

# **Gondwana University, Gadchiroli**



**Choice Based Credit System (CBCS)**

## **Syllabus of**

**B.Sc. (Computer Science) - I  
Optional Subject  
(Three Years Degree Course)**

**Submitted by**

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**Chairman, BOS Computer Science**

**2017-2018**

**Note :Direction and scheme of B.Sc. is available in the website of Gondwana University, Gadchiroli( [www.gondwana.digitaluniversity.ac](http://www.gondwana.digitaluniversity.ac))**

**B.Sc. (Computer Science) is one of the optional subjects along with other two subjects offered/selected by student among the groups offered by respective college.**

<b>B.Sc. (Computer Science)– I(Semester - I)</b>											
Subject	Paper Code	Paper Name	Total Period /Week	Credit	Theory (Th) Assessment				Practical (Prac.) Assessment		Total (Th +Prac)
					IA	UE	Total	Min. Passing (35%)	UE	Min. Passing (35)	
Core Course	USCST01	INFORMATION AND COMMUNICATION TECHNOLOGY	6T + 1Tu (Per Batch)	6	10	50	60	42 Marks	30	11	150
	USCST02	PROGRAMMING TECHNIQUES & INTRODUCTION TO 'C'			10	50	60				

\*Student must appear for University Practical Examination otherwise he/she will be treated as fail. However their Internal marks will be carried forward.

- **Core:** Major theory papers in the concerned subject.
- T represents Theory while TU represent Tutorial.
- **IA**(Internal Assessment) :It will be evaluated by Internal Examiner appointed by College in consultation with the University. (Refer Appendix 1)
- **UE**(University Examination): It will be evaluated by External Examiner appointed by University. (Refer Appendix 1 & 3)
- **Period:** Each period is of 48 minutes or as per Government direction from time to time.
- In Paper Code
  - 1<sup>st</sup> Letter (U) : Represent it a Under Graduate Course.
  - 2<sup>nd</sup> Letter (S) : Represent it is Science Faculty
  - Next 2 Letter (CS) : Represent the subject Computer Science
  - Next Letter (T/P) : T : Represent Theory Paper (Refer Appendix 1)  
P : Represent Practical (Refer Appendix 1 & 2)
  - Last two letter : Represent Paper No. for Ex. 01 Represent Paper no. 1
- **Lab\* : 1)** Not more than two students should be allowed to do practical on one machine.2)Wherever possible Practical's should be perform using Open Source Software.
- **Batch:** Each batch can be of Maximum 16 students.

## B.Sc. (Computer Science)– I(Semester - II)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	Theory (Th) Assessment				Practical (Prac.) Assessment		Total (Th +Prac)
					IA	UE	Total	Min. Passing (35%)	UE	Min. Passing (35%)	
Core Course	USCST03	OPERATING SYSTEM & LINUX	6T + 1Tu (Per Batch)	6	10	50	60	42	30	11	150
	USCST04	STRUCTURED Programming With 'C'			10	50	60				

# **B.Sc. - I (Computer Science)**

## **SEMESTER – I**

**B.Sc. - I**  
**SEMESTER – I**  
**(Computer Science)**

**Paper –I: INFORMATION AND COMMUNICATION TECHNOLOGY**

**[Max. Marks: 50**

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**UNIT-I: Introduction to IT and Computers**

Block Diagram of Computer, Functioning of Computer, Characteristics

**Computer Memory:** Primary & Secondary, Types of Primary Memory.

**Number System:** Decimal, Binary, Octal, Hexadecimal number systems and their Intercoversion, ASCII codes

**UNIT-II: I/O and Storage Device**

**Input Devices:** Keyboard **Locator Device:** Mouse, Joy Stick

**Pick Device:** Light Pen, Touch Screen, **Scanning:** MICR, OCR, OMR, Barcode Reader.

**Vision Capturing:** Webcam, Digital Camera

**Output Devices:** VDU, Printer : Dot Matrix, Laser, Projector.

**Storage Device:** Hard Disk, Optical Disk, Blu Ray Disk and Pen Drive.

**UNIT-III: Windows**

Operating System, Classification of Operating System on the basis of task (Single User Single Task, Single User Multiple Task, and Multi-User Multiple Task), Features of Windows, Desktop and Windows Explorer.

**Control Panel:** Administrative Tools-Date and Time, Display, Mouse, Programs and Features. Usage of Recycle Bin

**Windows Accessories:** Calculator, Notepad, Paint, Disk Cleanup

**UNIT-IV: Network & Internet**

Computer Communication, Need for Networks, Communication Device, Types of Network- LAN, WAN, MAN, Concept of Network Topology, Types of Topologies and its Advantages and Limitations

**Internet:** Basic Internet terms, Internet Addressing, Detail about E-mail, Search Engine, Social and Ethical Issues, E-learning.

**Open Source Terminologies:** Open Source Software, Freeware, Shareware, Proprietary Software.

**Text Books:**

- 1) Peter Nortorn's, "Introduction to Computer", TMH, 2004, ISBN-0-07-05-3142-0
- 2) Dr. S. B. Kishor, "Information and Communication Technology", Das Ganu Prakashan
- 3) Chetan Shrivastava "Fundamentals of Information Technology", Kalyani publishers, 2002, ISBN-81-7663-576-6

**References:**

- 1) Dr. S. B. Kishor, "MS-Officewith Office Automation", DAS GANU Prakashan, ISBN : 978-93-81660-67-6
- 2) Akshay Kumar, "Information Technology and Info Guide", Authors press, 2000, ISBN-81-7273-040-3

**B.Sc. - I**  
**SEMESTER – I**  
**(Computer Science)**

**Paper – II: PROGRAMMING TECHNIQUES & INTRODUCTION TO ‘C’**

**[Max. Marks: 50**

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**UNIT – I: Language Evolution**

Machine Language, Assembly Language, High Level Language. Translators: Compiler, Interpreter and Assembler. The Compilation Process, Linker, Loader, Study of HLL, Characteristics of Good Language

**UNIT – II: Programming Construction Tools**

Problem Analysis, Process Analysis, Conceptual Development of Solution. Development Tools: **Algorithm:** Advantage and Disadvantage of Algorithm, Complexity of Algorithm  
**Flowcharts:** Advantage and Disadvantage of Flowchart.

**UNIT – III: Introduction to C**

C-Character Set and Keyword, Constants and Variables, Data types, Type Casting, **Operators and Expressions** – Arithmetic, Relational, Logical Assignment, Increment and Decrement Operator, Updating Assignment, Conditional Operator, Hierarchy of Operators, Input and Output statements in C.

**UNIT – IV: Conditional and Looping Statements**

**Conditional Statement:** if-else, nested if, else-if ladder, switch, ternary Operator

**Looping Statement:** for loop, while and do- while loop, Comma Operator and Use of break, continue and goto statements.

**Text Books:**

- 1) Dr. S. B. Kishor, “Programming Logic and Techniques”, BlackSwan (University Press), ISBN 978 81 7371 822 9
- 2) E.Balguruswami, “Programming in ANSI C”, TMH, 2009, ISBN-978-0-07-0648220/0-0-0-70-0648220-0.

**References:**

- 1) RAJARAMAN, “COMPUTER PROGRAMMING IN C”, PHI, 2002, ISBN-81-203-0859-X.
- 2) K.R. Venugopal and S.R. Prasad,” Mastering C”, TMH, 2008, ISBN-13:978-0-07-061667-7/10:0-07-06-1667-1.
- 3) Dr. S. B. Kishor, Dr. V.Godki, “Gateway to C Programming”, Lambert, 2011, **ISBN : 978-3-8454-1474-4**

**B.Sc. - I (Computer Science)**  
**SEMESTER – I**  
**Practical**

**[Max. Marks : 30**

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**Practical based on IT, Office Automation**

**A) Information Technology**

1. Study of various input devices with troubleshooting.
2. Study of various output devices.
3. Study of booting process.
4. To study assembling and deassembling the PC.
5. To study and installation of antivirus software
6. Procedure to cleanup Disk, Disk fragmentation

**B) LibreOffice Writer/Ms-Word**

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

**CONTENTS**

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

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

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

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

1.  $B^2 - 4AC = 0$
2.  $H_2SO_4$
3. If  $(A^2 \geq 0)$
4.  $f(x) = \sum_{i=1}^{i=5} 5 * X^i$
5.  $k^2 - 4 = 0$ , if  $b_0 \neq 0$
6.  $e^{i\theta} + e^{-i\theta} = 2\cos\theta$

2. Type the following letter and take printout

ABC

SAI Nagar  
Mumbai

☎020-1111111

Dear Sir,

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

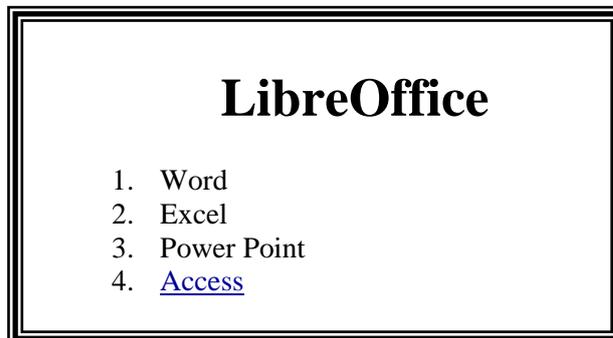
- Computer 🖨 with following configuration
  - Intel® Pentium® Processor T4400 ( 2.2 Ghz, 1MB L2 Cache, 800 MHz FSB)
  - 250 GB HDD, DVD RW, 35.56cms (14) CSV LED Backlit, 1GB DDR3 RAM
- Floppy disk 🖨 of 1.44 MB of 12 Box
  - Sony
  - Verbatin
- 3-Button mouse 🖨 of following 5 each
  - a) i-ball
  - b)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

Thanking you,

Date : < Insert System Date >

Your  
**XYZ**

3. Type the following



- a) **Ms-Word:** MS-Word is the application software and one of the most powerful word processor in Windows operating system. It is used for formatting of letters or the text. In simple meaning it is a word processor having various functions for text you may insert different objects like pictures, sound and video or calendar in word file.
- b) **Ms-Excel:** Ms-Excel is a powerful spreadsheet or worksheet application that can use for managing, analyzing and presenting data in tabular format. It also helps to display data in graphical format using charts.
- c) **Ms-Power Point:** Ms-Powerpoint is a powerful tool to create professional looking presentation and slide shows.
- d) **Ms-Access:** Ms-Access is a powerful program to create and manage database.

