MANGALORE UNIVERSITY

National Education Policy – 2020(NEP-2020)

Bachelor of Computer Applications (BCA) Degree Programme

III SEMESTER BCA

2022-2023 Onwards

Blown Up Syllabus and Practical List
And
Open Elective Blown up Syllabus

Course Code: 21BCA3C7L	Course Title: **Database Management System (DBMS)**
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Topics	Chapter No	Page No/Section
UNIT 1 [11 HOURS]		
Database Architecture: Introduction to Database system applications. Characteristics. Users Data models. Database schema. Database architecture. Data independence. Database languages, GUI's, 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 [11 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 form, Second normal form, Third normal form. Boyce-Codd normal form.	Book 1 Chapter 5 Book1 Chapter 14 Book1 Chapter 15	Section 5.1, 5.2, 5.3 Section 14.1, 14.2, 14.3, 14.4, 14.5 Section 15.1
UNIT 3 [10 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.	Book 2 Chapter 7 Book 2 Chapter 8 Book 2	Page No. 114-115, 118-130, 131, 133 Page No. 138-154, 156-157 Page No. 161-172, 181

COMPUTATIONS DONE 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	Chapter 9 Book 2 Chapter 10	Page No. 192-195, 199-204, 209-221, 223-227
UNIT IV [10 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. 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.	Book 2 Chapter 15 Book 2 Chapter 16 Book 2 Chapter 17 Book 2 Chapter 18	Page No. 338-342, 344- 348 Page No. 354-369 Page No. 393-395, 399-401 Page No. 404-418

Course Title: **C# and Dot Net Framework**	Course code: 21BCA3C8L
Total Contact Hours: 42	Course Credits: 03+02
Formative Assessment Marks: 40	Duration of SEE/Exam: 02 Hours
Summative Assessment Marks: 60	

Topics	**Chapter No**	**Page No/Section**
UNIT 1[11 HOURS]		
Introduction to .Net Technologies: Introduction to Web Technologies. HTML Basics, Scripts. Sample Programs. Advantages and Disadvantages of Client-side and Server-side Scripts. Overview of Client-side Technologies and Server-side Technologies. **Introduction to C#:** Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Control Structures-Methods, Arrays, Strings, Structures, Enumerations	Material BOOK 1	Chapter 3: 3.1 to 3.10, 3.14 Chapter 4: Full Chapter 5: 5.1 to 5.14 Chapters [6,7,8] Full Chapter 9: 9.1 to 9.5 Chapter 10: 10.1 to 10.8 Chapter 11: 11.1 to 11.8
UNIT 2[11 HOURS]		
OOPS with C#: Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading Delegates, Events, Errors and Exceptions. **Introduction to VB.NET:** Introduction, VB.NET -IDE – Start page, menu system, tool bars, New project dialog box, graphical designers, code designers, Intellisense, object browser, Toolbox, Solution explorer, property window, dynamic help window, component tray, server explorer, output window, task list, command window	BOOK- 1 BOOK -2	BOOK- 1 Chapter 12: 12.1 to 12.20 Chapters [13,14,15,16 & 18] Full BOOK -2 Chapter 1 – Page no 28 to Page no 47.
UNIT 3[10 HOURS]		
VB.NET Language: Basic Keywords. Data Types. VB.NET statements. Conditional statements: If Else, Select Case, Switch and Choose Loops: Do, For Next, For Each Next, While loop. Arrays. Subroutines and Functions in VB.NET. **Application Development on .NET:** Vb.NET: Windows Forms. **Working with Controls-** Textbox, Label, Button Timer, Picture-box, Group-box, Listbox , Combo-box,	BOOK -2 BOOK -2 BOOK -2	BOOK -2 Chapter 2: Page no 52 to 56, 60 to 61, 65 to 69, 72 to 74, 78 to 80, 83 to 91 (Excluding Switch and Choose functions) Chapter 3: Page no 98 to 103, 108 to 115, 120 to 122 (Understanding Scope)

Horizontal and Vertical Scrollbar, Track-bar, and Progress-bar.		Chapter 4: Page no 138 to 164, 168 to 172, 177 to 178, 181 to 184 Chapter 5: Page no 200 to 208, 219 to 220 Chapter 6: Page no 233 to 245, 257 to 259 Chapter 7: Page no 268 to 278, 286-298 Chapter 8: Page no: 311 to 316, 326 to 327 Chapter 10: 430 to 431
UNIT 4[10 HOURS]		
Data Access Connectivity: ADO.NET: Introduction to ADO.NET, ADO vs ADO.NET Architecture: Data reader, Data adopter, Accessing Data with ADO.NET. Binding Controls to Databases: Various ways to bind the data, simple binding, complex binding, binding data to control. Programming Web Applications with Web Forms. Web Controls in C#, ASP.NET applications with ADO.NET.	BOOK -2 BOOK 3	BOOK -2 Chapter 21: Page no 822 to 846, 853 to 854, 858 to 862 Chapter 22: Page no 864 to 870 Chapter 23: SQLConnection (Page no 919) SQLCommand (Page no 922) SQLDataAdapter (Page no 927) DataSet (Page no 928) SQLDataReader (Page no 931) BOOK 3 Chapter 4: Page no 133 to 137 (Except Literal and Placeholder controls) Chapter 6: Page no 214 to 219 Chapter 8: Page no 294 to 312, 314 to 316

Text Books:

1. "Programming C#" – E .Balagurusamy, 3rd Edition, TMH publications
2. "Visual Basic .NET Programming" – Black Book, Steven Holzner, DreamTech Press
3. "ASP .NET 4.5" – Black Book, DreamTech Press

Material – To be provided for First Chapter in Unit – I.

