AMITY INSTITUTE OF INFORMATION TECHNOLOGY
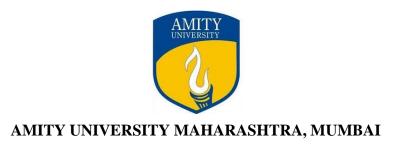
B.Sc.- Information Technology
B.Sc.- IT

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AMITY UNIVERSITY MAHARASHTRA, MUMBAI

Programme Structure
Curriculum & Scheme of Examination
2020

First Year 2020-21
Second Year 2021-22
Third Year 2022-23

Sem 1	Sl. No.	Course Title	(L) Hours Per Week	(T) Hours Per Week	(P) Hours Per Week	Total Credits
		Core Courses				
	IFT2101	Operating Systems	3	0	0	3
	IFT2102	Operating Systems Lab (Unix)	0	0	2	1
	IFT2103	Web Technologies	2	0	0	2
	IFT2104	Digital Electronics	2	0	0	2
	IFT2105	Mathematics Paper 1	3	0	0	3
	IFT2106	Web Technologies Lab	0	0	2	1
	IFT2107	C++ Programming	3	0	0	3
	IFT2108	C++ Programming Lab	0	0	2	1
		Value enhancement Courses (04 Credits)				
	ENV2151	EVS-1	2	0	0	2
	CSS2151	Communication Skills	1	0	0	1
	BEH2151	Behavioral Science	1	0	0	1
		Open Electives (06 Credits)				
		*Minor Track	3	0	0	3
	LAN2151 LAN2152 LAN2153	Foreign Language-I* French-I German-I Spanish-I	3	0	0	3
					Total Credits	26

Sem 2	Sl. No.	Course Title	(L) Hours Per Week	(T) Hours Per Week	(P) Hours Per Week	Total Credits
		Core Courses				
	IFT2201	Mathematics Paper-2	**3**	**0**	**0**	**3**
	IFT2202	Computer Networks	3	0	0	3
	IFT2203	Database Management Systems	2	0	0	2
	IFT2204	Data Structures using C++	3	0	2	4
	IFT2205	Python Programming	2	0	2	3
	IFT2206	Computer Architecture	3	0	0	3
	IFT2207	Computer Networks Lab	0	0	2	1
	IFT2208	DBMS Lab	0	0	2	1
	IFT2209	Data Structures using C++ Lab	0	0	2	1
	IFT2210	Python Programming Lab	0	0	2	1
		Value enhancement Courses (04 Credits)				
	ENV2152	Environmental Studies-II*	2	0	0	2
	CSS2251	Presentation Skills*	1	0	0	1
	BEH2251	Problem Solving & Creative Thinking*	1	0	0	1
		Open Electives (06 Credits)				
	14	*Minor Track	3	0	0	3
	15	Foreign Language	3	0	0	3
					Total	30

Sem 3	Sl. No.	Course Title	(L) Hours Per Week	(T) Hours Per Week	(P) Hours Per Week	Total Credits
		Core Courses				
	IFT2301	Software Engineering & UML	3	0	0	3
	IFT2302	UI/UX Design	2	0	0	2
	IFT2303	Java Programming	3	0	0	3
	IFT2304	Introduction to Machine Learning	2	0	0	2
	IFT2305	Oracle DBA	2	0	0	2
	IFT2306	Introduction to Bigdata	2	0	0	2
	IFT2307	UI/UX Design Lab	0	0	2	1
	IFT2308	Java Programming Lab	0	0	2	1
	IFT2309	Introduction to Machine Learning Lab	0	0	2	1
	IFT2310	Oracle DBA Lab	0	0	2	1
	IFT2311	Introduction to Bigdata Lab	0	0	2	1
		Open Electives				
	12	Minor Track	3	0	0	3
	13	Foreign Language	2	0	0	2
		Value enhancement Courses				
	CSS2351	Reading & Comprehension	1	0	0	1
	BEH2351	Group Dynamics and Team Building	1	0	0	1
		Concentration Elective for 3 Credits				
	IFT2312	Advanced Technologies in Computer Science (Open)	2	0	2	3
	IFT2313	Term Paper	3	0	0	3
	IFT2314	Embedded Systems	2	0	2	3
					Total	29

Sem 4	Sl. No.	Course Title	(L) Hours Per Week	(T) Hours Per Week	(P) Hours Per Week	Total Credits
		Core Courses				
	IFT2401	Introduction to DevOps	2	0	0	2
	IFT2402	Android Programming	2	0	0	2
	IFT2403	Hadoop Administration	2	0	0	2
	IFT2404	Advanced Networking Concepts	2	0	0	2
	IFT2405	Cyber Foreignsic	2	0	0	2
	IFT2406	Introduction to DevOps Lab	0	0	2	1
	IFT2407	Android Programming Lab	0	0	2	1
	IFT2408	Hadoop Administration Lab	0	0	2	1
	IFT2409	Advanced Networking Concepts Lab	0	0	2	1
	IFT2410	Cyber Foreignsic Lab	0	0	2	1
		Open Electives				
	11	Minor Track	3	0	0	3
	12	Foreign Language	2	0	0	2
		Value enhancement Courses				
	CSS2451	Corporate Communication	1	0	0	1
	BEH2451	Stress and Coping Strategies	1	0	0	1
		Concentration Elective for 3 Credits				
	IFT2411	Cloud Computing (Azure / AWS)	2	0	2	3
	IFT2412	Study Abroad (12 Days)	0	0	0	3
	IFT2413	Project (Presentation & Evaluation)	0	0	0	3
	IFT2414	Open Source Technologies (PHP & MySQL)	2	0	2	3
					Total	25

Sem 5	Sl. No.	Course Title	(L) Hours Per Week	(T) Hours Per Week	(P) Hours Per Week	Total Credits
		Core Courses				
	IFT2501	ASP.NET with C# Programming	3	0	0	3
	IFT2502	Digital Image Processing	2	0	0	2
	IFT2503	Advanced DevOps Concepts	2	0	0	2
	IFT2504	Business Intelligence(SQL Server SSIS)	2	0	0	2
	IFT2505	Blockchain Architecture	2	0	0	2
	IFT2506	Summer Project Evaluation	0	0	0	3
	IFT2507	ASP.NET with C# Programming Lab	0	0	2	1
	IFT2508	Digital Image Processing Lab	0	0	2	1
	IFT2509	Advanced DevOps Concepts Lab	0	0	2	1
	IFT2510	Business Intelligence(SQL Server SSIS) Lab	0	0	2	1
	IFT2511	Blockchain Architecture Lab	0	0	2	1
		Open Electives				
	12	Minor Track	3	0	0	3

13	Foreign Language	2	0	0	2
Value enhancement Courses					
CSS2551	Employability Skills	1	0	0	1
BEH2551	Individual Society & Nations	1	0	0	1
Concentration Elective for 3 Credits					
IFT2512	Introduction to Internet of Things	2	0	2	3
IFT2513	Computer Graphics	2	0	2	3
IFT2514	R Programming	2	0	2	3
				Total	26

Sem 6	Sl. No.	Course Title	(L) Hours Per Week	(T) Hours Per Week	(P) Hours Per Week	Total Credits
Core Courses						
	IFT2601	Multimedia Technologies	2	0	0	2
	IFT2602	Digital Marketing & SEO Optimization	2	0	0	2
	IFT2603	Information Security and Cyber Laws	2	0	0	2
	IFT2604	Project / Dissertation	0	0	0	5
	IFT2605	Multimedia Technologies Lab	0	0	2	1
	IFT2606	Digital Marketing & SEO Optimization Lab	0	0	2	1
	IFT2607	Information Security and Cyber Laws Lab	0	0	2	1
Open Electives						
	8	Minor Track	3	0	0	3
Value enhancement Courses						
	CSS2651	Workplace Communication	1	0	0	1
	BEH2651	Interpersonal Communication and Relationship Management	1	0	0	1
Concentration Elective for 3 Credits						
	IFT2608	Matlab / Scilab Programming	2	0	2	3
	IFT2609	SQL Server & Non-Relational DBA	2	0	2	3
	IFT2610	Augmented / Virtual Reality	2	0	2	3
					Total	22

*Minor Track can be any one from the given list.