**Perform the following operation,**

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

4. Define and write the characteristic of computer and perform following operation,
- Divide the text in two columns
  - Insert the picture of computer in the background in each column.
  - Insert header with your name
  - In footer write name of your college
  - Give proper heading for phrase.
  - Use Drop Cap for 1<sup>st</sup> letter of each paragraph
  - Define line spacing 1.5 with left margin 1.25" and right margin 0.75"
  - Font : Courier New, Font size for heading 14 and for normal text 11
  - Finally take a print out.
5. Type the following letter exactly as given below,  
Before start of typing, set up page in the following format

- Page Size : A4 with Landscape Orientation
- Left Margin: 2" Right Margin: 1" Top Margin: 0.5"

Computer Stream after 12<sup>th</sup>



COMPUTER

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

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

6. Write a letter to publisher for supplying the list of books along with book details. For ex.
- To,  
 Publisher,  
 Das Ganu Prakasan,  
 Nagpur.  
 R/Sir,  
 Supply following title of books at the earliest.

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

Thanking you,

Date: < Insert System Date >

Yours

Principal  
(Dr. WWW)

Perform Following option

1) Take a printout  
2) Assume Librarian forget to enter one of the entry of book so, kindly add it between number 3 and 4 say,

4 Business Economics Gurbir Kaur Khalsa 10

3) Replace author name S. Kishor by S.B. Kishor at once.

4) Finally print the copy of this document with following settings,

- Left Margin = 1.75"
- Right Margin = 1"
- Top Margin = 1.5"
- Bottom Margin = 1"

7. Using Mail-Merge write a letter to all selected candidate for their final admission on specific date say (30-June) at XYZ Institute, with necessary documents at 10 AM.

Name should be highlighted while course and date of commencing class should be underlined

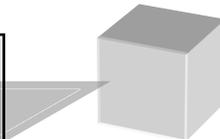
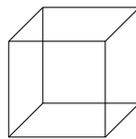
8. Create a document and while saving give a security to open the saved document.

Take a screen shot while opening it.

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



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



### C) LibreOffice Calc/MS-Excel

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

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

Perform following operations:-

1. Complete the table using formulas

- DA = Basic \* 27 %
- Hra = Basic \* 10 %
- PF = Basic \* 12.5 %

- Gross Pay = Basic + DA + HRA
  - Net Pay = Gross Pay – PF
2. Give the Proper Heading.
  3. Take the printout in landscape orientation

2) Enter following data in MS-Excel worksheet.

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

Perform following operations:-

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

3) Prepare following using MS-Excel.

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

Perform following:-

- a. Calculate Average and High score of each player using AVERAGE & MAX function
  - b. Calculate total score of each match using SUM function.
  - c. Sort above records in descending order on the basis of average.
  - d. Take the printout in landscape orientation
- 4) Prepare the Mark sheet of IT subject on the basic of 3 Unit test. Each of 30 Marks and perform following,
    1. Calculate total marks, Average and Grade
    2. Auto format to the above table.
    3. Take the printout
  - 5) Prepare the multiplication using
    - 1) Relative cell reference
    - 2) Absolute cell reference.

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

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

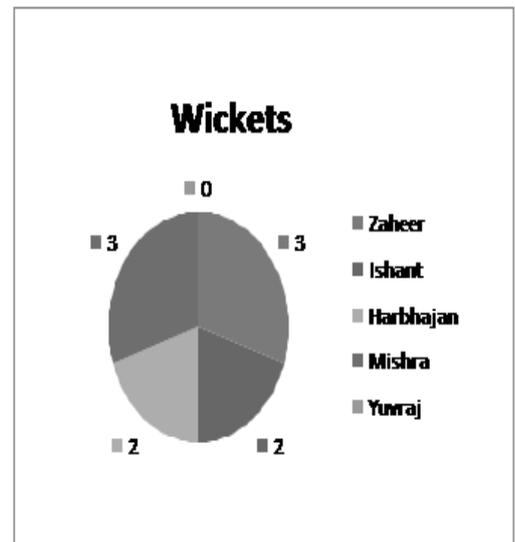
Month	Net Sales	Actual Cost	Profit
Jan. 10	22000	18000	
Feb. 10	245005	9555	
Mar. 10	32450	24850	

Perform following operations:-

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

7) Draw Pie chart of following excel sheet.

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



#### D) LibreOffice Impress/Ms-Powerpoint

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

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

At last, write the steps that you have perform.

2. Create the following slide.

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

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

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

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

### E)‘C’- PRACTICAL

- 1) A program to find simple and compound interest for the rate of interest.
- 2) A program to find corresponding temperature in Fahrenheit from a given temperature in Celsius.
- 3) A program to swap the contents of two variables.
- 4) A Program to accept the distance between two cities in Kilometer and print the distance in meter, feet, inches and centimeter.
- 5) A Program to accept the two sides and angle included by these two sides to find area and third side of a Triangle.
- 6) A Program to check a number is even or odd using conditional operator.
- 7) A program for testing leap year.
- 8) A program to find roots of Quadratic equation  $ax^2+bx+c$ .
- 9) A Program to generate a menu driven program using switch statement.
  1. Add
  2. Edit.
  3. Delete.
  4. Exit.
- 10) A Program to print multiplication Table of a number.
- 11) A program to print number, square and cube of the first 10 natural number.
- 12) A program to find the factorial of an integer number.
- 13) A program to generate and print Fibonacci sequences.
- 14) A program to print first 5 lines of the following pyramid.

```

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

```

- 15) A program to find the GCD of two Positive integers by successive division.

16) A Program to find the number of Armstrong number between 123 to 425

17) A program to print all the prime number between 10 to 100

**Note: Practical should be performed either using Open Source Software (gcc Compiler) 'C' or by using Turbo 'C'.**

# **B.Sc. - I (Computer Science)**

## **SEMESTER – II**

**B.Sc. - I (Computer Science) SEMESTER – II**  
**Paper –I: OPERATING SYSTEM & LINUX**

**[Max. Marks:50**

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**UNIT–I: Introduction to Operating System**

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

**Types of OS:** Concepts of Batch, Multi Programmed, Time Sharing, Parallel, Real Time

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

**Hardware Protection:** Dual Mode Operation, I/O Memory and CPU Protection

**UNIT –II: Operating System Structure**

**System Components:** Process, Main Memory, File I/O System, Secondary Storage Management, Networking, Protection System, Command Interpreter System

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

**UNIT – III: Linux**

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

**Shell:** Bourne, Korn and C-Shells

**File System Commands:** ls, mkdir, rmdir, cd, cat, mv, cp, rm, ln, pwd, more  
Text editing with vi editor

**UNIT –IV: Shell Scripts**

**Pipe and Filters:** sort, grep, egrep **Permission Modes:** chmod, chown, chgrp

**Process:** ps, kill, **Communication**

**Shell Scripts:** Variables, Arithmetic in Shell Script, Control flow statements, Shell Parameters

**Text Books**

- 1) Andrew S.Tanenbaum, “Modern Operating Systems”,PHI.
- 2) Jack Tackett, Jr. and Steven Burnett, “Using Linux”, PHI (5<sup>th</sup> Ed)
- 3) Dr. S. B. Kishor, “Operating System”, Das Ganu Prakashan, ISBN : 978-93-81660-11-9

**References**

- 1) Brain Proffitt, “Red Hat Linux 7”,PHI.
- 2) “Teach Linux in 24 hours”,SAMS Techmedia,ISBN:81-7635-499-6
- 3) Grant Taylor, “Linux Complete” , BPB pub., ISBN : 81-7656-170-3

**B.Sc. - I (Computer Science) SEMESTER – II**  
**Paper-II: STRUCTURED PROGRAMMING WITH ‘C’**

[Max. Marks : 50]

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**UNIT–I: Arrays**

Definition, Initialization of array, Writing and Reading data from an array, Bounce Checking, Searching, Sorting and Merging of two arrays. Two Dimensional Array : Declaring, Initialization, Operation on Matrix : Addition, Multiplication, Transpose etc.

**String:** String Manipulation using string library functions.

**UNIT–II: Structure and Union**

**Structure:** Need of Structure, period operator, Initializing Structure, sizeof(), Arrays of Structure, Nested Structures.

**Unions:** Concept and applications, enum

**UNIT–III: Function and Storage Class**

**Function:** Arithmetic and String Library Function, User defined functions, Advantage of Function, Category of Function, Nesting Function, use of void, Recursion.

Function with Arrays, Passing Structure elements to Functions.

**Storage Class:** auto, static, extern, Register.

**UNIT–IV: Pointer and File Concept**

**Pointer:** Declaring and Initializing pointer variable, Pointer Operator, Call by value and Call by Reference

**Dynamic Memory Management Functions:** malloc( ), realloc(), free()

**Files:** Concept of file, Operation on Files, Defining, Opening and closing files, Modes of Files, file handling function, Command Line Argument.

**Text Books:**

- 1) E. Balguruswami, “Programming in ANSI C”, TMH, 2009, ISBN-978-0-07-06482207/0-0-0-70-0648220-0.
- 2) Dr. S. B. Kishor, “Programming in C”, Das Ganu, 2016, ISBN: 978-93-84336-21-9

**References**

- 1) RAJARAMAN, “Computer Programming in C”, PHI, 2002, ISBN-81-203-0859-X.
- 2) K. R. Venugopal and S. R. Prasad, “Mastering C”, TMH, 2008, ISBN-13:978-0-07-061667-7/10:0-07-06-1667-1.
- 3) Dr. S. B. Kishor, Dr. V. Godki, S. Madhavi, “Gateway to C Programming”, Lambert Pub. Germany, ISBN-9783845414744

**B.Sc. - I (Computer Science)**  
**SEMESTER – II**  
**Practical**

**[Max. Marks : 30**

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**A) PRACTICAL BASED ON LINUX**

- 1) Perform the following Directory Commands  
a) pwd b) ls c) mkdir d) cd e) rmdir
- 2) Perform the following File management Commands  
a. cat b) cp c) ln d) rm e)more f) mv
- 3) A Shell Script to perform various arithmetic operations.
- 4) A Shell Script that takes two numbers from keyboard and display their average as an output.
- 5) A Shell Script to display current date, users who have logged in, process status and calendar of the month.

**B) 'C' – PRACTICAL**

- 1) A program to search an element S among N numbers.
- 2) A program to rotate the list  
For Eg. Before Rotate : 6 7 8 3 4 7  
After Rotation : 7 8 3 4 7 6
- 3) A program to sort the list of N numbers using bubble sort.
- 4) A Program to delete an element from list of N number.
- 5) A Program to find sum of two matrices having size m\*n and p\*q.
- 6) A Program to Transport the matrix of size M\*N.
- 7) A Program to find sum of each row and column of matrix and also find largest and smallest element in the given matrix.
- 8) A program to count number of characters including uppercase and lowercase letter, digits, punctuations, space and words that are entered in a given string.
- 9) A program to define and accept the element of structure
  - 1) Empno
  - 2) Name
  - 3) Basic pay

and display the same structure along with DA, CCA and gross salary.