References:

1. "Visual Basic.NET", Shirish Chavan, 3rd Edition, Pearson Education, 2009.
2. "ASP.NET and VB.NET Web Programming", Matt J. Crouch, Edition 2012.
3. "Computing with C# and the .NET Framework", Arthur Gittleman, 2nd Edition, Jones & Bartlett Publishers, 2011

Course Title: **Computer Communication and Networks**	Course code: 21BCA3C9L
Total Contact Hours: 42	Course Credits: 03
Formative Assessment Marks: 40	Duration of SEE/Exam: 02 Hours
Summative Assessment Marks: 60	

Topics	**Chapter No**	**Page No/Section**
UNIT 1[11 HOURS]		
Introduction: Uses of Computer Networks and its Applications-Business Applications, Home Applications, Mobile Users, Social Issues. Network Hardware-Local Area Networks, Metropolitan Area Networks, Wide Area Networks, Internetworks. Network sofware Reference Models-The OSI Reference Model, The TCP\IP Reference Model,A Comparison of the OSI and TCP Reference Models. .	Chapter 1	1-51(personal area networks-excluded) (The Model Used in This Book- excluded)
UNIT 2[11 HOURS]		
The Physical Layer: Transmission Media- Twisted Pair, CoaxialCable,and Fiber Optics. Wireless Transmission- Radio Transmission, Microwave Transmission, Infrared, Light Transmission.Multiplexing-Frequency division, time division, code division, Switching.	Chapter 2	95-116 , (Magnetic Media, Power Lines –excluded)
The Data Link Layer: Data link layer design issues-Services Provided to the Network Layer, Framing, Error Control, and Flow Control.Error Detection and Correction-Error-Correcting Codes, Error –Detecting Codes.Elementary Data Link Protocols-An Unrestricted Simplex Protocol, A Simplex Stop-and-Wait Protocol for an Error-Free Channel, A Simplex Protocol for a Noisy Channel.Sliding Window Protocols –A One Bit Sliding Window Protocol, A Protocol Using Go back n, A Protocol using Selective Repeat.	Chapter 3	(The Electromagnetic Spectrum-excluded) 125, 132-138 , 161-164 , 194-220 226-244
UNIT 3[10 HOURS]		
The Network Layer: Network layer design issues-Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection-Oriented Service, Comparison of Virtual Circuit and Datagram Networks.Routing Algorithms-Flooding, Distance Vector Routing, Link State Routing,Hierarchical ,Routing,Broadcast Routing, Multicast Routing, Anycast	Chapter 5	355-362 368-386 (The Optimality principle and Shortest path algorithm-excluded) 392-398

Routing.Congestion Control Algorithms-Approaches to Congestion Control,traffic aware routing,Admission Control.The network layer in the Internet-The IP Version 4 Protocol, IP Address, IP Version 6,Internet Control Protocol, The Interior Gateway Routing Protocol: OSPF,The Exterior Gateway Routing Protocol: BGP		436-485
UNIT 4[10 HOURS]		
The Transport Layer: The Transport Service-Services Provided to the Upper Layers.Elements of Transport Protocols-Addressing, Connection Establishment, connection Release, Error control and Flow Control.The Internet Transport Protocols-(TCP and UDP)-UDP-Introduction to UDP, Remote Procedure Call, Real-Time Transport Protocols, TCP- Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, TCP Connection Management Modeling, TCP Sliding Window, The Application Layer: DNS – Domain Name System-The DNS Name Space, Domain Resource Records, Name Servers.Electronic Mail-Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery, The Word Wide Web- Architectural Overview,Static Web Pages, Dynamic Web Pages and Web Applications, HTTP—The HyperText Transfer Protocol.	Chapter 6 Chapter 7	495-497, 507-527 541-568 611-693

Text Book

1. Computer Networks, Andrew S. Tanenbaum, 5th Edition, Pearson Education, 2010.

References:

1. Data Communication & Networking, Behrouza A Forouzan, 3rd Edition, Tata McGraw Hill,2001.
2. Data and Computer Communications, William Stallings, 10th Edition, Pearson Education, 2017.
3. Data Communication and Computer Networks, Brijendra Singh, 3rd Edition, PHI, 2012.
4. Data Communication & Network, Dr. Prasad, Wiley Dreamtech.
5. http://highered.mheducation.com/sites/0072967757/index.htmls

Course Title: DBMS Lab	Course code:
Total Contact Hours: 52	Course Credits:02
Formative Assessment Marks: 25	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 25	

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.