1. Business Management
2. Human Rights
3. Animation
4. English Literature

5. Photography
6. Tourism Management
7. Film Appreciation
8. Social Work
9. Political Science
10. Economics
11. Fine Arts
12. Industrial Safety & Resource Management
13. Fashion Technology

Foreign Language any one from the given list

1. German
2. French
3. Spanish

Course Code: IFT2101		Course Title: Operating Systems				
Total Credits	3	Theory	3	Tutorial	0	

Module Number	Topics	No Hrs.
1	**Introduction** Operating system: Definition, Evolution and types of Operating Systems, Functions and Components or Structure of Operating Systems: Process management, memory management, Storage Management, Protection and Security, Special Purpose Systems, Computing Environment. System Structure: Services, System calls & Types, System programs	7
2	**Processes Management** Process concept, State model, Process scheduling, Threads CPU Scheduling**:** Job scheduling functions, Process scheduling, Scheduling Algorithms, Non Preemptive and preemptive Strategies, Algorithm Evaluation, Multiprocessor Scheduling. Inter-process Communication and Synchronization**:**Inter Process Communication,Principle of Concurrency, Producer Consumer Problem, Critical Section problem, Semaphores. Deadlock**:** System Deadlock Model, Deadlock Characterization, Methods for handling deadlock, Prevention strategies, Avoidance and Detection, Recovery from deadlock combined approach	15
3	**Memory Management** Memory Management Strategies: Contiguous Memory Allocation, Paging, Segmentation Virtual memory Management: Concept, Demand paging, Performance, Paged replacement algorithm, Allocation of frames, Thrashing, Cache memory, Swapping, Overlays.	10
4	**Device & Information Management** Principles of I/O hardware, Device controller, Device Drivers, Memory mapped I/O, Direct Access Memory, Interrupts, Interrupt Handlers, Buffering, Caching, Spooling,Disk organization, Disk space management, Disk allocation Method, Disk Scheduling, Disk storage. File Concept, Access Methods, Directory & Disk Structure, File System Structure, File System & Directory Implementation, Allocation Methods, Free Space Management	6
5	**The Unix System Case Study** History, Design Principle, Programmer Interface, User Interface, Process Management,Memory Managements, File management, Inter-process Communication.	6

Text & Reference Books	
1	Operating Systems Concepts, Silberschatz Galvin, Eighth Edition Addition Wesley Publication.
2	Modern Operating Systems, A S Tanenbaum, Prentice Hall of India New Delhi.
3	Operating Systems Internals & Design Principles , William Stallings ,Prentice Hall, Seventh Edition
4	Design of UNIX Operating System, Maurice J. Bauch, Prentice Hall of India.
Online Resources	
1	

Lab Course Code: IFT2102	Lab work Course Title: Operating System Lab	
Total Credits	1	Practical : 2 Hrs per Week	Tutorial: 00

Assignment Number	Topics	No Hrs.
1	General Purpose Utility Commands	2
2	File System and Files Commands	2
3	Working with vi Editor	2

4	Shell Programming :
	
	Shell Program 1: Write a shell script to generate a multiplication table.
	
	   a) Interactive version: The program should accept an integer n given by the user and should print the multiplication table of that n.
	   b) Command line arguments version: The program should take the value of n from the arguments followed by the command.
	   c) Redirection version: The value of n must be taken from a file using input redirection.
	
	Shell Program 2: Write a shell script that adds, subtracts, multiplies and divides the two given numbers.
	   a) Interactive version: The program should accept two integersand the operation to be carried out from the user. Develop two versions of the program, one by using if and other using case construct.
	   b) Command line arguments version: The program should supply the values of the integers from the command line arguments.
	
	Shell Program 3: Write a Shell Script which takes a command line argument of kms and by default converts that number into meters. Also provide options to convert km to dm and km tocm.
	
	Shell Program 4: Write a shell script to calculate sum of the digits of a three digit number.
	
	   a) Interactive version: The program should accept the three digit numberfrom the user.
	   b) Command line arguments version: The program should supply the three digit number from the command line arguments.
		2

5	Shell Programming
	
	Shell Program 5: Write a Shell Script that performs and displays a count-down either from 10 (default) or from the value that is entered by theuser.
	
	Shell Program 6: Write a shell script that finds the value of one integer raised to the power of another.
	
	   a) Interactive version: The program should accept two integers from the user.
	   b) Command line arguments version: The program should supply the values of the integers from the command line arguments.
		2

		Shell Program 7:Write a shell script to print first n terms of Fibonacci series
		
		   a) Interactive version: The program should accept thenumber of terms to be printed from the user, interactively.
		   b) Command line arguments version: The program should supply the values of the number of terms to be printed from the command line arguments.	

6	Shell Programming		2

	Shell Program 8: Write a shell script to print the GCD and LCM of two numbers
	
	   a) Interactive version: The program should accept thetwo numbers from the user, interactively.
	   b) Command line arguments version: The program should supply the two numbers from the command line arguments.
	
	Shell Program 9: Write a Shell Script that computes the factorial of a givennumber
	
	Shell Program 10: Write a Shell Script which creates the following menu and prompts for choice from user and runs the chosen command.
	   i) Today's Date
	   ii) Process of user
	   iii) List of files
	   iv) Quit UNIX		

7	Shell Programming		2
	Shell Program 11: Write a Shell Script that works like a calendar reminding the user of certain things depending on the day of the week. Shell Program 12: Write a shell script to generate all combinations of 1, 2 and 3 using forloop. Shell Program 13:Write a shell script that prompts the user for the password. The user has maximum of 3 attempts. If the user enters the correct password, the message "Correct Password" is displayed else the message "Wrong Password" gets displayed.		
8	Shell Programming		2
	Shell Program 14: Write a Shell Script using for loop, which displays the message "Welcome to the UNIX Lab". Shell Program 15: Write a Shell Script that receives two filenames as arguments. It should check whether content of the two files is same or not. If they are same, second file should bedeleted. Shell Program 16:Write a Shell Script that takes pattern and filename as command line arguments and displays the results appropriately i.e. pattern found/pattern not found.		
9	Shell Programming		2
	Shell Program 17: Write a Shell Script that accepts a filename as a command line argument and finds out if it's a regular file or a directory. If it's a regular file, then performs various tests to see if it is readable, writeable and executable. Shell Program 18: Write a Shell Script that changes the extension of a group of files from		

	txt to doc.

Shell Program 19: Write a Shell Script which will redirect the output of the date command without the time into a file. | | |
| 10 | Shell Programming | | 2 |
| | Shell Program 20: Write a Shell Script to change the filename of all files in a directory from lower-case to upper- case.

Shell Program 21: Write a Shell Script that examines each file in the current directory. Files whose names end in old are moved to a directory named old files and files whose names end in .c are moved to directory named cprograms.

Shell Program 22: Write a shell script which reports names and sizes of all files in a directory (directory would be supplied as an argument to the shell script) whose size is exceeding 1000 bytes. The filenames should be printed in descending order of their sizes. The total number of such files should also be reported. | | |
| 11 | Shell Programming | | 2 |
| | Shell Program 23: Write a shell script to identify all zero-byte files in the current directory and delete them. Before proceeding with deletion, the shell script should get a conformation from theuser.

Shell Program 24: A shell script receives even number of filenames. Suppose four filenames are supplied, then the first file should get copied into second file, the third file should get copied into fourth and so on. If odd number of filenames is supplied then no copying should take place and an error message should be displayed.

Shell Program 25: Write a Shell Script that accepts only three arguments from the command line. The first argument is the pattern string, the second argument is the filename in which the pattern is to be searches and the third argument is the filename in which the result is to be stored. | | |
| 12 | Shell Programming | | 2 |
| | Shell Program 26: Write a shell script for renaming each file in the directory such that it will have the current shell PID as an extension. The shell script should ensure that the directories do not get renamed.