DA and CCA are calculated as follows.

DA= 91% of basic salary

CCA= RS 100/- consolidation.

10) A Program to enter the marks of 5 subjects of 3 students and also find the total marks of each student using structure with array.

11) A Program to accept the containing 10 number and pass it to function to print it.

12) A program to evaluation following series.

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots + \frac{x^n}{n!}$$

13) A program to sort the list of names using Pointer.

14) A function length() which count the length (number of character in the given string.)

15) A function copystri() which will copy the contents of string into another.

16) A program to simulate DOS TYPE command.

17) A program to count number of characters include uppercase and lowercase latter, digits, punctuations, space, words and number of lines in given file.

18) A program to create data file "Student.dat" having fields, Rollno, Name and Address.

19) A program to read and display the contents of data file "Student.dat".

**Appendix 1**  
**Evaluation Rules**

**A) Internal Assessment:**

1. The internal assessment marks shall be awarded by the concerned teacher.
2. The internal assessment marks shall be sent to the University after the Assessment in the prescribed format and direction by University.
3. General guidelines for Internal Assessment are:
  - a) The internal assessment marks assigned to each theory paper on the basics of the performance in any two assignments as described below selected by concerned teacher.
    1. Class Test / Sessional examination
    2. On-line Test
    3. Theory Assignments
    4. Programming Assignments
    5. Study tour
    6. Industrial visits
    7. Visit to educational institutions and research organizations, field work, Conference etc
    8. Group discussions
    9. Seminar Presentation
    10. Participation in Departmental Activities
  - b) There shall be no separate / extra allotment of work load to the concerned teacher related to above assignments. He/ She shall conduct the Internal assessment activity during the regular teaching days / periods as a part of regular teaching activity.
  - c) The concerned teacher / department / college shall have to keep the record of all the above activities until six months after the declaration of the results of that semester.
  - d) At the beginning of each semester, every teacher / department / college shall inform his / her students unambiguously the method he / she propose to adopt and the scheme of marking for internal assessment.

**B) Practical Assessment:**

**Time:** Minimum 2 Hours 30 Min. for conducting the practical examination subject to the condition the availability of computers and printers at the center.

**Marks Distribution:** A practical mark will be allocated by Internal & External Examiner as per the following format

Sr. No.	Particulars	Max. Marks
a.	Writing, Execution and Printout of Program-I	12
b.	Writing Program-II	06
c.	Practical Record	06
d.	Viva Voce	06
<b>Total</b>		<b>30</b>

**Note:**1) The Written work should be completed within max. 45 minutes.

2) For execution and taking printout max. 45 minutes is reserved.

**C) Theory Paper Assessment:** Theory papers will be held as per the scheduled given by the university and examinee needs to score minimum 35% of marks to clear the paper including internal assessment marks.

**D) Revaluation:** There is also a provision for the Revaluation only for theory papers examination conducted by University (i.e. it is not applicable for Internal Assessment) as per the rules and fee structure prescribed by University.

**Appendix 2**  
**Practical Examination**

1. Each practical carries 30 marks. The scheme of marking shall be as per given in the syllabi of respective subjects.
2. Practical performance shall be jointly evaluated by the External and Internal Examiner. In case of discrepancy, the External Examiner's decision shall be final.
3. Duration of practical examination will be Minimum 2 Hours 30 Min.
4. The Practical Record of every student shall carry a certificate as shown below, duly signed by the teacher-in-charge and the Head of the Department. If the student fails to submit his / her certified Practical Record duly signed by the Teacher-In-Charge and the Head of the Department, he / she shall not be allowed to appear for the Practical Examination and no Marks shall be allotted to the student.
5. The certificate template shall be as follows:

<b>C E R T I F I C A T E</b>
Name of the College / Institution : _____ Name of the Department: _____
This is to certify that this Practical Record contains the bonafide record of the practical work of Mr. / Mrs. / Ku. _____ of B.Sc.(Computer Science) _____ Semester _____ during the academic year _____.
The candidate has satisfactorily completed the practical's prescribed for the course by Gondwana University, Gadchiroli for the subject _____
Dated : __ / __ / _____
Signature of the teacher who taught the examinee
1. _____ 2. _____
Head of the Department

### Appendix-3

#### Pattern of Question Paper

General Rules and Regulations regarding pattern of question paper for the semester end examination is as given below:

1. There will be four units in each paper.
2. Maximum marks of each theory paper will be 50.
3. Question paper will consist of five questions, each of 10 marks.
4. Four questions will be based on four units with internal choice.
5. Fifth question will be compulsory with questions from each of the four units having equal weightage and there will be no internal choice.

<b>Bachelor of Science</b>	
<b>B.Sc. (Computer Science) – [I / II / III] Semester – [I / II/ III / IV / V / VI]</b>	
<b>Paper Code:</b>	<b>Paper: Name of Paper</b>
<b>Time: 3 Hours]</b>	<b>[Max. Marks: 50</b>
<b>Note:</b> 1) All questions are compulsory and carry equal marks. 2) Draw Neat and Labeled diagram and use supporting data wherever necessary. 3) Avoid vague answers and write specific points/answer related to questions.	
<b>Q1 Either (From Unit 1)</b>	
a)	5
b)	5
<b>Or</b>	
c)	5
d)	5
<b>Q2 Either (From Unit 2)</b>	
a)	5
b)	5
<b>Or</b>	
c)	5
d)	5
<b>Q3 Either (From Unit 3)</b>	
a)	5
b)	5
<b>Or</b>	
c)	5
d)	5
<b>Q4 Either (From Unit 4)</b>	
a)	5
b)	5
<b>Or</b>	
c)	5
d)	5
<b>Q5 Solve all questions</b>	
a)(From Unit 1)	$2^{1/2}$
b) (From Unit 2)	$2^{1/2}$
c)(From Unit 3)	$2^{1/2}$
d) (From Unit 4)	$2^{1/2}$

**Gondwana University,  
Gadchiroli**



**Choice Based Credit System (CBCS)**

**Syllabus  
of**

**B.Sc. (Computer Science) - II**

**Semester – III & IV**

**Optional Subject**

**(Three Years Degree Course)**

**Prepared by**

**BOS Computer Science**

**2018-2019**

## B.Sc.-II (Computer Science) SEMESTER-III

<b>B.Sc. (Computer Science) – II (Semester -III)</b>											
Subject	Paper Code	Paper Name	Total Period /Week	Credit	Theory (Th) Assessment				Practical (Prac.)		Total (Th. + Prac.)
					IA	UE	Total	Min. Passing (40%)	UE	Min. Passing (40%)	
Core Course	USCST05	DATABASE MANAGEMENT & SYSTEM ANALYSIS	6T + 1Tu (Per Batch)	6	10	50	60	48 Marks	30	12	150
	USCST06	OBJECT ORIENTED PROGRAMMING WITH C++			10	50	60				

**Note:**

- Student must appear for University Practical Examination otherwise he/she will be treated as fail. However their Internal marks will be carried forward.
- In a Group, if any student remains absent in one of the paper then candidate result will be considered as fail in that group even though he/she has scored minimum passing marks in other paper of that group. Candidate need to appear in both the papers of that group.

**B.Sc.–II  
SEMESTER-III  
(Computer Science)  
USCST05**

**Paper-1: DATABASE MANAGEMENT AND SYSTEM ANALYSIS**

**[Max. Marks: 50]**

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**UNIT–I: Database Environment**

Basic Terminology, Data Processing, Traditional and DBMS Environment, Components of DBMS, Advantages & Disadvantages of DBMS. Three Tier Architecture, Data Abstraction, DBA & Functions. **Data Models:** Record Based Logical Model, Object Based Logical Model.

**UNIT–II: Functional Dependency & Normalization**

Functional Dependency, Normalization, Normal Forms (1NF, 2NF, 3NF, 4NF, 5NF), Relational Database Structure, Relational Algebra, Codd's Rules.

**UNIT –III: System Analysis**

System Definition, Components of System, **System Analysis:** System Development Life Cycle (SDLC), PARIS Model. **Information Gathering Tools:** Sources, Methods (Interviews, Questionnaires, Observation, Document Analysis, etc.). **Tools of Structure Analysis:** Data Flow Diagram, Data Dictionary, Decision Tree, Decision Table, CASE tools.

**UNIT – IV: System Design & Implementation**

**System Design:** System Design Principle, Input Design, Output Design, Form Design

**Implementation:** Testing, Level of Testing, Nature of Test Data, Conversion, User Training, Hardware and Software Selection.

**Documentation:** Types of Documentations, Quality Assurance, Privacy, Disaster Recovery Plan, Maintenance Review

**Text Books:**

- 1) Dr. S.B. Kishor, "Database Management System & Ms-Access", Das Ganu Prakashan, ISBN 978-93-81660-92-8
- 2) R. Panneerselvam, "Database Management System", PHI, 2006, ISBN : 81-203-2028-X
- 3) Dr. S.B. Kishor, "System Analysis & Design", Das Ganu Prakashan, ISBN-978-93-81660-17-1

**Reference Books:**

- 1) Elias Award, "System Analysis & Design", Golgotha Publication, 2nd Edition, ISBN: 81751568-X
- 2) Dr. Madhulika Jain, Vinita Pillai, Shashi Singh and Satish Jain, "Introduction to Database Management", BPB, 2002, ISBN: 81-7656-638-1

**B.Sc.–II  
SEMESTER-III  
(Computer Science)  
USCST06**

**Paper-2: OBJECT ORIENTED PROGRAMMING WITH C++**

**[Max. Marks: 50]**

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**UNIT -I: Elements of Programming and Function**

**Introduction:** Basic Elements of Programming, Console I/O Operations,

**Function:** Function Prototyping, Call and Return By Reference, Inline Function, Default and Constant Arguments, Function Overloading, Arrays, Manipulators and Enumeration.

**UNIT -II: Classes and Object**

**Object Oriented Methodology:** Basic Concepts, Characteristics of OOP. Advantages and Application of OOPs, Procedural Programming Vs OOP.

**Classes and Objects:** Specifying a Class, Creating Objects, Private & Public Data Members and Member Functions, Defining Inline Member Functions, Static Data Members and Member Functions. Arrays within Class, Arrays of Objects, Objects as Function Arguments, Returning Objects.