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
=========================================================
```

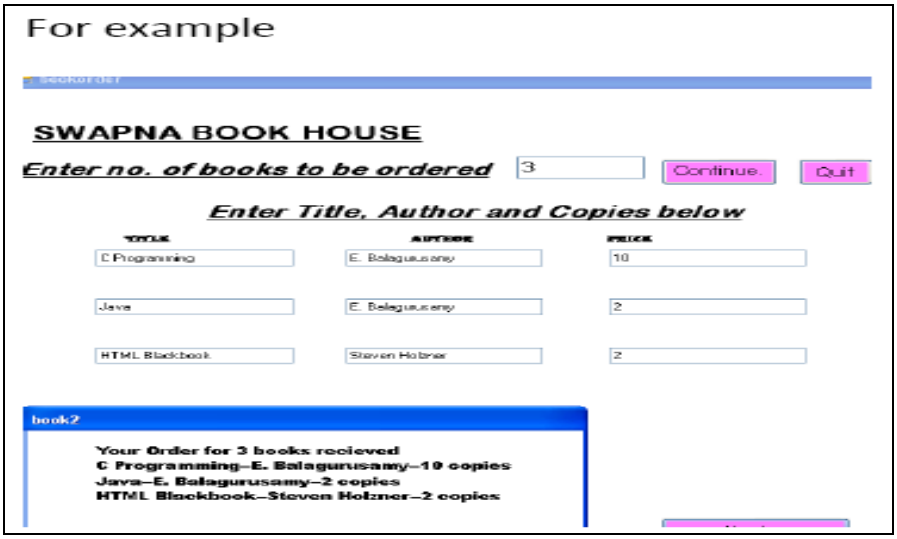
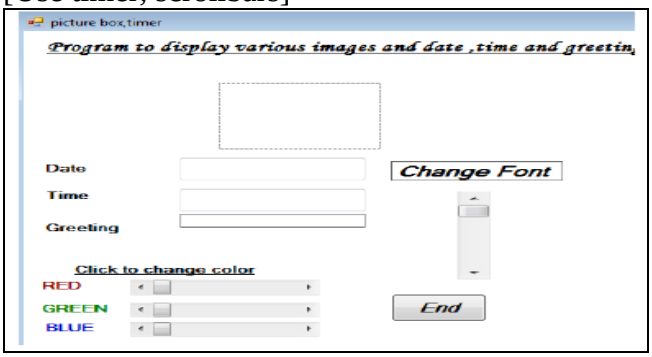
7. Given the following tables:
ITEM_MASTER(itemno, name, stock, unit_price) [Apply the Primary key and check constraint for stock and price as >0] [Insert 5 records]
ITEM_TRANS(itemno, quantity and trans_date)
Create a **package** PCK_ITEM includes a function CHK_ITEM and a procedure PROC_ITEM.
Function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

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	PART-A Writing:4 Marks Execution:4Marks	8 Marks
Program-2	PART-B Writing:6 Marks Execution:6Marks	12 Marks
Practical Record		05 Marks
Total		25 Marks

Course Title: **C# and Dot Net Framework Lab**	
Total Contact Hours: 52	Course Credits:02
Formative Assessment Marks: 25	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 25	

Sl.No	**Program Name**
1.	Design a VB form to accept number of books to be ordered to a shop in a textbox. By clicking a button 'Continue', if accepted number is > 0, then place required number of textboxes on the form to accept the details Title, Author and Copies, during run time to accept details of specified number of books. By clicking a button 'Next' on this form, enabling progression bar, send the details to another form to show the summary of the books ordered. For example 
2.	Design a VB interface containing a. A picture box whose picture should be changed every 5 second (use 5 pictures). b. Textboxes to display date & time and day greeting based on time. Time has to be changed every second automatically. c. Use scrollbars to change font size and background color (RGB) of the textbox that shows greeting. [Use timer, scrollbars] 

3.	Design a VB interface to add, remove, search and clear the items in a combo box. The item name to be added, removed or searched can be accepted through input box. Use a general procedure to find the existence of item before deleting or while searching.
4.	Write a VB program find GCD and LCM of two number.. Accept input through textbox and display the results in label. Also validate for invalid input such as empty input, nonnumeric and negative integer.
5.	Write a Program in C# to checka number if it is Prime; otherwise display the factor of that number.
6.	Write a Program in C#define a Class "Salary" which will contain member variable Emp_no,Emp_name,Dob Basic Write a program using constructor. And method to calculate the DA, HRA, PF, IT, GROSS and NETPAY using appropriate condition. If Basic <= 20000 D.A is 40% Basic H.R.A is 10% Basic. P.F 12% of Gross; PT is Rs .100 If Basic.> 20000 D.A is 50% Basic. H.R.A 15% Basic. P.F 12% of Gross ; PT is Rs.150 Gross = Basic.+D.A +HRA and Net = Gross -PT –PF
7.	Write a Program in C# to find addition and Multiplication operation on two complex number using operator overloading.
	PART-B
1.	Design a website for shopping.(ASP.net) i. The format of shopping page is show below.  • Include many items in item list. When any item is selected, its price must be shown automatically. • Do the following validations also. Customer no and Quantity should not be blank and must contain numeric value. On clicking 'purchase', Add the information customer no, item selected, price and quantity to a database for each purchase and show the following.

