c. Display all the Orders of LED Monitor and CPU which are not have been delivered yet.

3. Create a "Stock" database having "Inventory" table:

Item Code	Item Name	Opening Stock(Qty)	Purchase(Qty)	Sale (Qty)	Closing Stock(Qty)	Remark
101	MONITOR	100	25	35		
102	PRINTER	75	40	15		
103	SCANNER	120	30	20		
104	CPU	50	35	10		
105	KEYBOARD	105	45	55		

Perform the followings:

a) Calculate the closing stock of each item (Closing Stock = Opening Stock + Purchase – Sales)
b) Display all the Items which has closing stock < 100

c) If closing stock is less than 100 then set the remark as “Re-Order Level” otherwise “Enough Stock”.

4. Create a “Company” database having “Sales” table with fieldssaleid, quarter, product, no_of_sales.

   Perform the followings:

   a. Design a form to insert records to Sales table
   b. Generate a report to display Sales details of product based on quarters.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**MS WORD**	**8Marks**
Program-2	**MS POWERPOINT**	**7 Marks**
Program-3	**MS EXCEL**	**10**
Program-4	**MS ACCESS**	**10**
Practical Record		**05 Marks**
Total		**40 Marks**

Program Name	**BCA-AIML**	Semester	**I**
Course Title	**C Programming Lab**		
Course Code:	**BCA-AIML-1.5**	No.of Credits	**02**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

PART – A

1. Program to find the roots of quadratic equation using else if ladder.
2. Program to read two integer values &a operator as character and perform basic arithmetic operations on them using switch case (+, -, *, / operations)
3. Program to reverse a number and find the sum of individual digits. Also check for palindrome.
4. Program to calculate and display the first ‘n’ Fibonacci numbers
5. Program to find given number is a prime or not.
6. Program to count occurrences of each character in a given string.
7. Program to read string with alphabets, digits and special characters and convert upper case letters to lower case and vice a versa and retain the digits and special characters as it is.
8. Program to search for number of occurrences of a number in a list of numbers using one-dimensional array also display its positions.

PART-B

1. Program to find the largest and smallest elements with their position in a one-dimensional array.
2. Program to read ‘n’ integer values into a single dimension array and arrange them in ascending order using bubble sort method.
3. Menu driven Program to perform addition and multiplication of two Matrices
4. Program to find nCr and nPr using recursive function to calculate factorial.

5. Program to read a string and count number of letters, digits, vowels, consonants, spaces and special characters present in it using user defined function
6. Program sort a list of strings in ascending order using Pointers
7. Program to enter the information of a student like name, register number, marks in three subjects into a structure and display total, average and grade Display details in a neat form
8. Program to create a file NUMBER.txt, separates Odd and Even numbers and copy to file ODD.txt and EVEN.txt respectfully. Finally display all the three files.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:7 Marks Execution:8Marks**	**15Marks**
Program-2	**PART-B** **Writing:10 Marks Execution:10 Marks**	**20 Marks**
Practical Record		**05 Marks**
Total		**40 Marks**

MANGALORE UNIVERSITY

State Education Policy – 2024
[SEP-2024]

BLOWNUP SYLLABUS AND PRACTICAL LIST

FOR

II SEMESTER BCA- BACHELOR OF COMPUTER APPLICATIONS
BCA-ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

CURRICULUM STRUCTURE FOR II SEMESTER BCA-AI-ML

Semester II								
Sl. No	**Course Code**	**Title of the Course**	**Category of Courses**	**Teaching Hours per Week**	**SEE**	**IA**	**Total Marks**	**Credits**
1		**Language-I**	**Lang**	**4**	**80**	**20**	**100**	**3**
2		**Language-II**	**Lang**	**4**	**80**	**20**	**100**	**3**
3	**BCA - AIML –2.1**	**Data Structure using C**	**Core**	**4**	**80**	**20**	**100**	**3**
4	**BCA- AIML –2.2**	**Database Management System**	**Core**	**4**	**80**	**20**	**100**	**3**
5	**BCA- AIML –2.3**	**Computer Architecture**	**Core**	**5**	**80**	**20**	**100**	**5**
6	**BCA - AIML –2.4**	**Data Structures Lab**	**Practical**	**4**	**40**	**10**	**50**	**2**
7	**BCA - AIML –2.5**	**Database Management System Lab**	**Practical**	**4**	**40**	**10**	**50**	**2**
8		**Constitution/ Values**	**Compulsory**	**2**	**40**	**10**	**50**	**2**
Sub - Total				**31**	**520**	**130**	**650**	**23**