**UNIT -III: Constructors, Destructors, Operators Overloading and Inheritance.**

**Constructors and Destructors:** Introduction, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Dynamic Constructors, Const Objects, Destructors

**Operators Overloading:** Definition, Unary and Binary Overloading, Rules for Operator Overloading.

**Inheritance:** Defining Derived Classes, Types of Inheritance, Constructors and Destructors In Derived Classes.

**UNIT -IV: Pointers Virtual & Friend functions and file handling**

**Pointers:** Pointer to Objects, this Pointer, 'New' and 'Delete' Operators, Virtual Function, friend Functions. Opening, Closing A File, File Modes, File Pointers and Their Manipulation,

**Sequential Input and Output Operations:** Updating A File, Random Access, and Error Handling During File Operations, Command Line Arguments.

**Text Books:**

- 1) K.R.Venugopal, Rajkumar, T. Ravishankar, "Mastering C++", TMH ,ISBN:0-07-463454-2.
- 2) Dr. S.B. Kishor, "Object Oriented Programming with C++", Das Ganu Prakashan, ISBN-978-93-84336-24-0
- 3) Farrel,"Object-Oriented Programming using C++",Cenage Pub, ISBN: 9788131505175

**Reference Books :**

- 1) D Ravichandran, "Programming with C++", Tata McGraw Hill Publishing Company Limited, New Delhi, ISBN 0-07-049488-6
- 2) E Balagurusamy, "Object Oriented Programming with C++ ", Tata McGraw Hill Publishing Company Limited, New Delhi, ISBN:- 13- 978-07-066907-9

**B.Sc.–II**  
**SEMESTER–III**  
**(Computer Science)**  
**Practical-1: MS-ACCESS**

- A] Create table Student (Student no, Student name, and Course) in MS-ACCESS with the following details and perform following operations.

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

1. Use Column width as best fit.
2. Set Student no as a Primary Key.
3. Insert at least 10 students' records.
4. Display all the students whose name begin with letter 'S'.
5. Display the query view and take out the print out.
6. Add new fields such as Fees, Date\_adm ,Date\_of\_birth, .Address)
7. Add data to above newly fields.
8. Select Student name, Course and Fees from student table.
9. Delete all the students who were admitted on specific date.
10. Update fees to increase it by thrice.
11. Select all the students of VB.NET paying course fees of 4000.
12. Update table by replacing the course name to TALLY wherever the course fees is 3500.
13. Delete the record where Student name is SONAM.
14. Display the student name, student no who was born on '14/6/1996'
15. Replace the Address of student say, ANSHU to PUNE.
16. Remove all the records where number of students is less than 2 for particular course.

- B] Create the Tables in which

Stud\_per\_Detail(Stud\_no, Stud\_name, Sex, date\_of\_birth, Address, Ph\_no) and  
Stud\_off\_detail(Stud\_no, Course, Fees, date\_Adm).

1. Select Stud\_Name, Address from Stud\_Per\_Detail and Stud\_no, Course, Fees from Stud\_off\_datail.
2. Create a report view for above query.
3. Append the records of above tables Stud\_Per\_Detail to Stud\_History where StudentDate\_of\_Birth i s 14/06/1996.
4. Print the table design view and datasheet view.

- C] Create a table Donar(Donar\_no, Donar\_name, BG, Sex) by using following instruction.

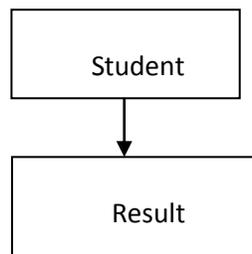
1. Use Columnar Layout.
2. Use Blueprint style.
3. Give the title for Form as Donar Details Form.
4. Enter 5 records.
5. Print the Form view.

**B.Sc.–II  
SEMESTER–III  
(Computer Science)**

**Practical-2: OBJECT ORIENTED PROGRAMMING WITH C++**

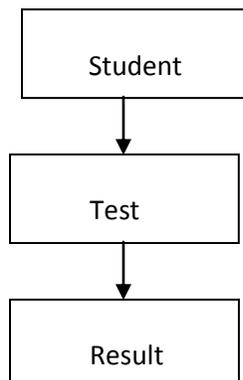
1. Design inline functions for add and multiply of two integer numbers.
2. Write a cpp program to overload “sum()” function for add two integers, to add three real and add three integers.
3. Write a ‘C++’ program to demonstrate the concept of Call & Return by reference.
4. Write a ‘C++’ program to demonstrate the concept of Default argument.
5. Design a class “Complex” with real and imaginary members also design appropriate member function to get and print complex numbers.
6. Design a class “ Time” with hours and minutes as data members and to get and print data of Time class also design a sum() with object as arguments to add two objects of Time class.
7. Design a class “Employee” with appropriate members. Demonstrate array of objects.
8. Write a ‘C++’ program to demonstrate Static Data Members and Member Functions.
9. Create a class “ Complex” with real and imaginary members and to initialize them write overloaded constructor for i) Default constructor ii) Constructor with one parameter iii) Constructor with two parameters.
10. Write a ‘C++’ program to overload unary ‘++’ and ‘- -’ operator for “Sample” class with X,Y, Z of integer type
11. Write a ‘C++’ program to overload binary ‘+’ operator for adding two complex numbers.
12. Write a ‘C++’ program to Single inheritance for following structure.

Student Class (rollno, sub1, sub2) and Result Class (total, avg)



13. Write a class for Multilevel Inheritance for following structure

Student Class (rollno), Test Class(sub1,sub2), Result Class(total, avg)



14. Write a program in 'C++' for overriding of show( ) and display( ) function.  
Demonstrate use of virtual function for runtime polymorphism.
15. Write a program in 'C++' which demonstrates the pure virtual function.
16. Write a 'C++' program which read contents from file and counts number of vowels and consonants in a file.
17. Write a 'C++' program which counts number of command line arguments on command line.
18. Write a 'C++' program which demonstrates use of this pointer.

# B.Sc.-II(Computer Science)

## SEMESTER-IV

<b>B.Sc.(ComputerScience)–II(Semester-IV)</b>											
Subject	Paper Code	Paper Name	Total Period /Week	Credit	Theory(Th) Assessment			Min. Passing (40%)	Practical (Prac.)		Total (Th. + Prac.)
					IA	UE	Total		UE	Min. Passing (40%)	
Core Course	USCST07	ALGORITHM & DATA STRUCTURES	6T + 1Tu (Per Batch)	6	10	50	60	48 Marks	30	12	150
	USCST08	VISUALBASIC & INTRODUCTION TO .NET			10	50	60				

**Note:**

- Student must appear for University Practical Examination otherwise he/she will be treated as fail. However their Internal marks will be carried forward.
- In a Group, if any student remains absent in one of the paper then candidate result will be considered as fail in that group even though he/she has scored minimum passing marks in other paper of that group. Candidate need to appear in both the papers of that group.

**B.Sc.-II  
SEMESTER-IV  
(Computer Science)  
USCST07**

**Paper-1: ALGORITHM & DATA STRUCTURES**

**[Max. Marks: 50]**

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**UNIT-I : Introduction to Data Structure**

**Data Structure and Algorithms:** Introduction to Data Structures, Fundamentals of DS, Operations on Data Structures.

**Sorting Methods :** Bubble Sort, Insertion Sort, Selection Sort, Merge Sort

**Searching:** Definition, Types of Searching (Binary Search, Linear Search.), Complexity of algorithms.

**Stack:** Introduction & Definition, Application of Stack, Various Representation of Stack, Operation on stack (PUSH and POP), Representation of Arithmetic Expression (Infix, Postfix, Prefix), Multiple Stack, Evaluation of Postfix Expressions and their Conversions.

**UNIT-II: Recursion and Queue**

**Recursion:** Introduction, Recursion Properties, Applications of Recursion (Factorial, Addition of Two Numbers, Power of a Number, Fibonacci Series, Multiplication of Two Numbers)

**Queues:** Introduction, Representations of Queue, Operations on queue, Circular Queue, Priority Queue, Concept of Double Ended Queue.

**UNIT-III: Linked List**

**Linked List:** Introduction, Representation of Linked List, Operations on Linked List (Inserting, Removing, Reversing and Searching). Double Linked List – Insertion and Deletion

**UNIT-IV: Tree and Graphs**

**Trees:** Introduction, Binary Tree, Memory Representation of Binary Tree, Types of Binary Tree, Traversal of Binary Tree, Binary Search Tree (BST), Expression Trees,

**Graphs:** Definition of Graph, Various Terminology Used in Graph, Sequential Representation of Graph, Path Matrix, Spanning Tree and Minimum Spanning Tree (Kruskal Algorithm, PRIM'S Algorithm), Traversing a Graph.

**Text Books:**

- 1) Lipschutz Schaum's "Data Structure", Outline Series [TMH]. ISBN-0-07-060168-2
- 2) Dr. S.B. Kishor, "Algorithm & Data Structures", Das Ganu,

**Reference Books:**

- 1) D. Samanta, "Classical Data Structure", Prentice Hall India, ISBN: 8120318749

**B.Sc.-II**  
**SEMESTER-IV**  
**(Computer Science)**  
**USCST08**

**Paper-2: VISUAL BASIC & INTRODUCTION TO .NET**

**[Max. Marks: 50]**

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**UNIT-I: Introduction to Visual Basic**

**Integrated Development Environment (IDE):** Features, Event driven programming, **Programming Constructs:** Data Types, Variable, Constant, Operators, System defined Functions, Dialog Box and Creating User Interface.

**Control flow statement:** if-then, select-case, for-next, while-wend, do-loop statement, With-End With, Type of Event.

**UNIT-II: VB Control and Procedure**

**Visual Basic Control:** Form, Label, Textbox, Frame, Checkbox, Option Button, ListBox, ComboBox, Timer, Scrollbar, Picture, Image, File Controls, Artwork Control.

**ActiveX Control:** Tab Strip, Status Bar, Slider, Month View, DTPicker, Common Dialog

**Procedure:** Types of Procedure, Subroutine, Function, Module

**UNIT-III: Interface, Array and ActiveX Data Object**

**Interface:** SDI, MDI

**Array:** One Dimensional Array, Built-in Array function, For-Each Loop, Array Types

**ActiveX Data Object :** Data & ADODC Control, Connecting ADODC to Bound Control, Use of ADO Object, ADO Architecture, ADO Object Methods for Editing, Updating and Searching.

**UNIT-IV: Introduction to .NET :**

Basic functionality of CLR, MSIL, CTS & CLS, Common Language Implementation, .NET Languages, Namespaces & Assemblies, Garbage Collection.