Purchased Item

item no :2 item name :Mouse Rate.....:300 qty.....:1

In this on clicking 'Next Purchase' , goto the home page for the selection of next item. On clicking 'Show bill' bill must be produced as follows only for the current customer.

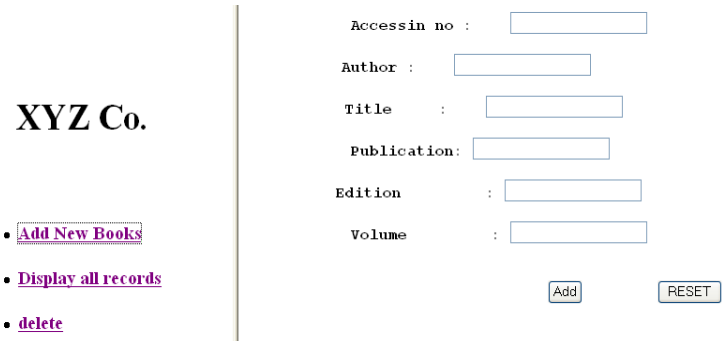
customer no :2
Customer Name :xdsfvcd
Address :dsfs

Item	Rate	Qty	Price
Keyboard	400	2	800
Mouse	300	1	300
		Total Amount	:Rs.1100

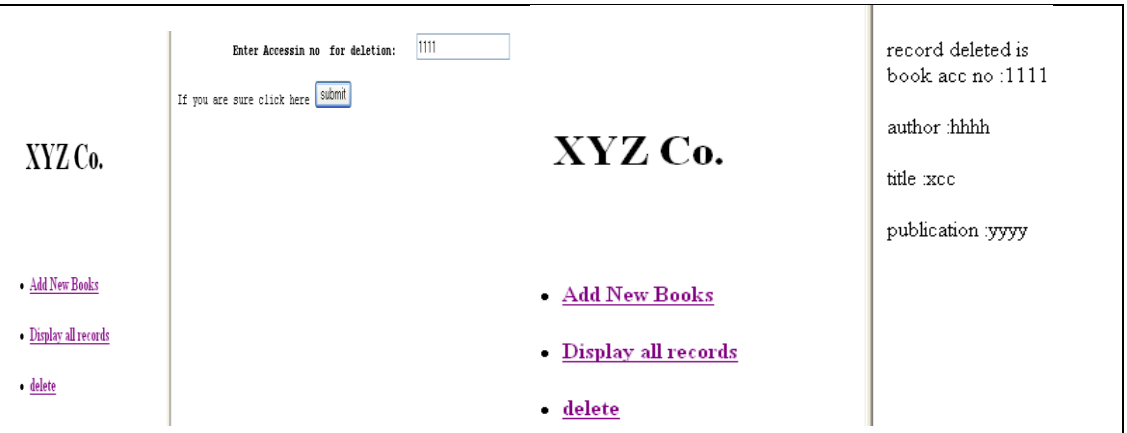
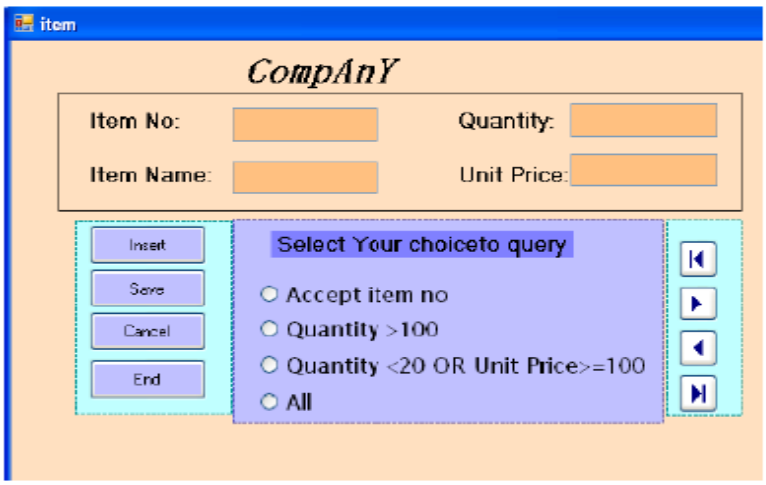
2 **Design a we**bpage (ASP.net)to enter Book information in a library such as Acc.no, Author , Title , publication, Volume, Edition. Use the following buttons for,

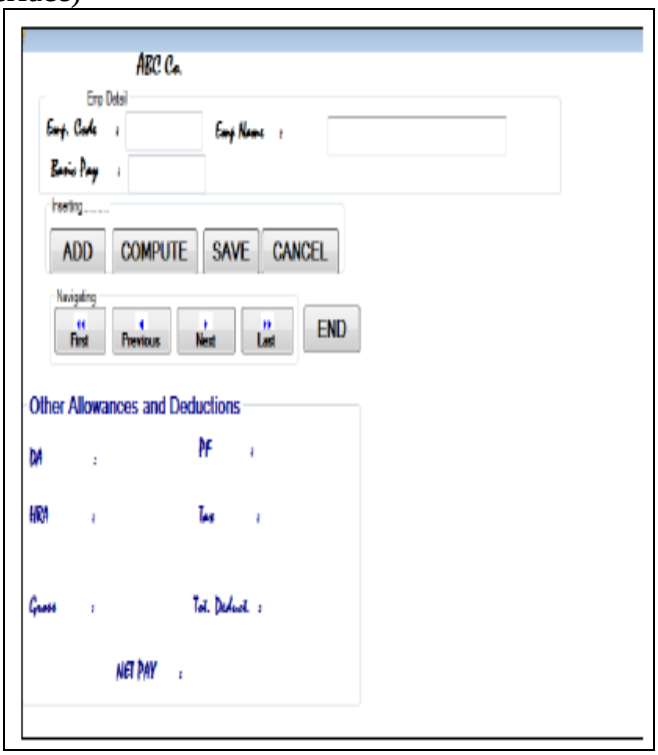
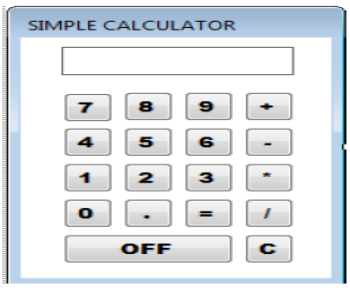
- Add -> for adding the record to the database (Insert at least 5 records).
- Display All -> for displaying all the records from the database
- Delete outdated Book -> To delete a outdated book by specifying accession no.

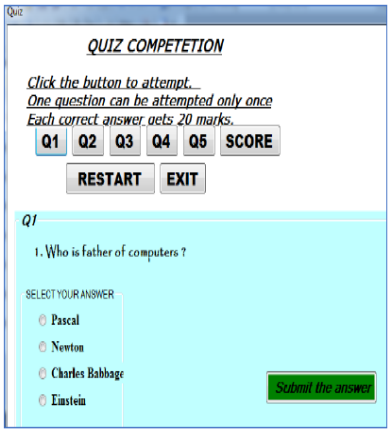
HINT :

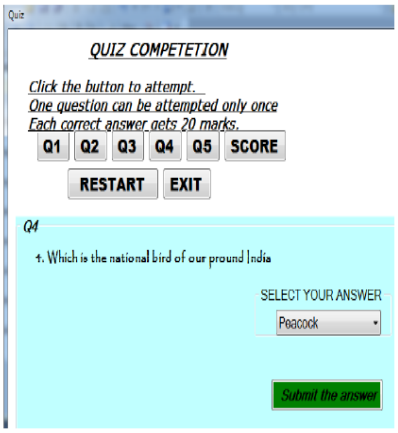


- When Display Record is clicked, show all the records in tabular format in the second frame.
- When **delete** is clicked. Check for non availability of the record.

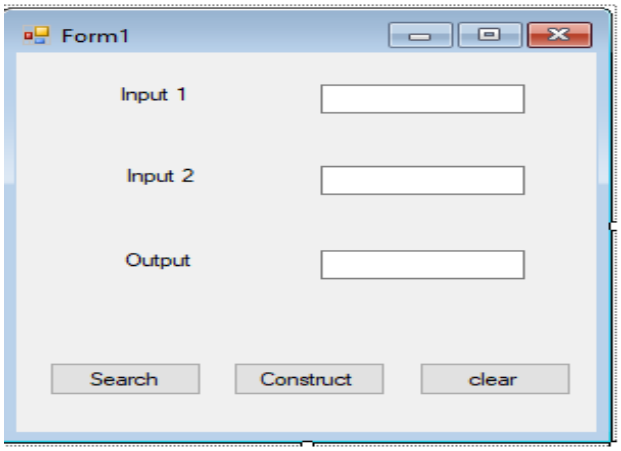
	
3.	Create a table item contains Item no, name, quantity in stock and unit price. Design a VB interface to enter the records and save to the table. Apply the validation rule for quantity and price for +ve numbers and non-zero. Use the command buttons to navigate (first, next, prev, last) through the records depending on search criteria. Searching can be i) By accepting item no. ii) Only the items with quantities>100 iii) Items either quantity less than 20 or unit price>=100 iv) To view all. While viewing it, should not be editable. 
4.	Create a table EMP with Empcode, Name, Basic pay, DA, HRA, PF, Gross, Tax and Netpay. Set up a data entry form to input Empcode, name and salary. Other allowances should be calculated and to be shown on the form which cannot be modifiable. Use the command button for adding, saving, computing and various navigation (first, next, previous, last). While adding, new record Empcode should be incremented automatically by 1 from last record. i) All data are necessary while saving. ii) Basic pay should be +ve integer. iii) While navigating, if the control goes beyond beginning or end of the file, display error message. iv) DA is 40% of Basic pay if Basic pay > 20000, otherwise 30% of Basic pay.

	v) HRA is 10% of Basic pay. vi) PF is minimum of 12% of Gross or Rs.780. vii) Professional Tax is 10% of Gross. viii) Net pay = Gross – (PF + PT) (Using VB interface) 
5.	Design a simple calculator using VB interface perform addition, multiplication, subtraction and division. It should contain buttons for digits 0-9, clear, dot, =, +, –, *, /. Apply the validation rules to avoid entering dot more than once in a number and using – symbol between the digits. Symbol '–' can be used as operator as well as for negative numbers. Any operand can be negative. "Division by zero" to be displayed if divisor is 0. 
6.	Design VB interface to conduct simple multiple choice Quiz with at least 5 questions. For selecting the answers, use combo box and radio buttons for few questions. One question can be answered only once. Show the total score through the message box whenever the user wishes to see his score in between the competition. Any question can be attempted randomly. Design can be as shown below.