Program Name	**BCA-AIML**	Semester	**II**
Course Title	**Data Structure using C(Theory)**		
Course Code:	**BCA-AIML-2.1**	No.of Credits	**03**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Topics	**Book**	**Chapter /Page No/Section**
UNIT 1[13 HOURS]		
Introduction and Overview: Definition, Elementary data organization, Data Structures, Data Structures operations, Preliminaries: Mathematical notations and functions, Algorithmic notations, control structures, Arrays: Definition, Linear arrays, , Representation of Linear Arrays in Memory, Traversing Linear arrays, Inserting and deleting, Multi-dimensional arrays, Matrices and Sparse matrices.	BOOK-1	Chapter-1 1.1,1.2,1.3,1.4 Chapter-2 2.1,2.2,2.3,2.4 Chapter-4 4.1.4.2.4.4.4.5,4.6,4.10,4.17
Fundamentals of Algorithmic problem Solving: Important Problem Type Fundamentals of Data Structures, Fundamentals of the Analysis of Algorithm Efficiency, Analysis Framework, Measuring the input size, Units for measuring Running time, Orders of Growth, Worst-case, Best-case and Average- case efficiencies.	BOOK-2	1.2,1.3 2.1(page no 40-46)
Asymptotic Notations and Basic: Efficiency classes, Informal Introduction, O-notation, Ω-notation, θ-notation	BOOK-2	2.2 (Page no 49-52)

UNIT 2[13 HOURS]		
Linked list: Definition, Representation of Singly Linked List in memory, traversing a Singly linked list, searching in a Singly linked list, Memory allocation, Garbage collection, Insertion into a singly linked list, Deletion from a singly linked list; Doubly linked list, Header linked list, Circular linked list.	BOOK-1	Chapter-5 5 1,to 5 11.
Stacks: Definition, Array representation of stacks, linked representation of stacks, Arithmetic Expressions: Polish Notation, Conversion of infix expression to postfix expression, Evaluation of Postfix expression, Applications of Stacks, Recursion, Towers of Hanoi, Implementation of recursive procedures by stack.	BOOK-1	Chapter-6 6.1,6.2,6.3,6.4,6.6,6.7,6.8,6.9 ,6.10
Queues: Definition, Array representation of queue, Linked list representation of queues. Types of queue: Simple queue, Circular queue, Double-ended queue, Priority queue, Operations on Queues, Applications of queues.	BOOK-1	6.11,6.12,6.14,6.15,6.16,6.17
UNIT 3[13 HOURS]		

Binary Trees: Definitions, Tree Search, Traversal of Binary Tree, Tree Sort, Building a Binary Search Tree, Contiguous Representation of Binary Trees: Heaps, External Searching: B-Trees, Applications of Trees. **Graphs:** Mathematical Background, Computer Representation, Graph Traversal	BOOK-1 BOOK-1	Chapter-7 7.1,7.2,7.3,7.4,7.5,7.8,7.9,7.17,7.21,7.24, Chapter-8 8.1,8.2,8.3,8.5,8.7
UNIT 4[13 HOURS]		
Searching: Introduction and Notation, Sequential Search, Binary Search, Comparison of Methods. Sorting: Introduction and Notation, Insertion Sort, Selection Sort, Shell Sort, Merge sort, Quick sort for Contiguous List. **Hashing:** Sparse Tables, Choosing a Hash function, Collision Resolution with Open Addressing, Collision Resolution by Chaining.	BOOK-1 BOOK-1	Chapter-4 4.8,4.9 Chapter -9 9.1,9.3,9.4,9.6,9.7 (Quick sort-6.7) Chapter -9 9.10

Text Books:

1. Seymour Lipschutz, "Data Structures with C", Schaum' soutLines, Tata McGraw Hill, 2011.
2. Anany Levitin: "Introduction to The Design & Analysis of Algorithms"

Reference Books:

1. Ellis Horowitz and Sartaj Sahni, Fundamentals of Data Structures, Computer Science Press, 1982.
2. Aaron M. Tenenbaum , Data structures using C, First Edition, Pearson Education
3. Kamathane, Introduction to Data structures, Pearson Education , 2004