**Visual Studio.NET :** WPF Designer and Windows Form Integration, Multi-Framework Targeting, Better Intelligent Support, Refactoring and Enhancements, Visual Studio Split View, Debugging the .NET Source Code.

**Text Books:**

- 1) Paul Sheriff, "Visual Basic 6", Eastern Economy Edition, ISBN-81-203-1562-6
- 2) Dr. S.B. Kishor, "Front End Development using Visual Basic", Das GanuPrakashan, ISBN 978-93-81660-0-5
- 3) Jeffrey Shapiro, "Visual Basic.NET: The Complete Reference", McGraw-Hill, ISBN-0-07-213381-3

**Reference Books:**

- 1) Prosenjit Sinha, "Visual Basic Complete", S. Chand & Company Ltd., ISBN-81-219-2345-X
- 2) Dan Rahmel, "Visual Basic .NET (Programmer's Reference)3rd Edition", McGraw-Hill, ISBN-0-07-219534-7

**B.Sc.–II**  
**SEMESTER-IV**  
**(Computer Science)**  
**Practical based on : DATASTRUCTURES**

- 1) To delete an element from  $K^{\text{th}}$  position of Array.
- 2) To insert an element ITEM at  $K^{\text{th}}$  position of Array.
- 3) To insert an element Item in Sorted Array.
- 4) To implement the operation of Push, Pop and to know the status of stack.
- 5) An algorithm to check the status of stack.
- 6) To find factorial of a number using Recursion.
- 7) To find multiplication of two numbers using Recursion.
- 8) To simulate the game of Tower of Hanoi using recursion.
- 9) To implement the operation of insertion and deletion on Queue.
- 10) A menu driven program to implement the operation of addition, deletion, searching, traversing, reversion, sorting, counting number of nodes and at the end erasing the link list.
- 11) Implementation of stack using linked list.
- 12) Implementation of Queue using linked list.
- 13) To create binary search tree, traverse it and find number of leaves and total nodes in the Tree.
- 14) To arrange the list of numbers in a Sorted order using Merge Sort.
- 15) To arrange the list of numbers in the Sorted order using Quick sort.
- 16) To check all the elements of list are in sorted order or not.
- 17) To search an element using sequential or linear search. At the end display time required to search an element including number of comparisons.
- 18) To search an item position in sorted list (Binary search).

## Practical based on: VISUAL BASIC & INTRODUCTION TO .NET

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1. Build application that collect marks for five different subjects. If total is  $\geq 500$  display message "You are allowed" otherwise display "You are not allowed."

A book stall gives discount on the books as per the following conditions, No. of Books Purchased

	Discount	
1.	$\leq 5$	Nil
2.	$> 5$ and $\leq 10$	10%
3.	$> 10$ and $\leq 15$	12%
4.	$> 15$	20%

Create a form as follows to calculate the Discount

2. Build the VB application that converts a number entered into the Text box to Octal, Hexadecimal and Decimal.
3. Build the application to accept the password with in time limit say 8 seconds otherwise display a message time elapsed.
4. Build the application using timer for personal appointment remainder while working with computer system.
5. Evaluate following  $\sin(x)$  series
  - i.  $\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \dots$
6. Build the application, to change the color of Frame using RGB function from the values that are set by 3 Scroll bars.
7. Build a Calculator application to perform basic arithmetic operation
8. Build the application, to accept the temperature of Number of days passed in the current month and determines the highest and average temperature.
9. Demonstrate the working of data bound controls
10. Create a data bound control application to perform various data operation using ADO Control. Assume Database Name and Table Name is Donor having 4 fields Donor\_Number, Donor\_Name, Date\_of\_Birth, Donor\_Blood and Sex.
11. Create a data bound control application to perform various data operation using ADO Control. Assume Database Name and Table Name is Donor having 4 fields Donor\_Number, Donor\_Name, Date\_of\_Birth, Donor\_Blood and Sex.
12. Write an application to divide the number by another and it must be able to handle any error that may arise during run time.

**Following Program Should be Performed using VB.Net**
13. Design a form to accept First, Middle and Last Name and display the full name (Concatenate three text box) on Label when user click on Command Button.
14. Design an application that gives five choices of colors. Design an application to choose any one color using option button and change the Fore Color of Textbox.
15. Write an application to add and remove the name of city from combo box
16. Design a VB.Net screen, to display current time in digital format continuously after every one second and change the background color of form.
17. Build the VB. Net application, which marquee the caption of Form.

Build the VB. Net application, to convert the Fahrenheit temperature selected through scrollbar value into corresponding temperature in Celsius.

# **Gondwana University, Gadchiroli**



## **Choice Based Credit System (CBCS) Syllabus of B.Sc. (Computer Science) - III Semester – V & VI Optional Subject (Three Years Degree Course) 2019-2020**

**B.Sc.-III (Computer Science)  
SEMESTER-V**

<b>B.Sc.(Computer Science)– III (Semester-V)</b>											
Subject	Paper Code	Paper Name	Total Period /Week	Cre dit	Theory(Th) Assessment			Practical (Prac.)		Total (Th +Prac)	
					IA	UE	Total	Min. Passing (40%)	UE		Min. Passing (40%)
<b>Discipline Specific Elective Course (DSEC-I)</b>	USCST09.1	<b>(Select any Two)</b> <ul style="list-style-type: none"> <li>• E-Commerce &amp; Web Designing</li> <li>• Database Programming with Oracle</li> <li>• Scripting Languages</li> <li>• Software Engineering</li> </ul>	6T + 1Tu (Per Batch)	6	10	50	60	<b>48</b>  <b>Marks</b>	<b>30</b>	<b>12</b>	<b>150</b>
	USCST09.2										
	USCST09.3										
	USCST09.4				10	50	60				
<b>Skill Enhance ment Course (SEC-I)</b>	USCST010.1	<b>(Select Any One)</b> <ul style="list-style-type: none"> <li>• Computers for Managers</li> <li>• A Certification Course from IIT Spoken Tutorial, Mumbai</li> <li>• Personality Development</li> <li>• Accounting &amp; Office Management</li> </ul>	1	2				<b>20</b>	--	--	--
	USCST010.2										
	USCST010.3				50	--	50				
	USCST010.4										

\*Student must appear for University Practical Examination otherwise he/she will be treated as fail. However their Internal marks will be carried forward.

**Note:- In a Group, if any student remains absent in one of the paper then candidate result will be considered as fail in that group even though he/she has scored minimum passing marks in other paper of that group. Candidate need to appear in both the papers of that group**

**B.Sc.–III**  
**SEMESTER–V**  
**(Computer Science)**  
**PAPER-9.1(Elective I) :E-Commerce & Web Designing**  
**[Max. Marks: 50]**

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**UNIT-I: Introduction to E-Commerce**

Introduction, Definition, e-Commerce and Thread Cycle, Benefits, Applications, e-Commerce Implementation, Electronics Market, Usage of e-Market, Advantages and Disadvantages of e-Market, Future of e-Market.

**UNIT-II: Basic of HTML and Tag**

**Introduction to HTML** - Introduction, Features of HTML, Advantages & Disadvantages of HTML, HTML Editors, Step to Create and View HTML Document, Basic Structure of HTML Program **Tags & Attributes**- Nesting of Tags, Classification of HTML Tags, Block Formatting Tags. **List** - Introduction to Lists, Unordered List, Ordered List, Definition List, Nested List, Difference Between Ordered and Unordered List.

**UNIT-III: Working with HTML**

**Linking** - Introduction, Type of Hyperlink Creation, Working with Links, Pathname and Types, Types of Linking or Anchors. **Graphics in Web Page** - Image Tag, Align Images, Embedding Inline Images and External Images. **Tables** - Basic table tags and their related attribute **Frames**- Frames, <Frame> and <Frameset> tags and related attributes.

**UNIT-IV: Advanced HTML**

**Form designs**, Form Controls, Text controls, password fields, radio buttons, and check boxes. Reset and submit buttons, form control selection, option processing and text area. **Introduction to CSS**: Concept of CSS, Creating of Style sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects, Working with Lists and Tables, CSS Id and Class, Box Model (Introduction, Border properties, Padding Properties, Margin properties).

**Books:**

- 1) Dr. S.B. Kishor, "E-Commerce & Web Designing", Das GanuPrakashan, ISBN-978-93-81660-52-2
- 2) C.Xavier, "Web Technology and Design", TMH, 2010, ISBN-13:978-81-224-1450-9
- 3) Thomas Powel, "HTML & CSS: The Complete Reference", Fifth Edition, McGraw-Hill, ISBN-978-0-07-174170-5

**References:**

- 1) Complete HTML, BPB, 2010, ISBN-13:978-0-07-070194-6.
- 2) David Whitely, "e-Commerce- Strategy, Technology and Applications", McGraw Hill Education, ISBN-13: 978-0-07-044532-1
- 3) Jon Duckett, "HTML and CSS: Design and Build Websites", John Wiley & Sons Inc., ISBN-978-1-118-00818-8

**B.Sc.–III  
SEMESTER–V  
(Computer Science)  
PAPER-9.2(Elective II): DATABASE PROGRAMMING WITH ORACLE**

**[Max. Marks: 50]**

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**UNIT – I: Introduction**

RDBMS Concept, Introduction to Oracle, SQL Tools, Oracle as multi-User System, SQL, SQL \*Plus, Getting Started with SQL, Writing SQL Commands, Components of SQL, Data Types, Database Users, Database Objects, Elements of SQL.

**UNIT – II: SQL Languages**

**Data Definition Language :** Creation of Table, Viewing table Structure, Data Integrity through Constraints, Altering Table, Dropping Table, Truncating Table. **Data Retrieval:** Select Command, SQL Operators, Clauses- Group by Clause, Having Clause, Order By Clause. **DML Operation:** Insert Update and Delete. **Transaction Control Language:** Commit, Rollback, SavePoint. **Data Control Language:** Grant, Revoke.

**UNIT - III: SQL Function and Database Objects**

**Sql \*functions:** Character Function, Case Manipulation, Numeric Functions, Date Function, Conversion Function, Conditional Functions, Nested Functions, Group Functions. **Database Objects:** Views, Sequence, Synonym. **Joins, Clusters, Set Operators, Locks and Sub query.**

**UNIT - IV: PL/SQL**

Basic Elements of Programming, Select. Into Statement, Exception Handling: Predefined Exception, When Other Exception, Cursor: Explicit Cursor, Explicit Cursor Attributes, Subprogram and Packages, Types used in Packages, Triggers.