7



Create a ASP .NET web application with the above interface and if user clicks on "Search" button then following operation has to be done,

From the Given two strings (from input1 and input2), return a new string, following the rules given below.

If string b occurs in string a, then the new string should concatenate the characters that appear before and after of String b.Ignore cases where there is no character before or after the word, and a character may be included twice if it is in between two string b's.

Example1)

i/p) abcdefcdhycd,cd

o/p) befhy

Example2)

i/p) kumarkumar,kum

o/p) ara

If user clicks on "Construct" button then following operation has to be performed from Given two strings print a new string which is made of the following combination-first character of a, the first character of b, second character of a, second character of b and so on. Any characters left will go to the end of the result.

Example1)

i/p:Hello,World

o/p:Hweolrllod

in both the operation output should be displayed in output text box and clear button should clear all the text boxes.

Evaluation Scheme for Lab Examination:

Assessment Criteria		
Program-1	PART-A Writing:4 Marks Execution:4Marks	8 Marks
Program-2	PART-B Writing:6 Marks Execution:6Marks	12 Marks
Practical Record		05 Marks
Total		25 Marks

Skill Enhancement Course: SEC for other Programmes

Course Title: Artificial Intelligence	Course Credits: 2
Total Contact Hours: 13 hours of theory and 26 hours of practical	Duration of ESA: 01 Hour
Formative Assessment Marks: 20 marks	Summative Assessment Marks: 30 marks

Contents	Chapter No	Page No/Section
Unit-1		
Overview of AI: Definition of Artificial Intelligence, Philosophy of AI, Goals of AI, Elements of AI system, Programming a computer without and with AI, AI Techniques, History of AI. **Intelligent Systems:** Definition and understanding of Intelligence, Types of Intelligence, Human Intelligence vs Machine Intelligence.	**Chapter-1** **Chapter-2**	**FULL** **FULL**
Unit-2		
AI Applications: Virtual assistance, Travel and Navigation, Education and Healthcare, Optical character recognition, E-commerce and mobile payment systems, Image based search and photo editing. **AI Examples in daily life:** Installation of AI apps and instructions to use AI apps.	**Chapter-3** **Chapter-4**	**FULL** **FULL**
Unit-3		
Robotics: Introduction to Robotics, Difference in Robot System and Other AI Program, Components of a Robot.	**Chapter-9**	**FULL**
Laboratory Activities: • **Amazon Alexa:** https://play.google.com/store/apps/details?id=com.amazon.dee.app&hl=en&gl=US • **Google Lens:** https://play.google.com/store/search?q=google+lens&c=apps&hl=en&gl=US • **Image to Text to Speech ML OCR:**https://play.google.com/store/apps/details?id=com.mlscanner.image.text.speech& hl=en_IN&gl=US • **Google Pay:** https://play.google.com/store/apps/details?id=com.google.android.apps.nbu.paisa.user&hl=en_IN&gl=US •**Grammarly:** https://play.google.com/store/search?q=grammarly&c=apps&hl=en_IN&gl= • **Google Map:** https://play.google.com/store/search?q=google+maps&c=apps&hl=en&gl=US •**FaceApp:** https://play.google.com/store/apps/details?id=io.faceapp&hl=en_IN&gl=US • **Socratic:**		**26**