4. Y. Kanitkar, Data Structures Using C, Third Edition, BPB
5. Padma Reddy: Data Structure Using C, Revised Edition 2003, Sai Ram Publications.
6. Sudipa Mukherjee, Data Structures using C – 1000 Problems and Solutions, McGraw Hill Education, 2007

Program Name	**BCA-AIML**	Semester	**II**
Course Title	**Database Management System(Theory)**		
Course Code:	**BCA-AIML-2.2**	No.of Credits	**03**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Topics	**Book**	**Chapter /Page No/Section**
UNIT 1[13 HOURS]		
Database Architecture: Introduction to Database system applications. Characteristics, Data models, Database schema, Database architecture, Data independence, Database languages, GUIs, and Classification of DBMS. **E-R Model:** E-R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship types, Roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	BOOK-1 Chapter 1 BOOK-1 Chapter 2 BOOK-1 Chapter 3	Section 1.1,1.2,1.3,1.4,1.5,1.6 Section 2.1,2.2,2.3,2.4,2.5,2.6 Section 3.3(3.3.1,3.3.2),3.4,3.5,3.6, 3.7.1 to 3.7.3
UNIT 2[13 HOURS]		
Relational Data Model: Relational model concepts. Characteristics of relations. Relational model constraints: Domain constrains, key constraints, primary & foreign key constraints, integrity constraints and null values. **Data Normalization:** Functional dependencies. Normalization. First normal	BOOK-1 Chapter 5 BOOK-1 Chapter 14	Section 5.1,5.2,5.3 Section 14.1,14.2,14.3,14.4,14.5

form, Second normal form, Third normal form. Boyce-Codd normal form.	BOOK-1 Chapter 15	Section 15.1
UNIT 3[13 HOURS]		
INTERACTIVE SQL: Table fundaments, oracle data types, CREATE TABLE command, Inserting data into table, Viewing Data in the table, sorting data in a table, Creating a table from a table, Inserting data into a table from another table, Delete operations, Updating the contents of a table, Modifying the structure of tables, Renaming tables, destroying tables, displaying table structure. **DATA CONSTRAINTS: Types** of data constraints, IO constraints-The PRIMARY KEY constraint, The FOREIGN KEY constraint, The UNIQUE KEY constraint, Business Rule Constraints- NULL value concepts NOT NULL constraints, CHECK constraint, DEFAULT VALUE concepts. **COMPUTATIONS ON TABLE DATA:** Arithmetic Operators, Logical Operators, Range Searching, Pattern Matching, Oracle Table – DUAL, Oracle Function- Types, Aggregate Function, Date Conversion Function. GROUPING DATA FROM TABLES IN SQL**,** Group By clause, Having clause, subqueries, JOINS, Using the UNION, INTERSECTION, MINUS clause	BOOK-2 Chapter 7 BOOK-2 Chapter 8 BOOK-2 Chapter 9 BOOK-2 Chapter 10	Page No.114-115,118-130,131,133 Page No. 138-154,156-157 Page No 161-172,181 Page No 192-195,199-204,209-221,223-227
UNIT 4[13 HOURS]		
INTRODUCTION TO PL/SQL: Advantages of PL/SQL, The Generic PL/SQL Block, PL/SQL-The character set, Literals, PL/SQL datatypes, variables, Logical comparisons, Displaying User Messages on The VDU Screen, comments.	BOOK-2 Chapter 15	Page No 338-342,344-348

Control Structure - Conditional Control, Iterative Control **PL/SQL Transactions:** Cursor-Types of Cursor, Cursor Attributes. Explicit cursor-Explicit cursor Management, cursor for loop **PL/SQL Database Objects:** Procedures and Functions, Oracle Packages, Error Handling in PL/SQL, Database Triggers.	BOOK-2 Chapter 16 BOOK-2 Chapter 17 BOOK-2 Chapter 18	Page No.354-369 Page No.393-395,399-401 Page No.404-418

Text Book:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015

Reference Books:

1. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
2. Introduction to Database System, C J Date, Pearson, 1999.
3. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6th Edition, McGraw Hill, 2010.
4. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3rd Edition, McGraw Hill, 2002

Program Name	**BCA-AIML**	Semester	**II**
Course Title	**Computer Architecture(Theory)**		
Course Code:	**BCA-AIML-2.3**	No.of Credits	**05**
Contact hours	**5 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**20**	Summative Assessment Marks	**80**