Shell Program 27: Write a shell script that will receive any number of filenames as arguments. The shell script should check whether such files already exist. If they do, then it should be reported. The files that do not exist should be created in a sub-directory called mydir. The shell script should first check whether the sub-directory mydir exists in the current directory. If it doesn"t exist, then it should be created. If mydir already exists, then it should be reported along with the number of files that are currently present inmydir. | | |

Software & Tools Required	
1	Ubuntu 20.04

Text & Reference Books	
1	Unix Concepts & Applications, Sumitabha Das, Fourth Edition
2	UNIX Shell programming, Stephan G Kochan,Patrick Wood ,Third edition
Online Resources	
1	https://fog.ccsf.edu/~gboyd/cs160b/online/2-basics1/variables.html

Course Code: IFT2103		Course Title: Web Technologies				
Total Credits	2	Theory	2	Tutorial	0	

Module Number	Topics	No Hrs.
1	**Module I: Introduction to html programming** History of HTML, Structure of HTML, Adding Comments, Formatting Text, Creating List, Creating Definition List, Creating Hyper Text Links, Creating Link Lists, Inserting Inline Images, Creating Image Links, Horizontal Rules, Address Tag, Working with Text Changing font Sizes and Colors, Using Background Image, Marquee Tag.	6
2	**Module II** Tables and frames, Creating Tables, Table Element, Adding Border, Adding Column Headings, Adding Spacing and Padding, Adding a Caption, Setting the table Width and Height, Add Row Headings, Aligning Cell contents, Setting Column Width, Centering a Table, Inserting and Image, Spannig Columns, Spanning Rows Assigning Backgroung Colors, Frame Elements, Creation of Frame Based Pages, Noframes Element.	5
3	**Module III** Forms and Java Script Introduction to Forms, Form Elements, Front level validations using JavaScript	5
4	**Module IV** Cascading style sheets, Overview of style sheets, Different ways to use style sheets, Selectors DIV and SPAN Elements, Adding style to a Document, Use id Classes and Ids, Style Sheet Properties.	5
5	**Module V: XML** Introduction to XML, XML Basics, XML Structure, Developing a DTD from XML code, Viewing XML, Viewing XML using the XML Data Source Object, Viewing XML using Style Sheets.	5

Text & Reference Books	
1	Teach Yourself Web Technologies - Part 1, Ivan Bayross, ISBN 8176565369
2	Teach Yourself Web Technologies - Part 2, Ivan Bayross, ISBN 8176565431
3	
1	
2	

Course Code: IFT2104		Course Title: Digital Electronics			
Total Credits	2	Theory	2	Tutorial	0

Module Number	Topics	No Hrs.
1	**Number System:** Decimal, Binary, Octal, Hexadecimal Number Systems and Conversion of the bases. Representation of Data: Signed Magnitude, one's complement and two's complement, **Codes:** BCD, XS-3, Gray code, Hamming code, Alphanumeric codes (ASCII, EBCDIC, UNICODE), Error detecting and Error Correcting codes	6
2	**Boolean Algebra:** Basic gates (AND, OR, NOT gates), Universal gates (NAND and NOR gates), other gates (XOR, XNOR gates). Boolean identities, De Morgan Laws. **Karnaugh Maps:** Sum of Product, Product of Sum, Quine McClusky method.	5
3	**Combinational Circuits:** Half adder, Full adder, Half Subtractor, Full Subtractor, **Combinational circuit design:** Multiplexers and Demultiplexers, Encoders, Decoders, Combinational design using mux and demux.	5
4	**Sequential Circuit Design:** Flip flops (RS, Clocked RS, D, JK, JK Master Slave, T). **Shift registers and their types:** Introduction, parallel and shift registers, serial shifting, serial–in serial– out, serial–in parallel–out , parallel–in parallel–out, Ring counter, Johnson counter. **Counters:** Synchronous and Asynchronous counters	5
5	**Introduction to Memory:** Basic Organisation, Memory: ROM, RAM, PROM, EPROM, EEPROM, Secondary Memory: Hard Disk and optical Disk, Cache Memory, I/O devices	5
	Virtual Lab: 1. Study of Logic gates, their ICs and universal gates. 2. To study basic gates (AND, OR, NOT) and verify their truth tables using Bread Board. 3. Study of Simulator Circuit. 4. Verification and interpretation of truth table for AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates 5. Construction of half/ full adder using XOR and NAND gates and verification of its operation 6. Realization of logic functions with the help of Universal Gates (NAND, NOR) 7. Construction of a NOR gate latch and verification of its operation 8. Verify the truth table of RS, JK, T and D flip-flops using NAND & NOR gates	4

		9. Verify Binary to Gray and Gray to Binary conversion using NAND gates only.	

Text & Reference Books	
1	Modern Digital Electronics by R. P. Jain
2	Digital Principles and Applications by Malvino and Leach, McGrawHill
3	Introduction to Computers by Balagurusamy
Online Resources	
1	http://de-iitr.vlabs.ac.in/List%20of%20experiments.html
2	www.electronics-tutorials.ws

Course Code: IFT2105		Course Title: Mathematics Paper 1				
Total Credits	3	Theory Hrs. Per Week	3	Tutorial	0

Course Objective:
The objective of this course is to provide an introduction to the fundamentals and concepts of basic mathematics covering sets, functions, differentiation, integration, vectors and matrices. This course aims to assist the students to develop confidence in handling mathematical concepts and techniques and to understand the principles and uses of differential and integral calculus.

Module Number	Topics	No Hrs.
1	**Module I: Sets** Sets and subsets, finite and infinite sets. Algebra of sets: Union, Intersection, complementation, Demorgan laws, Common applications of algebra of sets. **Functions:** Interval and sub-intervals. Definition of function and examples, polynomial, rational ,exponential, logarithmic and trigonometric functions. Graph of some simple functions like polynomial (upto 3^{rd}deg), rational, trigonometric functions, modulus, function, step functions, rational functions, composite functions, Limit of a function.	6
2	**Module II: Differentiation** Differentiation of function, Derivative of some common functions, polynomial, rational, exponential, Logarithmic and trigonometric functions. Successive differentiation, Leibnitz theorem.	10
3	**Module III: Integration** Integration as inverse process of differentiation, integration of simple functions, method of change of variable and substitution for integrals, definite integrals, simple problems of line integral.	10
4	**Module IV: Vectors** Vector, Vector Algebra: addition, subtraction, Scalar Multiplication. Magnitude, Vector multiplication, Simple application of Vectors. **Matrices:** Matrix, Submatrix, types of matrices, such as symmetric, square, diagonal matrices, singularand nonsingular matrices. Addition, Subtraction, multiplication of matrices, Rank of matrix, Matrix equation, Solution by Cramer"s rule and Gauss elimination method.	10

	Text & Reference Books
1	*Text:* Engineering Mathematics, E. Kreyig
2	*References:* Higher Engineering Mathematics, B. S. Grewal Differential Calculus, Shanti Narayan
3	
4	

Course Code: IFT2106	Course Title: Web Technologies Lab				
Total Credits	1	Practical Hrs. Per Week	2	Tutorial	0

Module Number	Topics	No Hrs.
1	Q1 Develop static web pages of online book store Q2 Use tables to lay-out a page The title of this webpage is "Using Forms". This should be shown in the title bar. The header "User Information" is a type 1 header; use the <h1> tag. The textarea for the address has 4 rows and 20 columns. ■ The textbox for the password is a password textbox. ■ The radiobutton for the Male gender is initially checked ■ The radiobutton for Part-time status is initially checked. ■ The checkboxes for subjects ICS 21, ICS22, and ICS34 are initially checked. ■ The drow-down dialogue box for year and course should contain BSCS-1, BSCS-2, BSCS-3, and BSCS-4, but BSCS-2 should be initially chosen. ■ Save this file as htmlex4.html.	2
2	Q3 Validate the Registration using Java script Q4 Create a basic web page following a set pattern Your page should have the following elements: • Your name as a level one header • "About me" as a level two header • A short paragraph describing something interesting about yourself • A level two heading saying something like "My Favorite things on the Internet" • A paragraph describing the things you like to do on the Internet	2
3	Q5 Write down the CSS that would set the default color to blue for Level 2 headings (i.e. <h2> elements) in a document. Q6. You are required to use div elements and CSS to achieve the layout. Create each page with the following layout	2
4	Q 7. Create XML document for user information Q 8. Write a DTD for an XML document type that should store the marks attained by each student on each module they take. Each student has a title (Mr, Mrs, Ms or Miss), a name, and an email address (which is guaranteed to be unique). For each mark it is sufficient to associate it with a module code (e.g. CC213), it is not necessary to give any further details of the module.	2
5	Q9. Design and sketch a web-based input form that would allow an administrator to input and edit the marks that a student has attained on each module (assume that	2

the administrator has already logged in to the system).