https://play.google.com/store/apps/details?id=com.google.socratic&hl=en_IN&gl=US • **Google Fit: Activity Tracking:**https://play.google.com/store/apps/details?id=com.google.android.apps.fitness&h l=en_IN&gl=US • **SwiftKey Keyboard:** https://swiftkey-keyboard.en.uptodown.com/android • **E-commerce App:** https://play.google.com/store/apps/details?id=com.jpl.jiomart&hl=en_IN&gl=US	

Text Books:

1. Wolfgang Ertel, "Introduction to Artificial Intelligence", 2nd Edition, Springer International Publishing 2017.
2. https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_tutorial.pdf

References:

1. Kevin Knight, Elaine Rich, Shivashankar B. Nair, "Artificial Intelligence", 3rd Edition, July 2017.
2. Michael Negnevitsky, "Artificial Intelligence A Guide to Intelligent Systems", 2nd Edition, Pearson Education Limited 2005.

Reference Links:

1. Voice Assistant: https://alan.app/blog/voiceassistant-2/
2. Browse with image: https://www.pocket-lint.com/apps/news/google/141075-what-isgoogle-lens-and-how-does-it-work-and-which-devices-have-it
3. OCR: https://aws.amazon.com/what-is/ocr/
4. Mobile Payment system: https://gocardless.com/en-us/guides/posts/how-do-mobilepayment-systems-work/
5. Grammarly: https://techjury.net/blog/how-to-use-grammarly/#gref
6. Travel & Navigation: https://blog.google/products/maps/google-maps-101-ai-powernew-features-io-2021/
7. AI in photo editing: https://digital-photography-school.com/artificial-intelligencechanged-photo-editing/
8. AI in education: https://www.makeuseof.com/what-is-google-socratic-how-does-itwork/
9. AI in health and fitness: https://cubettech.com/resources/blog/implementing-machinelearning-and-ai-in-health-and-fitness/
10. E-commerce and online shopping: https://medium.com/@nyxonedigital/importanceof-e-commerce-and-online-shopping-and-why-to-sell-online-5a3fd8e6f416

Open Source Tools

(Skill Enhancement Course: SEC for BCA Course)

Semester: III

Course Title: Open Source Tools	Course Credits: 2 (1L+0T+2P)
Semester: III	Duration of SEE: 01 Hour
Total Contact Hours: 13 hours of theory and 26-28 hours of practicals	SEE: 30 Marks IA: 20 Marks

Course Content (Open Source Tools)

Module	Details of topic	Chapter	Duration
Module 1: Open Source Software's	i. Introduction to Open sources, Need of Open Sources, Open Source –Principles, Standard Requirements, Advantages of Open Sources – ii. Free Software – FOSS iii. Licenses – GPL, LGPL, Copyrights, Patents, Contracts & Licenses and Related Issues iv. Application of Open Sources. Open Source Operating Systems : FEDORA, UBUNTU	Chapter-1	P-No-1-21
Module 2: Programming Tools And Techniques	i. Usage of design Tools like Argo UML or equivalent ii. Version Control Systems like Git or equivalent iii. Bug Tracking Systems (Trac, BugZilla) iv. BootStrap	Chapter-2	P-No:22-70
Module 3: Case Studies	i. Apache ii. Berkeley Software Distribution iii. Mozilla (Firefox) iv. Wikipedia v. Joomla vi. GNU Compiler Collection vii. Libre Office	Chapter-3	Page-No:71-128

Text Book:

1. KailashVadera, Bhavyesh Gandhi, "Open Source Technology", Laxmi Publications Pvt. Ltd 2012, 1st Edition.

Reference Book:

1. Fadi P. Deek and James A. M. McHugh, "Open Source: Technology and Policy", Cambridge Universities Press 2007.

Open Elective for III Semester : Programming in C Concepts

Course Title: **Programming in C** Concepts	Course Credits: 3 (3L+0T+0P)
Semester: III	Duration of SEE: 03 Hour