Topics	**Book**	**Chapter /Page No/Section**
UNIT 1[13 HOURS]		
Digital computers and Digital system: Introduction to Number system, Decimal number, Binary number, Octal and Hexadecimal numbers, Number base conversion, Complements, Binary codes, Binary arithmetic's, 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.	BOOK-1 Chapter 1 BOOK-1 Chapter 2	1.2,1.3,1.4,1.5 2.1,2.2,2.3
UNIT 2[13 HOURS]		
Digital logical gate: Boolean functions, Canonical and Standard forms, other logic operations, Digital logic gates, Universal gate. **Simplification of Boolean function**: The map method, Two and three variable maps, Four-variable maps, Don't care conditions, Product of sum Simplification, NAND	BOOK-1 Chapter 2 Chapter 4 BOOK-1 Chapter 3	2.4,2.5,2.6,2.7 (Excluding 2.7.1),4.7.1 3.1,3.2,3.3,3.5,3.8

implementation, NOR implementation. Implementation of EX-OR,EX-NOR using NAND and NOR gate		
UNIT 3[13 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	BOOK-1 Chapter 4 BOOK-1 Chapter 5	4.1,4.2,4.3,4.4,4.5 5.1,5.2,5.3,5.4,5.5,5.6
UNIT 4[13 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, Registers, Shift registers, Timing sequences, Bidirectional shift register.	BOOK-1 Chapter 6 BOOK-1 Chapter 7	6.1,6.2,6.3,6.4,6.6,6.7,6.8 7.1,7.2,7.3,7.4

Text Book:

1. M.Morris Mano,Digital Logic and Computer design, PHI, 2015

Reference Books:

1. Thomas L Floyd, Digital Fundamentals, 10th Edition, Pearson, 2011.
2. Thomas. C. Bartee, Digital Computer Fundamentals, 6th edition, TMH.

Program Name	**BCA-AIML**	Semester	**II**
Course Title	**Data Structures Lab**		
Course Code:	**BCA-AIML-2.4**	No.of Credits	**02**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

PART-A

1. Program to sort the given list using selection sort technique.
2. Program to sort the given list using insertion sort technique
3. Program to solve Tower of Hanoi using Recursion
4. Program to reverse String using Stack
5. Program to search an element using recursive binary search technique.
6. Program to implement Stack operations using arrays.
7. Program to implement Queue operations using arrays.
8. Program to implement dynamic array. Find smallest and largest element.

PART-B

1. Program to sort the given list using merge sort technique.
2. Program to implement circular queue using array.
3. Program to sort the given list using quick sort technique.
4. Program to implement Stack operations using linked list.
5. Program to implement Queue operations using linked list.
6. Program to evaluate postfix expression.
7. Program to perform insert node at the end, delete a given node and display contents of single linked list.
8. Menu driven program for the following operations on Binary Search Tree(BST) of Integers
   (a) Create a BST of N Integers
   (b) Traverse the BST in Inorder, Preorder and Post Order.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:5 Marks Execution:3Marks**	**15 Marks**
Program-2	**PART-B** **Writing:8 Marks Execution:4Marks**	**20 Marks**
Practical Record		**05 Marks**
Total		**40Marks**

Program Name	**BCA-AIML**	Semester	**II**
Course Title	**Database Management System Lab**		
Course Code:	**BCA-AIML-2.5**	No.of Credits	**02**
Contact hours	**4 Hours per Week**	Duration of SEA/Exam	**3 Hours**
Formative Assessment Marks	**10**	Summative Assessment Marks	**40**

PART-A

1. Create a table EMPLOYEE using SQL command to store details of employees such as EMPNO, NAME, DESIGNATION, DEPARTMENT, GENDER and SALARY. Specify Primary Key and NOT NULL constraints on the table. Allow only 'M' or 'F' for the column GENDER. DEPARTMENT can be SALES, ACCOUNTS, IT. Choose DESIGNATION as CLERK, ANALYST, MANAGER, ACCOUNTANT and SUPERVISOR that depends on department

   Write the following SQL queries:

   a) Display EMPNO, NAME and DESIGNATION of all employees whose name ends with RAJ.
   b) Display the details of all female employees who is earning salary within the range 20000 to 40000 in SALES or IT departments.
   c) List the different DEPARTMENTs with the DESIGNATIONs in that department.
   d) Display the department name, total, average, maximum, minimum salary of the DEPARTMENT only if the total salary given in that department is more than 30000.
   e) List the departments which have more than 2 employees.