Q10 Describe the basic syntax of CSS with the aid of an example that would set the default color to red for normal paragraph text.

Q 11 Create a CSS file to render your XML data, and an XML file linking to it. Call it filename_css.xml and filename.css Q12. Given that the \<pre\> tag in HTML is used to present text such as program code, explain the following CSS declaration, and Suggest a likely purpose for it: pre.codebox {border: solid;padding: 0.5em;}	2

Q13. Explain the various parts of the following HTML document, including the definition and usage of the JavaScript code, and describe the appearance of the web page it creates (the line numbers are for you to refer to, and are not part of the HTML).

```
<html>
<head>
<script type="text/javascript"><!--
messages = ["Hello", "G'day", "Ola", "Bonjour"];
function hello(){
var rand = Math.floor(messages.length*Math.random());
document.write(messages[rand]);
}
// -->
</script>
<title>Greeting</title>
</head>
<body>
<h1>
<script type="text/javascript"><!--
hello();
//-->
</script>
<noscript>
Hello
</noscript>
World.
</h1>
</body>
</html>
```

Q14. Identify the types of HTML tags used as form input elements (including the buttons), and describe the validation you would perform on the client.

[2]

Q15. The XML document shown below is intended to mark-up data relating to a CD music catalogue. The XML describes the fact that the artist Bob Dylan released an album called desire in 1976.

```
<Catalogue>
<BobDylan desire = "1976" />

</Catalogue>
```

[2]

Ignoring the ellipses (i.e., the '...'), state with reasons
whether the document is well formed XML.

Q 16. Write a JavaScript function which receives a day number in its parameter list
and returns a string upon execution. The string returned must be the Week day
corresponding to day number OR "invalid day number"

Q17. Write the JavaScript code necessary to prompt for a day number via a dialog
box, process the day number via the function defined in part b) above, then display
the returned string via a dialog box.

2

Q 18. Write JavaScript code to generate a simple table that displays each day of the
numbers from 1 to 7 in the first column and its corresponding day of the week (using
the function defined in part b) in the second column as shown below:

Day no.	Day of Week
1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday

2

Q19. Define a CSS class specific to the <h3> tag where the text is teal colored,
Times Roman font, 24 point in size, background color is white, and the element is
enclosed in a box with double lines

Q20 Text shadowing can be achieved using CSS properties which control
positioning. Define two CSS rules, namely #banner and #shadow

Q

21Define a CSS rule which shows text with a line through it, the text being red in
color and in italics, such that the rule can be applied to an inline element

2

Q22 The following frameset diagram has a title bar (source titlebar.html) that
occupies 15% of the vertical space of the window, a list of internal navigation links
(source - navbar.html) and a destination frame (initial source - start.html) which
occupy 20% and 80% of the horizontal space respectively.

Title Bar	
Navigation Bar	Destination Frame

Clicking links from the navigation bar will cause the page to be loaded into the
destination frame.
Write the complete frameset document to the above specification

		2

	Q23. Supply well written HTML code to generate the following Web Page. The page contains an image 'feral.jpg'(180x120pixels). The email address is n.mcewan@latrobe.edu.au and the 'home', 'history' 'photos' and 'movies'links are hypertext links to feralracing.html, racehistory.html and two named anchor tags (photos & movies) withinmultimedia.html respectively. The NHRA online link is a hypertext link to http://nhra.com. This web page makes use of only one table and has a background image ' yellowCudaBG.jpg'.
	
	Q24. Design a web page and your page should have the following elements:
	    • Your name as a level one header
	    • "About me" as a level two header
	    • A short paragraph describing something interesting about yourself
	    • A level two heading saying something like "My Favorite things on the Internet"
	    • A paragraph describing the things you like to do on the Internet	

	Q25. Write a complete web page which requires the user to input a month number. When the user pressesa button labeled "determine month number", the name of the month will be displayed in a box on thecurrent webpage. Should the user enter an inappropriate month number, an appropriate message will bedisplayed in the box where the month name appears. If there is no entry for the month number when thebutton is pressed, a dialog box must appear which indicates that an entry must be made. Q26. Design a page given below :-- Choose the colour you would like: Red, Blue, Orange, Green Choose the design you would like: This is Design 1 	2

Course Code: IFT2107		Course Title: C++ Programming				
Total Credits	3	Theory	3	Tutorial	0	

Module No.	Topics	No Hrs.
1	**Module I: Overview of C++** What is Object Oriented Programming, Characteristics of OOP, Difference between C and C++. Basics:-Input/Output in C++ using cin/cout, Preprocessor Directives, Data Types-Integer, Float, character, Enumerated data types, library functions, comments, storage classes, manipulators, type conversion, arithmetic operators, arrays and strings.	6
2	**Module II: Classes and objects** Functions: Simple functions, passing arguments to functions, returning values from functions, reference arguments, returning by reference, Overloaded functions, Inline functions, Structures, defining the structure variable, assessing members of structure, assessing structure members using pointers Classes and objects: A simple class, C++ objects as physical objects, objects as function arguments, returning objects from functions, static class data, array as class data member, array of objects.	10
3	**Module III: Inheritance** Inheritance, Types of Inheritance, access modes - public, private & protected, Abstract Classes, Ambiguity resolution using scope resolution operator and Virtual base class, Constructors, Destructors, copy conotrcutor, Dynamic constructor.	10
4	**Module IV: Polymorphism** Polymorphism, Type of Polymorphism - Compile time and runtime, Function Overloading, Operator Overloading (Unary and Binary) Polymorphism by parameter, Pointer to objects, this pointer, Virtual Functions, pure virtual functions.	10
5	**Module V: Files and Exception Handling and I/O** Files and Streams: streams, string I/O, character I/O, file pointer, error handling, command line arguments. **formatted and Unformatted Input output. Exception Handling:** Try catch block, rethrowing exception.	10

Text & Reference Books	
1	Programming with C++, Ravi Chandran
2	Mastering C++, Venugopal
3	Programming in C++, SCHAUM's series
4	The complete reference C++, Herbert Schildt
	Turbo C++, Robert Lafore
Online Resources	
1	

Lab Course Code: IFT2108	Lab work Course Title: C++ Programming Lab		
Total Credits	1	Practical Hrs. 2	Tutorial

Assignment Number	Topics	No Hrs.
1	WAP to calculate factorial of a given number n.	2

	WAP to do the following:
	    a. Generate the following menu:
	          1. Add two numbers.
	          2. Subtract two numbers.
	          3. Multiply two numbers.
	          4. Divide two numbers.
	          5. Exit.
	    b. Ask the user to input two integers and then input a choice from the menu. Perform all the arithmetic operations which have been offered by the menu. Checks for errors caused due to inappropriate entry by user and output a statement accordingly.	