Total Contact Hours: 42	SEE: 60 Marks IA: 40 Marks
Course Title: **ProgramminginC** Concepts	Course Credits: 3 (3L+0T+0P)

Topics	**Chapter No**	**Page No/Section**
UNIT 1[11 HOURS]		
OverviewofC: History of Importance of CProgram, Basic structure of aC-program, Execution of CProgram **Cprogramming Basic Concepts:**Characterset,Ctoken,Keywords and identifiers,Constants,Variables,datatypes,Declaration of variables,assigning values to variables,defining symbolic constants.	BOOK 1 CHAPTER 1 CHAPTER 2	1.1To 1.10(page no 1 to 15) 2.1 to 2.11(page no23 to 44)
UNIT 2[11 HOURS]		
Input and output with C: Formatted I/O functions –*printf*and *scanf,* control stings and escape sequences,output specifications with *printf* functions;Unformatted I/O functions to read and displaysing character and astring-*getchar,putchar,gets*and*puts*functions **Operators & Expressions:** Arithmetic operators; Relational operators;Logical operators;Assignmentoperators; Increment & Decrement operators; Bitwise operators; Conditional operator;Operator Precedence and Associatively;Evaluation of arithmetic expressions;	CHAPTER 4 CHAPTER 3	4.1 to 4.5(page no 84 to 106) 3.1 to 3.16 exclude3.13 3.16(page no 52 to 74)
UNIT 3[10 HOURS]		
Control Structures: **Decision Making and Branching** -Decision making with if statement, simple ifstatement,the ifelse statement,nesting of if…elsestatements,the elseif ladder,the switch statement,the ?: operator, the go to statement. **Decision making and looping** - The while statement, the do statement, for statement,	CHAPTER 5	5.1 to 5.9(page no 114 to 138)

nested loops, exit, break, jumps in loops.	CHAPTER 6	6.1 to 6.5(page no 152 to 174)
UNIT 4[10 HOURS]		
Derived datatypes inC: Arrays-declaration, initialization and access of one-dimensional and two-dimensional arrays. **Handling of Strings:** Declaring and initializing string variables, reading strings from terminal, writing strings to screen,Arithmetic operations on characters,String handling functions - *strlen, strcmp, strcpy, strstr and strcat;* **Character handling functions -***toascii,toupper, tolower, isalpha, isdigit*,isspace,islower,isupper, **Functions**:Basics of function-Elements of user – defined functions,Definition of functions,return values and their types,function calls,function declaration **File handling** :Introduction,defining and opening a file,closing a file,INPUT/OUTPUT operation on files-the fprintf and fscanf functions	CHAPTER 7 CHAPTER 8 BOOK 2 CHAPTER 14 BOOK 1 BOOK 1	7.1 to 7.6(page no 190 to 207) 8.1 to ,8.8 (page no 229 to 249) Page no 355,358,359,360,362,381,382, 9.1 TO 9.8(Page no-262-274) 12.1 to 12.4(page no 389 -398)

Text Books:

1. E.Balagurusamy,ProgramminginANSIC,7th Edition,TataMcGrawHill
2. HerbertScheldt,C: TheCompleteReference,4th Edition.

References

1. Brain W.kernighan,C programming Language,2nd Edition,Prentice Hall Sofware.
2. Kernighan & Ritchie: The C Programming Language, 2nd Edition, PHI
3. Kamathane , Prpgramming with ANSI and TURBO C, Pearson Education
4. V .Rajaraman, Computer Programming in C,2nd Edition, PHI

Open Elective for III Semester

R PROGRAMMING

Course Title**: R PROGRAMMING**	Course Credits: 3 (3L+0T+0P)
Semester: III	Duration of SEE: 03 Hour
Total Contact Hours: 42	SEE: 60 Marks IA: 40 Marks

Contents	Chapter No
Unit-1	