2. Create a table CLIENT to store CLIENT_NO, NAME, ADDRESS, STATE, BAL_DUE. Client no must start with 'C'. Apply the suitable structure for the columns. Specify Primary Key and NOT NULL constraints on the table. Insert 10 records.

Write the following SQL queries:

a) From the table CLIENT, create a new table CLIENT1 that contains only CLIENT_NO and NAME , BAL_DUE from specified STATE. Accept the state during run time.
b) Create a new table CLIENT2 that has the same structure as CLIENT but with no records. Display the structure and records.
c) Add a new column by name PENALTY number (10, 2) to the CLIENT.
d) Assign Penalty as 10% of BAL_DUE for the clients C1002, C1005, C1009 and for others 8%. Display Records.
e) Change the name of CLIENT1 as NEW_CLIENT.
f) Delete the table CLIENT2.

3. Create a table BOOK using SQL command to store Accession No, TITLE, AUTHOR, PUBLISHER, YEAR, PRICE. Apply the suitable structure for the columns. Specify Primary Key and NOT NULL constraints on the table. Insert 10 records.

Write the following SQL queries:

a) List the details of publishers having 'a' as the second character in their names.
b) Display Accession No., TITLE, PUBLISHER and YEAR of the books published by the specified author before 2010 in the descending order of YEAR. Accept author during run time.
c) Modify the size of TITLE to increase the size 5 characters more.
d) Display the details of all books other than Microsoft press publishers.
e) Remove the records of the books published before 1990.

4. Create a table SALES with columns SNO, SNAME, MANAGER_NAME, JOIN_DATE, DATE_BIRTH, SALARY,SALES_AMOUNT and COMMISSION. Minimum age for joining the company must be 18 Yrs. Default value for Commission should be 0. Apply the suitable structure for the columns. Specify Primary Key and NOT NULL constraints on the table. Insert 10 records with data except commission. Manager of Manager can be NULL.

Write the following SQL queries:

a) Display the details of Sales Persons whose salary is more than Average salary in the company.
b) Update commission as 20% of Sales Amount.

c) Display SNO, SNAME, MANAGER_NAME, SALARY, COMMISSION, MANAGER_SALARY of the sales persons getting sum of salary and commission more than salary of manager.(Self join)
d) Display the records of employees who finished the service of 10years.

5. Create a table Sales_Details with the columns SNO, MONTH, TARGET and QTY_SOLD to store the Sales Details of one year. Specify the composite primary key to the columns SNO and MONTH. TARGET and SALES must be positive numbers.

   Write the following SQL queries:

   a. Display the total sales by each sales person considering only those months sales where target was reached.

   b. If a commission of RS.50 provided for each item after reaching target, calculate and display the total commission for each sales person.

   c. Display the SNO of those who never reached the target.

   d. Display the SNO, MONTH and QTY_SOLD of the sales persons with SNO S0001 or S0003

6. Create a table Bank with the columns ACNO, ACT_NAME, ACT_TYPE and BAL. Specify the Primary Key. Initial BAL must be greater than 500.

   Write a PL/SQL program to perform debit operation by providing acct_no and amount required. The amount must be greater than 100 and less than 20000 for one transaction. If the account exist and BAL-amount>100 Bank table must be updated, otherwise "NO SUFFFICIENT BALANCE" message should be displayed. If account number is not present then display "NO SUCH ACCOUNT" message to the user.

7. Create a table STOCK_DETAIL with the columns PNO, PNAME and QTY_AVL to store stock details of computer accessories. Specify Primary Key and NOT NULL constraints on the table. QTY_AVL should be positive number.

   Write a PL/SQL Program to define a user defined exception named "LOW_STOCK" to validate the transaction. The program facilitates the user to purchase the product by providing product number and quantity required. It

should display an error message “NO SUFFICIENT STOCK” when the user tries to purchase a product with quantity more than QTY_AVL, Otherwise the STOCK_DETAIL table should be updated for valid transaction.

8. Write a PL/SQL cursor program to calculate electricity bill of several domestic customers. Accept Input RR No, name of the customer, previous meter reading, and current meter reading from the table. The rates of electricity consumption are as follows - For the first 30 units Rs. 2.5 per unit, for the next 70 units Rs. 3.5 per unit, for the next 100 units Rs. 4.5 per unit, for the next 100 units Rs. 6 per unit and for units above 300 Rs. 8 per unit. A fixed amount of Rs. 150 is also charged. 5% tax to be paid on the sum of bill amount & fixed amount. Use Data validation to see that current reading is more than previous reading. Assume the records of 5 customer details.