**Books:**

- 1). Kevin Loney, Marlene Theriault, "Oracle 9i: DBA Handbook", TMH, ISBN: 78-0-07-048674-4.
- 2) Dr. S.B. Kishor, "Oracle (PL/SQL) Programming", Das GanuPrakashan, ISBN 978-81-921757-5-1
- 3) Ivan Bayross, " Oracle Developer 2000", BPB, 2006, ISBN : 8/7029-899-7

**References:**

- 1) Paul Hipsley, "Developing Client / Server Applications with oracle Developer/2000 TM", Techmedia, 1997, ISBN – 81-87150-02-X
- 2) Ivan Bayross, " Commercial Application Development using Oracle Developer 2000 Forms 6i", BPB, 2003, ISBN : 81-7656-742-6

**B.Sc.–III  
SEMESTER–V  
(Computer Science)  
PAPER-9.3(Elective III): SCRIPTING LANGUAGES**

**[Max. Marks: 50]**

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**UNIT I: INTRODUCTION TO JAVA SCRIPT**

Features of JavaScript, Structure and Basic Syntax of JavaScript, Data Types, Operators Supported By JavaScript, Control Structure, Dialog Boxes Supported By JavaScript, Functions In JavaScript Built In Function, User Defined Function, Recursion, Arrays. **JavaScript Document Object Model** - Built-In Objects In JavaScript, String Object, MathObject, Date Object, Boolean Object, Number Object, User Defined Objects, Handling (WEB PAGE) Events Using JavaScript.

**UNIT II: INTRODUCTION TO VBSCRIPT**

Features of VBScript, Data Types in VBScript, Elements of VBScript: Identifiers, Operators, Control Statements, Control Structure. **Functions** - Variant Function, Math Function, Formatting Function, String ManipulationFunction, Type Conversion Methods Supported By VBScript, Arrays in VBScript, Regular Expression.

**UNIT III: CSS**

Creating Style Sheet, CSS Properties, CSS Styling(Background, Text Format, ControllingFonts) Working with Block elements and Objects, Working with Lists and Table, CSS Id and Class Box Model(Introduction, Border properties, Padding Properties, Margin properties),CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector),CSS Color Creating page Layout and Site Designs.

**UNIT IV: INTRODUCTION TO XML**

What is XML, XML verses HTML, XML Terminology, XML Standards,XML Syntax Checking, the idea of mark-up, XML Structure, Organizing information in XML, Creating well-formed XML, and XML Namespaces. **DTD** - Introduction to DTD, Document Type Declaration, Element Type Declaration, Attribute Declaration, Conditional Section, Limitations of DTD.

**Books:**

- 1) Dr. S.B. Kishor, S.S. Gudelliwar, Dr.Rajani D. Singh, “WEB DESIGNING (HTML, JAVA SCRIPT & VB SCRIPT”, Das GanuPrakashan, ISBN- 978-93-81660-05-08.
- 2) Beginning CSS: Cascading Style Sheets for Web Design, Wiley India, author Ian Pouncey, Richard York, and ISBN: 978-0-470-89152-0.

**References:**

- 1) NIIT, “Building Web Application”, Prentice Hall of India, ISBN 81-203-2714-4.
- 2) Lee Purcell, Mary Jane Mara, “The ABCs of JavaScript”, ISBN 81-7029-826-1.

**B.Sc.–III  
SEMESTER–V  
(Computer Science)  
PAPER-9.4(Elective IV): SOFTWARE ENGINEERING**

**[Max. Marks: 50**

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**UNIT - I: INTRODUCTION TO SOFTWARE ENGINEERING**

**Introduction to Software Engineering:** The Evolving Role of Software, Changing Nature of Software, Software myths. **A Generic view of process:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

**UNIT - II: PROCESS MODELS**

**Process Models:**The waterfall model, Incremental process models, Evolutionary process models, The Unified process. **Software Requirements:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. **Requirements engineering process:** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

**UNIT - III: SYSTEM MODELS**

**System Models:**Context Models, Behavioral models, Data models, Object models, structured methods. **Design Engineering:** Design process and Design quality, Design concepts, the design model. **Creating an architectural Design:** Software architecture, Data design, Architectural styles and patterns, Architectural Design.

**UNIT - IV: TESTING STRATEGIES**

**Testing Strategies:**A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. **Product metrics:** Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance. **Metrics for Process and Products:** Software Measurement, Metrics for software quality.

**Books:**

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.
3. Software Engineering- K.K. Agarwal&Yogesh Singh, New Age International Publishers

**Reference:**

1. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, John Wiely.
2. Systems Analysis and Design- ShelyCashmanRosenblatt,Thomson Publications.
3. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies

**(Select Any One)**  
**B.Sc.–III**  
**SEMESTER–V**  
**(Computer Science)**  
**Paper -10.1(Elective I) -: Computers for Managers**

**[50 Marks**

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**Unit I**

History of Internet, Internet Applications, Introduction to MIS, Structure of MIS, ERP, CRM, SCM.

**Unit II**

Business Intelligence, Business Analytics: Online Analytical Processing Reporting and Querying, Online Analytical Processing.

**Unit III**

Data Text Web Mining and Predictive Analytics, Text Mining, Web Mining, Predictive Analytics.

**Unit IV**

Data Visualization, Geographic Information Systems (GIS), Virtual Reality, Real-Time Business Intelligence (BI), Competitive Intelligence (CI), the Role of Scorecards and Dashboards in Performance Management.

**Books:**

1. Computer for Manager, Dr. S. B. Kishor, Dr. Niyaz Sheikh, Dr. ChitraDhawale, Dr. Rajani Singh, Publication Das Ganu
2. System Analysis and Design, E. Award, 2<sup>ND</sup> Edition, Galgotia Publication.

**B.Sc.–III  
SEMESTER–V  
(Computer Science)**

**Paper -10.2(Elective II) -: A Certification Course from IIT Spoken Tutorial, Mumbai  
[Max. Marks: 50**

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**Enroll and Select any one course from IIT Spoken Tutorial, Mumbai**

**B.Sc.–III  
SEMESTER–V  
(Computer Science)  
Paper -10.3(Elective III) -: Personality Development**

**[Max Marks: 50**

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**UNIT- I SPOKEN ENGLISH BASIC COURSE**

Improve accuracy in Grammar, Expand vocabulary, Tenses, Prepositions, Modals, Voices, Direct/Indirect Speech, Adverbs, Adjectives. **Interpersonal skills:** Introduction to Interpersonal Relations, Analysis of Life position.

**UNIT-II COMMUNICATION SKILLS**

Introduction to Communication, Flow of Communication, Listening, Barriers of Communication, How to overcome barriers of communication. **Stress Management:** Introduction to Stress Causes of Stress, Impact Management Stress, And Managing Stress.

**UNIT –III GROUP DYNAMICS &TEAM BUILDING**

Group Dynamics, Importance of groups in organization, Team Interactions in group, How to build a good team? **Personality Development:** Inner Personality Development, Role of motivation & body language, Filling the GAP- Grooming, Attitude, Personality. **Creative Thinking:** Express creativity in everyday situations, know the creative thinking process, and develop a positive attitude.

**UNIT-IV BUSINESS WRITING**

Use of Simple structure while writing, apply a positive tone in business communication. **Time Management:** Time as a Resource, Identify Important Time, Management Wasters, Techniques for better Time Management. **Motivation:** Introduction to Motivation, Relevance and types of Motivation.

**Books:**

- Vijay Agrawal, "Personality Development for Students", Paperback, 1<sup>st</sup>Ed<sup>n</sup>, ISBN:9789382419259,938241925X
- Sourav Das , " The Personality Development Book"

**Reference:**

- BarunMitra , "Personality Development and Soft skills", Oxford publications
- "Soft skill Development", SaiJyoti publications, Prashant A. Dhanwalkar, S.R.Sharma, Gunjan Sharma

**B.Sc.–III**  
**SEMESTER–V**  
**(Computer Science)**  
**Paper -10.4(Elective IV) -: ACCOUNTING & OFFICE MANAGEMENT**  
**[Max. Marks: 50**

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**UNIT I: CONCEPT OF OFFICE MANAGEMENT**

Meaning and definition of office, Importance of office, Functions of Modern office, Sections and function of office departments, Meanings and definitions of Management, Functions of management, Meaning and definitions of office management, Approach of office management 1) Conventional office Management 2) Artistic office management 3) Scientific office management, Principles of office management, Functions of office management.

**UNIT II: OFFICE ORGANIZING**

Meaning and definition of office organization, Importance of office organization, Principles of office organization, Types of office organization, Meaning and definition of Delegation of Authority, Responsibility, Importance, features and factors of delegation of authority and responsibility, Principles of Delegation of Authority and responsibility, Problems in Delegation of Authority and responsibility, Job specialization, Job analysis and Job description, Meaning and Importance of organizational Relationship, Meaning of Span of Authority, Informal Organization, Conflict in Organization, Causes of organizational change.

**UNIT III: OFFICE COMMUNICATION**

Meaning and definition of Communication, Importance of Communication, Features of Communication, Elements of Communication, Scope of Communication, Types and Media of communication, Principles of communication, Barriers in communication, Meaning, definition and principles of coordination, Relation between coordination and communication.

**UNIT IV: OFFICE MANUALS**

Meaning and definition of office Manuals, Purpose of office manual, Importance of office Manual, Types of Office Manual, Manual in use, Contents of Office manuals, Sources of Manual materials, Procedure of preparation of Office manual, Distribution revision and maintenance of office manuals, Evaluation of Office manuals, Advantages and Disadvantages of office manual, By use & purpose, Primary memory & Secondary memory, Input and output Devices, Merit and Demerit of computer, MS – Word, Excel, PowerPoint, Meaning, Applications Features Merit and Demerit, Introduction of Internet, Email- Creating receiving & sending Email.