Introduction to R: What is R? – Why R? – Advantages of R over Other Programming Languages - R Studio: R command Prompt, R script file, comments – Handling Packages in R: Installing a R Package, Few commands to get started:installed.packages(), package Description(), help(), find. Package (), library() - Input and Output – Entering Data from keyboard – Printing fewer digits or more digits – Special Values functions : NA, Inf and –inf. **R Data Types**: Vectors, Lists, Matrices, Arrays, Factors, Data Frame **R - Variables**: Variable assignment, Data types of Variable, Finding Variable ls(), Deleting Variables.	Book1-Chapter-1 Book-2 **Chapter-1** **Chapter-2** **Chapter-3** **Chapter-4** **Chapter-5**
Unit-2	
R Operators: Arithmetic Operators, Relational Operators, Logical Operator, Assignment Operators, Miscellaneous Operators **R Decision Making**: if statement, if – else statement, if – else if statement, switch statement **R Loops**: repeat loop, while loop, for loop - Loop control statement: break statement, next statement. **R-Function** : function definition, Built in functions: mean(), paste(), sum(), min(), max(), seq(), user-defined function, calling a function, calling a function without an argument, calling a function with argument values **R-Strings** – Manipulating Text in Data: substr(), strsplit(), paste(), grep(), toupper(), tolower() **R Vectors** – Sequence vector, rep function, vector access, vector names, vector math, vector recycling, vector element sorting **R List** - Creating a List, List Tags and Values, Add/Delete Element to or from a List, Size of List, Merging Lists, Converting List to Vector **R Matrices** – Accessing Elements of a Matrix, Matrix Computations: Addition, subtraction, Multiplication and Division	Book-2 **Chapter-6** **Chapter-7** **Chapter-8** **Chapter-9** **Chapter-10** **Chapter-11** **Chapter-12** **Chapter-13**
Unit-3	
R Arrays: Naming Columns and Rows, Accessing Array Elements, Manipulating Array Elements, Calculation Across Array Elements **R Factors** –creating factors, generating factor levels gl(). **Data Frames** –Create Data Frame, Data Frame Access, Understanding Data in Data Frames: dim(), nrow(), ncol(), str(), Summary(), names(), head(), tail(), edit() functions - Extract Data from Data Frame **Expand Data Frame**: Add Column, Add Row - Joining columns and rows in a Data frame rbind() and cbind() – Merging Data frames merge() – Melting and Casting data melt(), cast().	Book-2 Chapter-14 Chapter15 Chapter-16 Chapter-17 Chapter-18 Chapter-11

Unit-4	
Loading and handling Data in R: **Getting and Setting the Working Directory** – getwd(), setwd(), dir() **R-CSV Files** - Input as a CSV file, Reading a CSV File, Analyzing the CSV File: summary(), min(), max(), range(), mean(), median(), apply() - Writing into a CSV File **R -Excel File** – Reading the Excel file.	Book-1 2.2 Book-1 **Chapter-19** **Chapter-20** **Chapter-21**

Text Book

1. Seema Acharya, Data Analytics using R, McGrawHill Education (India), 2018, ISBN: 978-93-5260-524-8.
2. Tutorials Point (I) simply easy learning, Online Tutorial Library (2018), R Programming, Retrieved from https://www.tutorialspoint.com/r/r_tutorial.pdf.

Referencess

3. Andrie de Vries, JorisMeys, R for Dummies A Wiley Brand, 2nd Edition, John Wiley and Sons, Inc, 2015, ISBN: 978-1-119-05580-8.

4. SandipRakshit, R Programming for Beginners, McGraw Hill Education (India), 2017, ISBN : 978-93-5260-455-5.