   Create the output which contains the RR number, name of the Customer, previous meter reading, and current meter reading, Units Consumed, Total Bill in the following format.

RR No.	Customer Name	Current Meter Reading	Previous Meter Reading	Units Consumed	Total Bill

PART-B

1. Create the following tables by identifying primary and foreign keys. Specify the not null property for mandatory keys.
   SUPPLIERS (SUPPLIER_NO, SNAME, SADDRESS, SCITY)
   COMPUTER_ITEMS(ITEM_NO,SUPPLIER_NO,ITEM_NAME, IQUANTITY)
   Consider three suppliers. A supplier can supply more than one type of items.

   Write the SQL queries for the following

   a. List *ITEM* and *SUPPLIER* details in alphabetical order of city name and in each city decreasing order of IQUANTITY.

   b. List the name ,city,and address of the suppliers who are supplying keyboard.

c. List the supplier name, items supplied by the suppliers ‘Cats’ and ‘Electrotech’.

d. Find the items having quantity less than 5 and insert the details of supplier and item of these, into another table NEWORDER.

2. Create the following tables identifying Primary and Foreign keys. Specify the not null property for mandatory keys.
EMPLOYEE_MASTER (EMP_ID, EMP_NAME, EMAIL_ID, EMP_ADDRS, PHONE)
A*TTENDANCE (EMP_ID, MONTH, WOM, MHRS, THRS, WHRS, TRHRS, FHRS, SHRS, SUHRS).*
(Valid values for WOM<=5, MONTH can be 1-12). Apply appropriate constraints. Consider 3 employees. And attendance records for at least two months.

Write the SQL queries for the following

a) Display *EMP_ID*,*EMP_NAME* and *EMAIL_ID* of all employees who are working on every Sunday of 2nd and 4th week in a month.

b) Display total hours worked by each employee in each month with EMP_ID.

c) Display the names of the employees who never attended the duty so far(Attendances not given so far).

d) Display the employee name, month, week, total hours worked for employees who have total no. of hours more than 20 hrs. a week.

3. Create the following tables by identifying primary and foreign keys, specify the not null property for mandatory keys.

PRODUCT_DETAIL				
P_NO	**PRODUCTNAME**	**QTYAVAILABLE**	**PRICE**	**PROFIT %**

P0001	Monitor	10	3000	20
P0002	Pen Drives	50	650	5
P0003	CD Drive	100	10	3
P0004	Key Board	25	600	10

PURCHASED_DETAIL

CUSTNO	**P_NO**	**QTYSOLD**
C1	P0003	2
C2	P0002	4
C3	P0002	10
C4	P0001	3
C1	P0004	2
C2	P0003	2
C4	P0004	1

Write the following SQL queries:

a) Display total amount spent by C2.
b) Display the names of product for which either QtyAvailable is less than 30 or total QtySold is less than 5(USE UNION).
c) Display the name of products and quantity purchased by C4.
d) How much Profit does the shopkeeper gets on C1's purchase?
e) How many 'Pen Drives' have been sold?

4. Create table STUDENT_PROFILE includes Rollno, name, class, ECCC(Extra-Co curricular he belongs to such as SPORTs, NSS etc.) and another table MARKS_REPORT includes Rollno, Internal_Test, Marks1, Marks2, Marks3 and ECCC_marks.

Constraints

- Internal _Test can be either 1 or 2.
- Each mark can be 0-100. Absence in the test can be entered as -1.
- Consider atleast 3 classes.

Apply suitable data type and constraints to each column.
Insert 5 students marks report in the both the tests.

Write the following SQL queries:

a) Find number of students failed class- wise.
b) Display the complete details of the students secured distinction(Percentage>=70) in I BCA.
c) Display class and highest total marks in second internals in each class.
d) Display the student name with rollno and class of those who passed in I internals and failed in II internals.(use SET operator)

5. Write a PL/SQL program to compute the selling price of books depending on the book code and category. Use Open, Fetch and Close.The Book_detail table contains columns: Book Code, Author, Title, Category and Price.Insert 10 records.

The selling price=Price-Discount.