2	WAP to read a set of numbers in an array & to find the largest of them.	2
	WAP to exchange contents of two variables using call by value.	
3	WAP to exchange contents of two variables using call by reference.	2
	Calculate area of different geometrical figures (circle, rectangle, square, triangle) using function overloading.	
4	WAP to add two complex numbers using friend function.	2
	WAP to maintain the student record which contains Roll number, Name, Marks1, Marks2, Marks3 as data member and getdata(), display() and setdata() as member functions.	
5	WAP to increment the employee salaries on the basis of there designation (Manager-5000, General Manager-10000, CEO-20000, worker-2000). Use employee name, id, designation and salary as data member and inc_sal as member function (Use array of object).	2
	Write a class bank, containing data member: Name of Depositor, A/c type, Type of A/c, Balance amount. Member function: To assign initial value, To deposit an amount, to withdraw an amount after checking the balance (which should be greater than Rs. 500) , To display name & balance.	
6	WAP to define nested class 'student_info' which contains data members such as name, roll number and sex and also consists of one more class 'date' ,whose data members are day, month and year. The data is to be read from the keyboard & displayed on the screen.	2
	WAP to generate a series of Fibonacci numbers using copy constructor, where it is defined outside the class using scope resolution operator.	
7	Write a class string to compare two strings, overload (= =) operator.	2
	Write a class to concatenate two strings, overload (+) operator.	
8	Create a class item, having two data members x & y, overload '-'(unary operator) to change the sign of x and y.	2
	Create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own. WAP to implement this with array of pointers.	
9	Create two classes namely Employee and Qualification. Using multiple inheritance derive two classes Scientist and Manager. Take suitable attributes & operations.	2
	WAP to implement this class hierarchy.	

10	WAP to creat a class student containing Name & class as parameters, create another class marks which inherit student class taking own data members as mark1 & mark2 &show result.	2
11	WAP to read data from keyboard & write it to the file. After writing is completed, the file is closed. The program again opens the same file and reads it.	2

SEMESTER 2

Sem 2	Sl. No.	Course Title	(L) Hours Per Week	(T) Hours Per Week	(P) Hours Per Week	Total Credits
		Core Courses				
	IFT2201	Mathematics Paper-2	3	0	0	3
	IFT2202	Computer Networks	3	0	0	3
	IFT2203	Database Management Systems	2	0	0	2
	IFT2204	Data Structures using C++	3	0	0	3
	IFT2205	Python Programming	2	0	0	2
	IFT2206	Computer Architecture	3	0	0	3
	IFT2207	Computer Networks Lab	0	0	2	1
	IFT2208	DBMS Lab	0	0	2	1
	IFT2209	Data Structures using C++ Lab	0	0	2	1
	IFT2210	Python Programming Lab	0	0	2	1
		Value enhancement Courses (04 Credits)				
	ENV2152	Environmental Studies-II*	2	0	0	2
	CSS2251	Presentation Skills*	1	0	0	1
	BEH2251	Problem Solving & Creative Thinking*	1	0	0	1
		Open Electives (06 Credits)				
	14	*Minor Track	3	0	0	3
	15	Foreign Language	3	0	0	3
					Total	30

Course Code: IFT2201	Course Title: Mathematics – II				
Total Credits	3	Theory	3	Tutorial	0

Module Number	Topics	No Hrs.
1	Module I. Linear Systems and Gaussian Elimination: Linear systems. Matrix representation of linear systems. Gaussian-Jordan elimination. Homogeneous linear systems. Row echelon form and the General solution. Row rank of a matrix and solution sets of homogeneous linear systems and general linear systems. Elementary matrices.	6
2	Module II. Vector Spaces: Definition, examples and basic properties. Subspaces. Linear independence. Linear combinations and span. Basis and dimension. Sum and intersection of subspaces. Direct sum of subspaces.	10
3	Module III. Linear Transformations: Definition and examples. Properties of linear transformations. Rank and kernel. The rank and nullity of a matrix. The matrix representation of a linear transformation. Change of basis. Isomorphism.	10
4	Module IV. Orthogonality in Vector Spaces: Scalar products in Rn and Cn. Complex matrices and orthogonality in Cn. Inner product spaces. Orthogonality in inner product spaces. Normed linear spaces. Inner product on complex vector spaces. Orthogonal complements. Orthogonal sets and the Gram-Schmidt process. Unitary matrices.	10
5	Module V. Eigenvalues and Eigenvectors: Eigenvalues and eigenvectors. Characteristic equation and polynomial. Eigenvectors and eigenvalues of linear transformations. Similar matrices and diagonalization. Triangolizable matrices. Eigenvalues and eigenvectors of symmetric and Hermition matrices.	4

Text & Reference Books	
1	V. Krishnamurthy, V. P. Mainra, J. L. Arora -An Introduction to Linear Algebra
2	D. T. Finkbeiner -Introduction to Matrices and Linear Transformation
3	S. Kumaresan - Linear Algebra; A Geometric Approach Prentice Hall of India, 2000
4	Shanti Narayan : A Course of Mathematical Analysis; New S. Chand & Co. Pvt. Ltd.
5	TituAndreescu and DorinAndrica, Complex Numbers from A to …. Z, Birkhauser, 2006.
6	E.J. Barbeau, Polynomials, Springer Verlag, 2003.
7	Joseph A. Gallian, Contemporary Abstract Algebra (4th Edition), Narosa Publishing House, New Delhi, 1999.
8	Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory (2nd Edition), Pearson Education (Singapore) Pvt. Ltd., Indian Reprint, 2003.
9	David C. Lay, Linear Algebra and its Applications (3rd Edition), Pearson Education Asia, Indian Reprint, 2007

Course Code: IFT2202	Course Title: Computer Networks				
Total Credits	3	Theory	3	Tutorial	0

Module Number	Topics	No Hrs.
1	**Introduction** Introduction to Data Communication, Networks-protocols, advantages, disadvantages & applications, Line Configuration, topology, Transmission mode, Classification of networks. Parallel & Serial Transmissions. OSI Model, TCP/IP model.	6
2	**Physical Layer** Analog & Digital Signals, Periodic & Aperiodic Signals. **Digitization techniques**: Analog to Analog conversion, comes under Analog to Digital conversion, Digital to Analog conversion. **Transmission Media**- Twisted Pair Cable, Coaxial Cable, Fiber-Optics Cable, Radio frequency Allocation. Terrestrial Microwave, Infrared rays, Satellite Communication.	10
3	**Data Link Layer** Framing, Types of Errors, Error Detection & Correction (VRC, LRC, CRC, Checksum, Hamming Code) Flow Control (Stop-and-wait & Sliding Window), Error Control (Stop & Wait ARQ, Sliding Window ARQ using Go-back n method and Selective-Reject). Channel Allocation, Aloha, CSMA/CD, CSMA/CA.	10
4	**Network Layer** Internal Organization of Network Layer, IP addressing, Subnetting, Routing Algorithms-Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing.	10
5	**Transport Layer** Introduction to TCP/IP, Transport Layer in Internet-TCP & UDP	4
6.	**Presentation and Application Layer** Presentation layer services, Domain Name System, Remote Logging, Electronic Mail, and File Transfer, WWW and HTTP,Network Management: SNMP, Multimedia	5

Text & Reference Books	
1	Behrouz ., Forouzan., "Data Communication and Networking", TMH
2	A.S. Tanenbaum, "Computer Networks", PHI References
3	W.Stallings, "Data and Computer Communication" PHI
Online Resources	
1	https://nptel.ac.in/courses/106/105/106105183/
2	https://nptel.ac.in/courses/106/105/106105081/

Course Code: IFT2203	Course Title: Database Management System				
Total Credits	2	Theory	2	Tutorial	0