**Books**

- 1) Introduction to Computers, Dr Darrell W Hajek, ISBN-10: 1545236461
- 2) Bank Financial Management,

**B.Sc.–III**  
**SEMESTER–V**  
**(Computer Science)**  
**Practical based on WEB DESIGNING**

- 1) Demonstrate of Logical and physical (Formatting) style tags
- 2) Demonstration of Level of Headings and Block Alignment
- 3) Demonstrate the Font Face, Color and Size. And address tag
- 4) Demonstrate the HR Tag and Alignment
- 5) Demonstrate Ordered and unordered list
- 6) Demonstrate for internal linking
- 7) Demonstrate the use of table
- 8) Demonstration of browsing by category
- 9) Program for designing a simple form
- 10) Demonstrate the Master page to link another page
- 11) Demonstration of Link to Web Page
- 12) Demonstration of Compose Mail
- 13) Demonstrate to show or load inline image say waterfall.JPG
- 14) Demonstrate of Image Hyperlink
- 15) Demonstration of cell padding attributes
- 16) Demonstrate the use of element selector, id selector and class selector with CSS
- 17) Create a Navigation (with Dropdown) with CSS
- 18) Create a CSS Grid
- 19) Style the element which is not empty with CSS
- 20) Create a CSS based Zebra Striped table

## PracticalbasedonDATABASE PROGRAMMING WITH ORACLE

- 1) Create following Tables and Execute the respective PL/SQL blocks.
  - i. Create table employee with the fields (empno,ename,job, hiredate, jadata&sal).
  - ii. Create table Math with fields (numb, square, cube &square\_root).
  - iii. Create table Patient with fields (pname, age, prescription).
  - iv. Create table Musicalbum with fields (title, hero, singer, qth).
  - v. Create table Stu with fields (name & marks).
  - vi. Create table errorh with fields (error\_no& description).
  - vii. Create a table DONAR where following fields(Donar no., donar name, city, age, Sex, Blood group, quantity of blood given, date of donation)
- 2) Write a PL/SQL block to accept employee number and display his/her job, joining date and salary of employee. Define the variable using %rowtype.
- 3) Write a PL/SQL block to accept three paper marks and display result if student scores more than 35 marks in each paper and also specify the class.
- 4) Write a PL/SQL block to find the square, cube, square root of nos.bet 1 & 25 using loop.
- 5) Write a program to divide a number by character number. If any error occurs it should be handled properly, and store the error number and its description in a table called error.
- 6) Write a PL/SQL block to accept and insert a valid data into the table patient. Write appropriate user defined exception.
- 7) Write a PL/SQL block, to display only title and quality of all album stored in the table MusicAlbum.
- 8) Write a PL/SQL block to delete the records from table MusicalAlbum where quantity is less than 4 using cursor.
- 9) Write a procedure to swap two numbers.
- 10) Write a function which is able to perform addition of two numbers.
- 11) Write a function which is able to perform addition of two numbers as well as addition of three number using default argument concepts.
- 12) Write a package, which contains two procedures.
- 13) Write trigger before inserting or updating a name into the table stud name will be automatically converted into uppercase.
- 14) Write a trigger on a table stud, that whenever user try to insert a marks of math either less than zero or greater than 100 a trigger must fire before insertion or updating of records.
- 15) Write a PL/SQL block to accept donor name and display the information of donor. If duplicate or no donor found then proper exception should be raised.
- 16) Create a procedure that displays the information of donor by accepting donor number.
- 17) Write a trigger which will not allow the user to work on table DONAR during period say 9 am to 9:30 am, on any day.
- 18) Use DONAR table and write a PL/SQL block to accept donar number and display the donar detail and find how many days it pass from the last donation.
- 19) Write a program to insert values into a table stud. Write a PL/Sql , main program to call the procedure stud insert.

## B.Sc.(ComputerScience)– III(Semester-VI)

Subject	Paper Code	Paper Name	Total Period /Week	Credit	Theory(Th) Assessment			Practical (Prac.)		Total (Th +Prac)	
					IA	UE	Total	Min. Passing (40%)	UE		Min. Passing (40%)
Discipline Specific Elective Course (DSEC-IV)	USCST11.1	(Select Any Two) • CORE JAVA • DATA COMMUNICATION WITH CLOUD COMPUTING • PYTHON PROGRAMMING • SOFTWARE TESTING	6T + 1Tu (Per Batch)	6	10	50	60	48 Marks	30	12	150
	USCST11.2				10	50	60				
USCST11.3											
USCST11.4											
Skill Enhancement Course (SEC-IV)	USCST012.1	(Select Any One) • Media Management • A Certification Course from MOOC • E- Waste Management • PC- Maintenance	1	2	50	--	50	20	-	-	-
	USCST12.2										
	USCST12.3										
	USCST12.4										

\*Student must appear for University Practical Examination otherwise he/she will be treated as fail. However their Internal marks will be carried forward.

**Note:- In a Group, if any student remains absent in one of the paper then candidate result will be considered as fail in that group even though he/she has scored minimum passing marks in other paper of that group. Candidate need to appear in both the papers of that group**

**(Select Any Two)**  
**B.Sc.–III**  
**SEMESTER–VI**  
**(Computer Science)**  
**PAPER-11.1 (Elective I): CORE JAVA**

**[Max. Marks: 50]**

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**UNIT – I: Introduction to Java**

History of Java, Features of Java, JDK Environment, Java Virtual Machine, Garbage Collection

**Programming Concepts:** Identifiers and Keywords, Data Types in Java, Expressions in Java, Control structures, decision making statements, Arrays and its types.

**UNIT – II: Objects and Classes**

Object Fundamentals and Classes, Pass by value, ‘this’ reference, Data Hiding, Overloading, Overriding, Constructors, Finalization, Subclasses (Inheritance), Relationship between super class object and subclass object. **Language Features:** Scope rules, Static data, Static methods, Static blocks, Modifiers of Class, Method, Data Members and Variable, Abstract Classes, Interfaces, **Packages :** Importing Packages and Classes, User defined packages.

**UNIT – III: Exception Handling & Multithreading**

Exceptions, Types of Exceptions try, catch, finally, throw, throws keywords, creating your own exception  
**Multithreading:** Multithreading Concept, Thread Life Cycle, Creating multithreading Application, Thread Priorities, Thread synchronization.

**UNIT – IV: Abstract Window Toolkit & Applets**

**Abstract Window Toolkit:** Components and Graphics, Containers, Frames and Panels, Layout Managers- Border Layout, Flow Layout, Grid Layout, Card Layout, AWT all Components, Event Delegation Model, Event Source and Handlers, Event Categories, Listeners, **Applets-**Applet Life Cycle, Applet Context, Inter applet communication.

**Books:**

- 1) E. Balaguruswamy, “Programming with Java - A Primer”, The Sun Micro Systems Press, New Delhi, ISBN 81-265-0931-7
- 2) Peter Van der Linden, “Just Java”, The Sun Micro Systems Press, New Delhi, ISBN, 0130897930
- 3) RashmiKanta Das, “Core Java For Beginners”, Vikas Publishing House PVT LTD ISBN-978-93259-6850-9

**References:**

- 1) Cay S Horstmann Gary Cornell, “Core JAVA 2 Vol -1, 2”, The Sun Micro Systems Press, New Delhi, ISBN-13: 978-0470105559
- 2) Herbert Schildt, “Java Fundamentals: A Comprehensive Introduction”, Tata McGraw-Hill, ISBN-13: 978-1-25-900659-3

**B.Sc.–III**  
**SEMESTER–VI**  
**(Computer Science)**  
**Paper-11.2(Elective II)**  
**DATA COMMUNICATION WITH CLOUD COMPUTING**

[Max.Marks: 50]

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**UNIT I: Data Communication**

**Data Transmission-** Concept and Terminology, Analog and Digital Data Transmission, Transmission Impairment, Transmission Media. **Data Encoding :** Digital and Analog Data,

**Signals:** Digital and Analog Signal. Digital Data Communication- Asynchronous and Synchronous Transmission, Error Detection Technique, Interfacing. **Data Link Controls :** Line Configuration, Flow Control, Error Controls, Data Link Control Protocols. **Multiplexing :** Frequency Division Multiplexes, Synchronous Time Division Multiplexing.

**UNIT II: Data Communication Network**

**Communication Network :** Circuit Switching, Packet Switching - Packet Switching Principal, Virtual Circuit and Datagram, Message Switching, Single Node Network, Digital Network Concept. Routing, X.25. **LAN and MAN :** LAN, Types of LAN, MAN Technology. **Topologies:** Bus, Tress ,Star, Ring Medium Access Control Protocols, LAN/MAN Standards.

**UNIT III: Communication Architecture**

**Protocols and Architecture:** Protocol, The Layered Approach, OSI Model, TCP/IP Protocol Suite, System Network Architecture, WAN Architecture and Transmission Mechanism. **Internetworking:** Principles of Internetworking, The Bridge, Routing With Bridge, Connectionless Internetworking, Router-Level Protocol, Connection Oriented Internetworking.

**UNIT IV: Cloud Computing Basics**

**Cloud Computing :** Overview , History, Characteristics/Capabilities of Clouds, Cloud Components, First stake holders of Cloud market, Virtualization, Cloud Computing Architecture. Cloud Computing Services :SaaS, PaaS, IaaS, Cloud Computing Deployment Models – Public, Private, Hybrid and others. Cloud Benefits and Limitations, Security concerns & benefits. Cloud Environment Roles, cloud vs. Distributed Computing, Regulatory issues with cloud.

**Books:**

- 1) C.S.V Murthy, “ Data Communication and Networking”, Himalaya Publishing House, ISBN-81-7866-181-0
- 2) Forouzan, ”Data Communication and Network”, TMH, ISBN-0-07-049935-7
- 3) Toby Velte, Anthony Velte, “Cloud Computing A Practical Approach”, McGraw-hill, ISBN : 0071626948.

**References:**

- 1) Tim Mather, SubraKumarsamy, ” Cloud Security and Privacy”, ISBN:0596802765
- 2) RajkumarBuyya, “ Mastering cloud computing”, TMH
- 3) Willam Stalling “Data and Computer Communication”, PHI, ISBN-81-7808-442-2

**B.Sc.–III**  
**SEMESTER–VI**  
**(Computer Science)**  
**Paper-11.3(Elective III)**  
**PYTHON PROGRAMMING**

**[Max Marks:50]**

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**UNIT - I:** Features, basic syntax, Writing and executing simple program, Basic Data Types such as numbers, stringsetc Declaring variables, Performing assignments, arithmetic operations, Simple **Input-Output** :Printing on screen, reading data from keyboard.

**UNIT –II: Sequence Control** – Precedence of operators, Type conversion. **Conditional Statements:** if, if-else, nested if –else looping: for, while, nested loops, **Control statements:** Terminating loops, skipping specific conditions**String Manipulation:** declaring strings, string functions.**Manipulating Collections:** Lists, Tuples. Dictionaries – Concept of dictionary, techniques to create, update& delete dictionary items.

**UNIT –III: Functions:** Defining a function, calling a function, Advantages of functions, types of functions, function parameters, Formal parameters, Actual parameters, and anonymous functions, global and local variables. **Modules:** Importing module, Creating & exploring modules, Math module, Random module, Time module,

**UNIT –IV: Exception Handling:** Exception, Except clause, try and finally clause, user defined exception. **OOPs Concept:** Class and Object, attributes, Inheritance, Overloading, Overriding, Data hiding.