The discount is calculated as follows:

Book Code	Category	Discount Percentage
A	Novels	10% of Price
	Technology	12.5% of Price
B	Commerce	18% of Price
	Science	19% of Price
C	Songs	25% of Price
	Sports	24% of Price
D	All	28% of Price

Print the result in tabular form with proper alignment

Book Code	category	title	author	price	discount %	discount amount	sell price
=====	=======	=====	====	=====	======	=====	

---

6. Write a PL/SQL program to display employee pay bill (using Cursor For loop) Use a **Procedure** to receive basic pay and to compute DA, HRA, Tax, PF, Gross Pay and Net Pay(Use OUT). Base table contains the following columns empnum, empname, basic pay.Insert 3 records.

Allowances are computed as follows.

Basic Pay	DA	HRA

<=20000	35% of Basic	8% of Basic
>20000 &<=30000	38%	9%
>30000 &<=40000	40%	10%
>40000	45%	10%

Gross=Basic+DA+HRA
PF=12% of Gross or Rs. 2000 whichever is minimum.
PT=Rs. 100 upto Gross is 25,000 else Rs. 200.
Net=Gross-(PF+PT)

Print Pay slip as follows.

```
================PAYSLIP==================
Empno              :10011          Empname : Raj
Basic Pay          :20000             P.F.: 3432
DA                 :7000              P.T.: 200
H.R.A.             :1600
Gross              :28600        Net Pay : 24968
*********************************************************
================PAYSLIP==================
Empno              :10012          Empname : Rani
Basic Pay          :30000             P.F.: 5292
DA                 :11400             P.T.: 200
H.R.A.             :2700
Gross              :44100        Net Pay : 38608
*********************************************************
```

7. Given the following tables:
   ITEM_MASTER(itemno, name, stock, unit_price) [Apply the Primary key and check constraint for stock and price as >0] [Insert 5 records]
   ITEM_TRANS(itemno, quantity and trans_date)
   Create a **package** PCK_ITEM includes a function CHK_ITEM and a procedure PROC_ITEM.

   Function CHK_ITEM gets one argument itemno and is used to check whether the parameter itemno exists in ITEM_MASTER and should return 1 if exist. Otherwise 0 and displays proper message.
   Procedure PROC_ITEM gets two arguments itemno and quantity, and is used to perform the following if item exists. If required quantity is not available, give appropriate message. If available , insert a record of this transaction to ITEM_TRANS and modify the stock in ITEM_MASTER.

Write a PL/SQL program to accept ITEM_NO and Quantity needed of required item. Use Package to do the transaction process(Transaction date can be current date).

OUTPUT to be shown as follows:

```
Enter value for accept_itemno: 1
old   5:            X:=&accept_itemno;
new   5:            X:=1;
Enter value for quantity: 3
old   6:          M:=&quantity;
new   6:          M:=3;
Item :aa   Quantity  :3  Price  :15 Total Amount  :45
```

8. Consider the following tables

   LIBRARY(Accession no, Title, Author, Publication, Status). Status can be **A** for available and **I** for Issued. Insert 3 records with status '**A**' for all initially.

   ISSUE(Rollno, Accession no, Borrowdate, returndate).

   OUTDATED(Accession no, Title, Author, Publication, tdate),

   Write the following Trigger programs.

   i. Whenever the book is to be issued, Insert a new record to ISSUE without having return date. When the record is **inserted** to ISSUE table, trigger TRIG_ISSUE to be executed to update status in LIBRARY as ***'I'.***
   ii. Whenever book is returned, update return date of that record as todays date in ISSUE table. When the record is **updated** to ISSUE table, trigger TRIG_ISSUE to be executed to update status in LIBRARY as ***'A'.***
   iii. Whenever the book is **deleted** by accepting Accession no. for status 'A' (at SQL >), trigger TRIG_OUTDATE has to be executed to insert a record to OUTDATED.

   Write a PL/SQL program to accept Rollno, Accession no and transaction(**B** for Borrow &**R** for Return). Check for the existence of given Accession no and proceed as follows.

- If does not exist, display the message 'Given accession no. is not available'
- If exist and transaction is B, check the status as 'A', then insert to ISSUE, and display the message with accno, author, title, publication and roll no to whom it is issued.
- If exist and transaction is R, then update return date as current system date in ISSUE by accepting Rollno and Aceession no(for the record having return date empty).

If searched record is not available, raise the predefined exception.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	**PART-A** **Writing:5 Marks Execution:3Marks**	**15 Marks**
Program-2	**PART-B** **Writing:8 Marks Execution:4Marks**	**20 Marks**
Practical Record		**05 Marks**
Total		**40 Marks**