Module Number	Topics	No Hrs.
1	Introduction to DBMS: Introduction to DBMS, Architecture of DBMS, Components of DBMS, Traditional data Models (Network, Hierarchical and Relational), Database Users, Database Languages, Schemas and Instances, DataIndependence	4
2	Data Modeling Entity sets attributes and keys, Relationships (ER), Database modeling using entity, Weak and Strong entity types, Enhanced entity-relationship (EER), Entity Relationship Diagram Design of an E-R Database schema. Object model, Specialization and generalization.	6
3	Relational Database Model & Design Relational System, Codd's Rule, Relational Model, Optimization, Tables and Views, Entity, Types of Entity, Weak Entity Attributes, Entity sets, Entity – Relationship Diagrams. Domains and Relations, Relations and predicates, Relational Data Integrity; Primary Key, Candidate Key, Foreign Key and their rules; Relational operators, Relational Algebra, Relational Calculus, Types of SQL commands:DDL, DML, DCL, TCL, and DQL, Triggers, PL-SQL Commands.	8
4	Database Design Definition of Functional Dependencies, Process of Normalization, First Normal Form, Second Normal Form, Third Normal Form. Boyce Codd Normal Form, Fourth Normal Form, Fifth Normal Form.	6
5	Data Recovery & Protection Transaction ACID Properties, Recovery- Transaction recovery, System recovery, Media Recovery, Concurrency Control Techniques Lost Update Problem, Dirty Read Problem, Locking, Dead Lock, Serializability; Security- Introduction.	6

Text & Reference Books	
1	Elmasari, Navathe, "Fundamentals of Database Systems", AddisionWesley.
2	Korth, Silbertz, Sudarshan, "Database Concepts". McGrawHill.
3	Majumdar& Bhattacharya, "Database Management System", Tata McGrawHill.
4	Date C J." An Introduction to Database Systems", AddisionWesley.
5	Fundamental of Database Systems, Elmasri&Navathe, Pearson Education,Asia.
6	Database System Concepts, Korth&Sudarshan,TMH.
7	Data Base Management System, Leon & Leon, VikasPublications.
Online Resources	
1	https://nptel.ac.in/courses/106/105/106105175/

Course Code: IFT2204		Course Title: Data Structures using C++			
Total Credits	3	Theory	3	Tutorial	0

Module Number	Topics	No Hrs.
1	Basic concepts of data representation Abstract data types: Fundamental and derived data types, Representation, Primitive Data Structures.	8
2	Arrays Representation of arrays single and multidimensional arrays. Address calculation using column and rows major ordering. Various operations on arrays, Vector. Application of arrays: matrix multiplication, sparse polynomial and addition.	10
3	Stacks and Queues Representation of stacks and queues using arrays and linked list. Circular queues, priority queue and D-queue. Application of stacks: Conversion from infix to postfix expression. Evaluation of postfix expression using stacks	10
4	Linked List Singly Linked List; operations on list. Linked stack and queue. Polynomial representations and manipulation using linked list, doubly linked list, addition of two polynomial list. Trees: Binary trees traversal method: preorder, in-order, post-ordered traversal. Recursive and non-recursive algorithm for above mentioned Traversal methods. Representation of trees and its application: Binary tree representation of a tree, Binary search tree: height balanced (AVL) tree	8
5	Searching, Sorting and complexity Searching: Sequential and binary search, indexed search. Sorting: Insertion, selection, bubble, quick, merge, heap sort. Graphs Graph representation: adjacency list, adjacency multicasts. Traversal scheme: Depth first search, Breadth first search. Spanning tree: definition, minimal spanning tree algorithms.	9

Text & Reference Books	
1	T. Langsam, M.J Augenstein and A.M. Tanenbaum, "Data structure using C and C++ Secondedition, 2000, Prentice Hall ofIndia
2	R.Kruse, G.L. Tonodo and B. Leung," Data structures and program design in C", SecondEdition, 1997, Pearsoneducation.
3	S. Chottopadhayay, D. Ghoshdastidar& M. Chottopadhayay. Data structures through language", Firstedition, 2001, BPBPublication
4	Data Structures Using C++ Paperback – 1 by D.S. Malik
Online Resources	
1	https://nptel.ac.in/courses/106/105/106105085/

Course Code: IFT2205	Course Title: Python Programming				
Total Credits	2	Theory	2	Tutorial	0
Module Number	**Topics**				**No Hrs.**
1	Python Basics: Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() Function and Is Operator, Dynamic and Strongly Typed Language Declaration & Assignments: Preliminaries: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings Lists: Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement. Dictionaries: Creating Dictionary, Accessing and Modifying key: value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, The del Statement Tuples and Sets: Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Tuple Methods, Using zip() Function, Sets, Set Methods, Traversing of Sets, Frozenset()				8
2	Flow Control Python Decision Making: The if Decision Control Flow Statement, The if…else Decision Control Flow Statement, The if…elif…else Decision Control Statement, Nested if Statement Python Loops: The while Loop, The for Loop, The continue and break Statements Function and Methods : Defining A Function, Calling A Function, Types Of Functions, Function Arguments, Anonymous Functions, Global And Local Variables, Using Optional And Named Arguments, Using Type, Str, Dir, and other Built-In Functions Files : Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules Python Exception Handling: Exception handlers in Python, try – except clause with no exception, except clause with multiple exceptions, the try – finally clause				10
3	Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, The Constructor Method, Classes with Multiple Objects, Class Attributes versus Data Attributes, Encapsulation, Inheritance, The Polymorphism				5

4	Python Advanced :		7
	Regular Expression Operations:Using Special Characters, Regular Expression Methods, Named groups in Python regular expressions, Regular Expression with glob Module.		
	Python Network Programming :Python Network Services, Defining Sockets, Socket Programs		
	Python Database Connections: Python Databases interfaces, DB-API, Benefits of Python Database Programming, Defining MySQL database, Database Operations.		
	Python Data Processing and Encoding : Representing CSV Files in tuples, Defining JSON, Dealing with JSON data		
5	Python Advanced :		5
	Data Visualization using Matplotlib and Seaborn: Customizing Plots, Plotting 2D arrays, Statistical Plotting		
	GUI Development using tkinter :GUI Development , Standard attributed for GUI, methods for Geometry management		

Text & Reference Books	
1	Beginning Programming with Python For Dummies Learning Python by Fabrizio Romano
2	Python Projects by Laura Cassell, Alan Gauld / Wiley
3	Head First Python by Paul Barry / Shroff / O'Reilly Publisher
4	Beginning Programming with Python for Dummies by John Paul Muller / Wiley India Pvt Ltd
5	Python Cookbook by David B. Brain K. Jones / Shroff / O'Reilly Publisher
Online Resources	
1	https://nptel.ac.in/courses/106/106/106106145/

Course Code: IFT2206	Course Title: Computer Architecture				
Total Credits	3	Theory	3	Tutorial	0

Module Number	Topics	No Hrs.
1	**General Computer Architecture** Block Diagram of typical Computer, Memory Section, Input/ Output Section, CPU, Registers, Arithmetic Unit, Instruction handling Areas, Stacks **Register Transfers & Micro operations:** Register Transfer, Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shift Unit	9
2	**Basic Computer Organization and Design** Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input Output Instructions and Interrupts **Control Memory:** Control Word, Microinstruction, Microprogramming, Control Memory, Hardwired control	9
3	**Central Processing Unit** General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, RISC, CISC **Vector Processing:** Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Vector Processing, Array Processors	9
4	**Input Output Organization** I/O Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA, IOP, Serial Communication **Memory Organization:** Associative Memory, Cache Memory, Virtual Memory	9
5	**Computer Arithmetic** Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, Floating- Point Arithmetic Operations	9

Text & Reference Books	
1	Morris Mano, Computer System Architecture, 3rd Edition – 1999, Prentice-Hall of India Private Limited.
2	Harry & Jordan, Computer Systems Design & Architecture, Edition 2000, Addison Wesley, Delhi.
3	William Stallings, Computer Organization and Architecture, 4th Edition-2000, Prentice-Hall of India Private Limited.
Online Resources	
1	https://nptel.ac.in/courses/106/105/106105163/
2	https://nptel.ac.in/courses/106/106/106106134/
3	https://nptel.ac.in/courses/106/103/106103068/