**Books:**

- 1) Charles Dierbach, Introduction to Computer Science using Python, Wiley, 2013
- 2) James Payne ,Beginning Python: Using Python 2.6 and Python 3, Wiley India, 2010

**References:**

1. Paul Gries , Jennifer Campbell, Jason Montojo, Practical Programming: An Introduction to Computer Science Using Python 3, Pragmatic Bookshelf, 2/E 2014
2. AdeshPandey, Programming Languages – Principles and Paradigms, Narosa, 2008

**B.Sc.–III SEMESTER–VI  
(Computer Science)  
Paper-11.4(Elective IV) SOFTWARE TESTING**

**[Max Marks:50]**

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**UNIT - I:**

**Introduction:** Testing as an Engineering Activity, Testing as a Process, testing axioms, Basic Definitions Software Testing Principles, The Tester's Role in a Software Development Organization, Origins of Defects, cost of defects, Defect Classes, The Defect Repository and Test Design , Defect Examples, Developer/Tester Support for Developing a Defect Repository, Defect Prevention Strategies.

**UNIT - II:**

**Test Case Design :** Test Case Design Strategies, Using Black Box Approach to Test Case Design, Random Testing, Requirements based testing, Boundary Value Analysis, Decision tables, Equivalence Class Partitioning, State-based testing, Cause-effect graphing, Error guessing, Compatibility testing, User documentation testing, Domain testing Using White Box Approach to Test design, Test Adequacy Criteria, static testing vs. structural testing, code functional testing, Coverage and Control Flow Graphs, Covering Code Logic, Paths, Their Role in White-box Based Test Design, code complexity testing, Evaluating Test Adequacy Criteria.

**UNIT - III:**

**Levels Of Testing :** The Need for Levels of Testing, Unit Test, Unit Test Planning, Designing the Unit Tests, The Test Harness, Running the Unit tests and Recording results, Integration tests, Designing Integration Tests, Integration Test Planning, Scenario testing, Defect bash elimination.

System Testing, Acceptance testing, Performance testing, Regression Testing, Internationalization testing, Ad-hoc testing - Alpha, Beta Tests, testing OO systems, Usability and Accessibility testing, Configuration testing, Compatibility testing, Testing the documentation, Website testing

**UNIT - IV:**

**Test Management :** People and organizational issues in testing, organization structures for testing teams, testing services, Test Planning, Test Plan Components, Test Plan Attachments, Locating Test Items – test management, test process, Reporting Test Results, The role of three groups in Test Planning and Policy Development, Introducing the test specialist, Skills needed by a test specialist, Building a Testing Group.

**Reference Books:**

1. SrinivasanDesikan andGopaldaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson education, 2006.
2. Ilene Burnstein, “Practical Software Testing”, Springer International Edition,Process”, Pearson Education, 1995
3. Boris Beizer, “Software Testing Techniques” – 2nd Edition, Van NostrandReinhold New York, 1990.

**B.Sc.–III SEMESTER–VI**  
**(Computer Science)**  
**Paper-12.1 (Elective I) –:Media Management**  
**[Max. Marks: 50]**

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**UNIT- I: PRINCIPLES OF MEDIA MANAGEMENT**

Principles of media management and their significance. Media as an industry and profession.

**UNIT- II: OWNERSHIP**

Ownership patterns of mass-media in India: sole proprietorship, partnership, private limited companies, Public limited companies, trusts, co-operatives, religious institutions (societies) and franchises (chains).

**UNIT –III: INDIAN MEDIA**

Foreign equity in Indian media (including print media) and Press Commissions on Indian newspaper. Management structure, Organizational structure. Functions of different departments: General Administration, Editorial, Finance.

**UNIT- IV: CIRCULATION AND MARKETING**

Circulation (sales promotion), Marketing (Advertising), Human Resource and Production. Economics of print and electronic media.

**BOOKS:**

1. Media Management: Leveraging Content for Profitable Growth Andrej Vizjak, Max Josef Ringlstetter Springer Science & Business Media, 10-Dec-2002 Scott Basham, "Pagemaker in Easy Steps", Dream Tech, ISBN: 978-81-7722-0001
2. Kogent Learning Solution, "Corel Draw in Easy Steps", Dream Tech ISBN: 978-81-7722-960-8
3. "Photoshop in Easy Steps", Kogent Learning Solution, Dream Tech ISBN: 978-93-5004-078-2

**B.Sc.–III SEMESTER–VI  
(Computer Science)  
Paper-12.2 (Elective II) –:A Certification Course from MOOC**

**[Max. Marks: 50]**

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**Enroll and Select any one course from Certification Course from MOOC**

**B.Sc.–III SEMESTER–VI  
(Computer Science)  
Paper-12.3 (Elective III) –:E- Waste Management**

**[Max. Marks: 50**

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**UNIT – I SOURCES, COMPOSITION AND CHARACTERISTIC**

Sources, Composition and characteristic of hazardous waste, Hazardous Waste (Management and Handling) Rules, 1989 and amendments, Federal Hazardous Waste Regulations under RCRA, Superfund, CERCLA and SARA. Toxicology, public health impact, Protocols, issues and challenges in transportation of hazardous waste.

**UNIT – II CHARACTERIZATION OF MEDICAL WASTE**

Characterization of medical waste- Bio-medical wastes (Management and Handling) Rules, 1998, Amendments and guidelines, segregation, packaging, storage, transport of infectious waste. Techniques of Bio-medical waste management. Health and safety rules. Protocols, issues and challenges in transportation of Biomedical waste.

**UNIT – III TREATMENT METHOD**

Treatment method- Autoclave, Hydroclave, Microwave, Chemical Disinfection, Solidification and stabilization, Bioremediation, Thermal Conversion Technologies, accumulation and storage of hazardous waste, land disposal of hazardous waste, other treatment and disposal method. Common Hazardous Waste Treatment facilities (TSDF).

**UNIT – IV E-WASTE**

E-waste: Introduction, toxicity due to hazardous substances in e-waste and their impacts, domestic e-waste disposal, e-waste management, technologies for recovery of resource from electronic waste, guidelines for environmentally sound management of e-waste, occupational and environmental health perspectives of recycling e-waste in India.

**Books:**

1. Tchobanoglous G., Theisen H., Viquel S.A., “Integrated Solid Waste Management: Engineering, Principles and Management issues”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
2. CPHEEO Manual on Municipal Solid Waste Management.

**Reference Books:**

1. Peavy H.S., Rowe D.R., Tchobanoglous G., “Environmental Engineering”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
2. Cunningham W.P., Cunningham M.A., “Principles of Environmental Science”, Tata McGraw Hill Publishing Company Ltd., New Delhi.
3. Johri R., “E-waste: implications, regulations, and management in India and current global best practices”, TERI Press, New Delhi.
4. [R4] Krishnamoorthy B., “Environmental Management, Text Book and Cases”, PHI Learning (P) Ltd., New Delhi.

**B.Sc.–III SEMESTER–VI  
(Computer Science)  
Paper-12.4 (Elective IV) –: PC-Maintenance**

**[Max. Marks: 50**

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**Unit I: Preventive Maintenance**

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

**Unit II: CPU and Monitor**

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

**Unit III: Study of Drives**

Study of Different Types of Drives, Hard Drive Interfaces- IDE, SCSI, SATA Hard Drive Performance, Installing Hard Drives, Partitioning, Disk Formatting, Common Hard Drive Problems. Installation of Operating System and Software: Installing Video Card, Installing The CD Rom Drive , Installing Key Board and Mouse, Installing Sound Card, Installing Modem, Installing the Motherboard , Installing the Power Supply.

**Unit IV: Study of Printer, Formatting and Trouble Shooting**

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

**Trouble Shooting:** Diagnostic and Repair Tools - Diagnostic Software Tools- Diagnostic Hardware Tools, Assembling and Disassembling PC. Troubleshooting Display Problems, Memory Troubleshooting, Power Supply Testing and Problems Troubleshooting. Cleaning and Trouble Shooting of Keyboards, Mouse, Front Panel Indicators and Speakers Troubleshooting.

**Books:**

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

**B.Sc.–III(Computer Science)**  
**SEMESTER-VI**  
**Practical based on: Core JAVA**

1. Write a program using **else if ladder** for grading the students in an academic institute. The grading is done according to the following rules.

AVERAGE MARKS	GRADE
80 to 100	Honors
60 to 79	First division
50 to 59	Second Division
40 to 49	Third Division
0 to 39	Fail

2. Write an algorithm, draw a flow chart and write a program to find the **area** of the following using **switch case**.
- Addition
  - Subtraction
  - Multiplication
  - Division
  - Power
3. Write an algorithm, draw a flow chart and write a program to generate the following output:

a. 1	b. 5 4 3 2 1
1 2	5 4 3 2
1 2 3	5 4 3
1 2 3 4	5 4
1 2 3 4 5	5

- Write an algorithm, draw a flow chart and write a program to search a number in an array.
- Write an algorithm, draw a flow chart and write a program to for Constructor Overloading
- Write an algorithm, draw a flow chart and write a program to illustrate Call By Value and Call By Reference.
- Write an algorithm, draw a flow chart and write a program using concept of package.
- Write an algorithm, draw a flow chart and write a program to use different methods of string class ( Equal(), indexOf(), compareTo(), concat(), replace(), trim())
- Write an algorithm, draw a flow chart and write a program to display Multiple Inheritance means interface.
- Write an algorithm, draw a flow chart and write a program to display simple Applet.
- Write an algorithm, draw a flow chart and write a program to demonstrate Border Layout.
- Write an algorithm, draw a flow chart and write a program for illustrate the concept of Threading
- Write an algorithm, draw a flow chart and write a program to use different methods of Thread class.
- Write an algorithm, draw a flow chart and write a program for Exception Handling.
- Write an algorithm, draw a flow chart and write a program for Throwing our own Exceptions.
- Write an algorithm, draw a flow chart and write a program for using frame object displaying:- menu as “FILE” with menu items “NEW”,”OPEN”,”CLOSE”,“EXIT” & “EDIT” with menu Items. “CUT”, “COPY”, “PASTE”.
- Write an algorithm, draw a flow chart and write a program for Demonstrating Panel and Text Area Using null Layout.

18. Write an algorithm, draw a flow chart and write a program for List Component for single and multiple options using Grid Layout.
19. Write an algorithm, draw a flow chart and write a program for Checkbox group using Flow Layout and display its state.