Lab Course Code: IFT2207		Lab work Course Title: Computer Networks Lab		
Total Credits	1	Practical 2 Hours/Week	Tutorial Nil	
Assignment Number	**Topics**			**No Hrs.**
1	Cabling a Network			2
2	Configure a network having four PCs and a switch			2
3	Configure a network having four PCs, Switch and a router			2
4	Configure a network having four PCs, two switches and two routers			2
5	Configure a network six PCs, three Generic Switch & three Generic Router			2
6	Subnetting Scenario 1			2
7	Subnetting Scenario 2			2
8	Basic VLSM Calculation and Addressing Design			2
9	Basic RIP Configuration			2
10	Basic EIGRP Configuration			2
11	Basic OSPF Configuration			2
12	Implementation of NAT and PAT.			2
13	ISP Connectivity & Troubleshooting.			2
14	ISP Connectivity & Troubleshooting.			2
15	ISP Connectivity & Troubleshooting.			2

Software & Tools Required

1	Packet Tracer

Text & Reference Books

1	Data Communication and Computer Network, Forozoun, TMH Publication

Online Resources

1	https://nptel.ac.in/courses/106/105/106105183/
2	https://nptel.ac.in/courses/106/105/106105081/
3	https://www.packettracernetwork.com/Table/tutorials/

Lab Course Code: IFT2208	Lab work Course Title: DBMS Lab		
Total Credits	1	Practical : 1	Tutorial: 0

Assignment Number	Topics	No Hrs.
1	Create the following table Employee with fields EmpID, E_NAME, SALARY,JOB,DB,DOJ.	2
	a. Find all the Employees who has DOB between 1 Jan 1996 to 1 Jan 2000. b. Find all the distinct DeptID in Employee table and department table.	
2	a. Find name of all employees who's working in DeptID 2. b. Find all the employees that are not associated with DeptID 2 and 3.	
	a. Find total number of employees and total number of departments. b. Find different number of jobs available.	
3	a. Find the details of Employees who's not working as Software Engineer. b. Find the ID of those Employees whose job is Software Engineer and Salary is greater than 100000.	2
	a. Hike salary of employee by 20% with position Software Engineer. b. Change DeptID to 3 whose job is Software Engineer and Salary > 50000. c. Change EmpName to xyz where EmpID is 2304 and salary not equal to 30000.	
4	a. Find EmpID where salary is highest. b. Find second highest salary. c. Find EmpID of employees with second highest salary. d. Decrease the salary by 10% of employee who is getting second highest salary.	2
	a. Select all employees that are not associated with any department. b. Select all departments with no employees. c. Find the names of employee working in department IT.	
5	Create the following(s)table Salespeople with fields snum, sname, city, commission Orders table with fields onum, odate, snum, amt Customers table with fields cnum, cname, city, rating, snum	2
	a. Display name & city of salesman where city is"Pune". b. Display the numbers of sales persons, with orders currently in the orders table without any repeats.	
6	a. List all customers not having city "Pune" or rating more than100 b. Display all customers excluding those, with rating less than equal to 100, unless they are located in "Nagar".	2
	a. Assume each salesperson has a 12% commission on order amt. Display orderno, snum, commission for thatorder. b. Display the count of snum in order table without duplication ofsnum.	

7	**1.** Create a table with the under-mentioned structure (Table name isEmp) EmpNo NUMBER(4)
	        DeptNo NUMBER(2)
	        EmpName CHAR(10)
	        Job CHAR(10)
	        Manager NUMBER(4)
	        HireDate DATE
	        Salary NUMBER(7,2)
		2

	Commission NUMBER (7,2)
	2. Create a table with the under-Mentioned structure (Table
	    name is Dept) DeptNo NUMBER(2)
	    DeptName CHAR(12)
	    Location CHAR(12)	

	1. Write SQL statements to list all employees in the followingformat: EMPLOYEE WORKS IN DEPARTMENT Dept.No SMITH WORKS IN DEPARTMENT 20 SUDHIR WORKS IN DEPARTMENT 20 RAJWORKS IN DEPARTMENT 10 SMITHS WORKS IN DEPARTMENT 30 SANTOSH WORKS INDEPARTMENT 30	
8	Create a table with the under-mentioned structure (Table name is Sports) Student(Student No., Class, Name, Game1, Grade1, Game2, Grade2).	2
	a. Display the names of the students who are getting a grade C in either GAME1 orGAME2. b. Display the number of students getting grade A incricket.	
9	a. Display the names of the students who have same game for both GAME1 andGAME2. b. Display the games taken by the students, whose name starts with "A".	2
	a. Assign a value 200 for Marks for all those who are getting grade B or above inGAME. b. Arrange the whole table in the alphabetical order ofName.	
10	a. Write a command to delete those records from the table which have Grade1 ="A" and then COMMIT the changes in the database. b. Undo the task using rollback.	2
	Write a SQL command where you plan to delete the three different records from the Student table. You want to create a SAVEPOINT before each delete, so that you can ROLLBACK to any SAVEPOINT at any time to return the appropriate data to its original state.	

11	PL/SQL Queries:
	    a. Write a procedure to display a message.
	    b. Write a procedure that taken input from user and display it.
	    c. Write a PL/SQL code to print sum of two numbers taken from the user.
	    d. Write a procedure to use for loop to insert ten rows into a database table.
		2

	a. Given Student Report Database, in which student marks assessment is
	     recorded. In such schema, create a trigger so that the total and average of
	     specified marks is automatically inserted whenever a record is insert.
	b. Create a trigger to calculate the percentage of the student as soon as his
	     details are updated to the database.
	c. Drop an existing trigger.	

12	a. Write a sequence query creating sequence in ascending order. b. Write a sequence query creating sequence in descending order. c. Using sequence create a table named students with columns as id and name.	2

	DBA Commands:
	    a. Users, Roles and Privileges.
	    b. Creating a User
	    c. Password Management.	

	d. Grant and Revoke	

Software & Tools Required	
1	Oracle
2	MySQL
Text & Reference Books	
1	Majumdar& Bhattacharya, "Database Management System", Tata McGrawHill.
2	Date C J." An Introduction to Database Systems", AddisionWesley.
3	Fundamental of Database Systems, Elmasri&Navathe, Pearson Education,Asia.
Online Resources	
1	https://nptel.ac.in/courses/106/105/106105175/

Course Code: IFT2209	Course Title: Data Structures using C++ Lab				
Total Credits	1	Practical	2	Tutorial	0
Assignment Number	**Topics**				**No Hrs.**
1	Write a program to remove all the duplicate elements present in the given array. Write a program to search an element using Linear Search. Write a program to search an element using Binary Search. Write a program to sort the given array using Bubble Sort. Write a program to sort the given array using Selection Sort.				5
2	Write a program to sort the given array using Insertion Sort. Write a program to insert a new element in the given sorted array at proper place. Write a program to delete an element from given sorted array. Write a program to perform addition of two matrices. Write a program to perform multiplication of two matrices.				5
3	Write a program to find out transpose of a given matrix. Write a program to implement Stack using array, also show overflow and underflow in respective push and pop operations. Write a program to implement Queue using array, which shows insertion and deletion operations. Write a program to implement Circular Queue using array, which shows insertion and deletion operations. Write a program to implement Linear Linked List, showing all the operations, like creation, display, insertion, deletion and searching.				5
4	Write a program to implement Stack, using Linked List. Implement Push, Pop and display operations. Write a program to implement Queue, using Linked List. Implement Insertion, deletion and display operations. Write a program to count the number of times an item is present in a linked list.				5
5	Write a program to increment the data part of every node present in a linked list by 10. Display the data both before incrimination and after. Write a program to implement Doubly Linked List, showing all the operations, like creation, display, insertion, deletion and searching.				5
6	Write a program to create a Binary Search Tree and display its contents using preorder, postorder and inorder traversal. Write a program to implement insert, delete and search operations in a Binary Search Tree				5

Software and tools Required	
1	Dev C++/Turbo C++
Text and Reference Books	
1	S. Chottopadhayay, D. Ghoshdastidar& M. Chottopadhayay. Data structures through language", Firstedition, 2001, BPBPublication
2	Fundamentals of Data Structures in C++ by Ellis Horowitz, SartajSahni, Dinesh Mehta Published by Silicon Pr.
3	Data Structures and Algorithm Analysis in C++ Mark A. Weiss Pearson
4	Data Structures and Algorithms in C++, 2ed by Michael T Goodrich and Roberto Tamassia and David Mount, John Wiley
Online Resources	
1	https://cse01-iiith.vlabs.ac.in/ --virtual lab
2	https://nptel.ac.in/courses/106/102/106102064/

Lab Course Code: IFT2210	Lab work Course Title: Python Programming Lab		
Total Credits	1	Practical : 2 Hrs per Week	Tutorial: 00
Assignment Number	**Topics**		**No Hrs.**
1	Python Basics - Write a python program to generate a simple calculator. - Write a python program to find the sum of the first five terms of the Fibonacci series. - Write a python program to swap the values of two variables and later print the new value. - Write a python program to find the square root of a number. - Write a python program that prints the area and circumference of a circle given the radius of the circle as the input. - An Armstrong number is a number that is equal to the sum of cubes of its digits. For example 0, 1, 153, 370, 371 and 407 are Armstrong numbers. Write a python program to find out whether a number entered is Armstrong number or not.		2
2	Strings: <ol start="7"> - Write a python program to implement slicing of strings. - Write a python program to add 'ed' at the end of a given verb string (length should be at least 3). If the given string already ends with 'ed' then leave it unchanged. Sample String : 'walk' Expected Result : 'walked' Sample String : 'tied' Expected Result : 'tied' - Write a version of a palindrome recognizer that also accepts phrase palindromes such as "Go hang a salami I'm a lasagna hog.", "Was it a rat I saw?", "Step on no pets", "Sit on a potato pan, Otis", "Lisa Bonet ate no basil", "Satan, oscillate my metallic sonatas", "I roamed under it as a tired nude Maori", "Rise to vote sir", or the exclamation "Dammit, I'm mad!". Note that punctuation, capitalization, and spacing are usually ignored. - A pangram is a sentence that contains all the letters of the English alphabet at least once, for example: The quick brown fox jumps over the lazy dog. Your task here is to write a function to check a sentence to see if it is a pangram or not. - In cryptography, a Caesar cipher is a very simple encryption techniques in which each letter in the plain text is replaced by a letter some fixed number of positions down the alphabet. For example, with a shift of 3, A would be replaced by D, B would become E, and so on. The method is named after Julius Caesar, who used it to communicate with his generals. ROT-13 ("rotate by 13 places") is a widely used example of a Caesar cipher where the shift is 13. In Python, the key for ROT-13 may be represented by means of the following dictionary: key = {'a':'n', 'b':'o', 'c':'p', 'd':'q', 'e':'r', 'f':'s', 'g':'t', 'h':'u', 'i':'v', 'j':'w', 'k':'x', 'l':'y', 'm':'z', 'n':'a', 'o':'b','p':'c', 'q':'d', 'r':'e', 's':'f', 't':'g', 'u':'h', 'v':'i', 'w':'j', 'x':'k', 'y':'l', 'z':'m', 'A':'N', 'B':'O', 'C':'P', 'D':'Q', 'E':'R','F':'S', 'G':'T', 'H':'U', 'I':'V', 'J':'W', 'K':'X', 'L':'Y', 'M':'Z', 'N':'A', 'O':'B', 'P':'C', 'Q':'D', 'R':'E', 'S':'F','T':'G','U':'H', 'V':'I','W':'J','X':'K','Y':'L','Z':'M'} Your task in this exercise is to implement an encoder/decoder of ROT-13. Once you're done, you will be able to read the following secret message: Pnrfnepvcure? V zhpucersrePnrfnefnynq!		2

		Note that since English has 26 characters, your ROT-13 program will be able to both encode and decode texts written in English.	

3.	Dictionary:
	    12. Given a dictionary of students and their favorite colours:
	        people={'Arham':'Blue','Lisa':'Yellow',''Vinod:'Purple','Jenny':'Pink'}
	        a. Find out how many students are in the list
	        b. Change Lisa's favourite colour
	        c. Remove 'Jenny' and her favourite colour
	        d. Sort and print students and their favouritecolours alphabetically by name
	List :
	    13. Write a python program that takes two lists as input and prints the common elements from the two lists in a third list (Output).
	    14. Write a Python program to get a list, sorted in increasing order by the last element in each tuple from a given list of non-empty tuples.
	        Input : [(12, 15), (11,1 2), (14,14), (12, 13), (12, 11)]
	        Expected Output : [(12, 11), (11, 12), (12, 13), (14, 14), (12, 15)]	

4.	Python Decision Making
	    15. Write a Python program which iterates the integers from 1 to 20. Prints a string "Hi" for multiples of four, prints "Hello" instead of the number for the multiples of five and print "How are you" for numbers which are multiples of both four and five.
	    16. Write a python program to perform the following operations on a list of numbers.
	            (i) Linear Search (ii) Binary Search
	Python Loops:
	
	    17. Using for loop, write and run a Python program for this algorithm.
	        Here is an algorithm to print out n! (n factorial) from 0! to 10! :
	        1. Set f = 1
	        2. Set n = 0
	        3. Repeat the following 10 times
	    18. Write a Python program to print the following alphabets pattern :
	        "A","D","L","T".
		2

5.	Functions & Methods:
	
	    19. Define a function overlapping() that takes two lists and returns True if they have at least one member in common, False otherwise.
	    20. Generate a function to calculate sum from 1 to x (i.e 1+2+3+…..x). Implement recursion for the same.
	    21. Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.
		2

6.	Files
	
	    22. Write a python program to find the Hash of the file
	    23. Write a python program to read a file line by line and store the contents in a (i) variable (ii) list (iii) array
	    24. Write a Python program to remove newline characters from a file
		2

7.	Object Oriented Programming	2
	25. Python supports different programming approaches. One of the popular approaches to solve a programming problem is by creating objects. This is known as Object-Oriented Programming (OOP). An object has attributes and it exhibits some behavior. Taking an example a "Girl" as an object, consider the following characteristics of the object and perform the following operations further. Attribute: Name, Age, Height Behavior : Studying, Playing, Dancing Write a python code to demonstrate the following operation with regards to the context given: a. Creation of class and objects b. Creation of methods c. Use of Inheritance d. Data Encapsulation e. Polymorphism	
8.	Regular Expression Operation	2
	26. Write a python code to find the occurrence of "ing" in the string. 27. Write a python program that finds whether a string starts with a word or a blank space. The expected output is "Match Found" if the string starts with the word otherwise "No match". 28. A network administrator decides to write an IP address in a particular format. He does not want to keep the leading zeroes in an IP address. e.g If the input IP address is 192.08.09.34 the output should be 192.8.9.34. Write a Python code to help the network administrator achieve this.	
9.	Python Network Programming	2

	29. Write a Python program to create a network architecture by implementation of
	    a. simple client
	    b. simple server
	Using Socket Programming.	

10.	Python Database Connections & Python Data Processing and Encoding	2
	30. Write a Python program to read specific columns of a given CSV file and print the content of the columns. 31. Write a Python program to create a SQLite database and connect with the database and print the version of the SQLite database	
11	Data Visualization using Matplotlib and Seaborn	2

	32. Import an appropriate dataset and plot the different chart as mentioned
	    Histogram
	    Column Chart
	    Box Plot Chart
	    Pie Chart	

	Scatter plot 33. Import an appropriate dataset and visualize statistical relationships using Seaborn plotting functions.		
12.	GUI Development using tkinter		2

	34.Write a Python GUI Program to import Tkinter package and
	  a. Create a window and set its title.
	  b. Add a label to the window
	  c. Change the label font style (font name, bold, size) using tkinter module
	  d. Set the default window size
	  e. Disable to resize the window		

Software & Tools Required	
1	Python 3.8.5
Text & Reference Books	
1	Head First Python by Paul Barry / Shroff / O'Reilly Publisher
2	Beginning Programming with Python for Dummies by John Paul Muller / Wiley India Pvt Ltd
Online Resources	
1	https://pythonspot.com/