Faculty of Computer Application & IT and Science

Study and Evaluation Scheme

Of

Bachelor of Science (Honours)

In Information Technology (CBCS)

B.Sc.(H) (IT) (CBCS)

(Applicable w.e.f Academic Session 2016-19, till revised)

AKS UNIVERSITY, SATNA

Study and Evaluation Scheme

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AKS University, Satna (MP)
B.Sc.(IT)(H)(CBCS) Scheme
Session 2016 Onwards
Semester 1.

S.NO.	PAPER CODE	SUBJECT NAME	#L	#T	#P	# CREDITS
1	96CA101	Programming Fundamentals using C	4	0	0	4
2	96CA102	Computer System Architecture	4	0	0	4
3	96EV103	Environmental Science	2	0	0	2
4	96CA104	Computer Fundamentals	4	0	0	4
5	96MS105	Mathematics-I(Algebra)	5	1	0	6
1	96CA151	Programming Fundamentals using C (LAB)	0	0	4	2
2	96CA152	Computer System Architecture (LAB)	0	0	4	2
3	96CA153	Computer Fundamentals (LAB)	0	0	4	2
		TOTAL CREDITS	19	01	12	26

B.Sc.(IT)(H)(CBCS) Scheme
Semester 2

S.NO.	PAPER CODE	SUBJECT NAME	#L	#T	#P	# CREDITS
1	96CA201	Programming in C++	4	0	0	4
2	96CA202	Discrete structures	5	1	0	6
3	96SD203	English Communication	2	0	0	2
4	96CA204	Applied Electronics	4	0	0	4
5	96CA205	Information Security and Cyber Laws	5	1	0	6
1	96CA251	Programming in C++ (LAB)	0	0	4	2
2	96CA252	Applied Electronics (LAB)	0	0	4	2
		TOTAL CREDITS	20	02	08	26

B.Sc.(IT)(H)(CBCS) Scheme
Semester 3

S.NO.	PAPER CODE	SUBJECT NAME	#L	#T	#P	# CREDITS
1	96CA301	Data Structures	4	0	0	4
2	96CA301	Operating system	5	1	0	6
3	96CA303	Computer Networks	4	0	0	4
4	96CA305	Programming in JAVA	3	0	0	3
5	96CA304	Numerical Methods	3	0	0	3
1	96CA351	Data Structures (LAB)			3	2
2	96CA352	Computer Networks (LAB)			3	2
3	96MS353	Numerical Methods (LAB)			2	1
4	96CA354	Programming in JAVA (LAB)			2	1
		TOTAL CREDITS	21	01	10	26

B.Sc.(IT)(H)(CBCS) Scheme
Semester 4

S.NO.	PAPER CODE	SUBJECT NAME	#L	#T	#P	# CREDITS
1	96CA401	Design and Analysis of Algorithm	4	0	0	4
2	96CA402	Software Engineering	4	0	0	4
3	96CA403	Database Management System	4	0	0	4
4		**Elective 1:**	5	1	0	6
1	96CA451	Minor Project-1	0	0	4	2
2	96CA452	Design and Analysis of Algorithm (LAB)	0	0	3	2
3	96CA453	Software Engineering (LAB)	0	0	3	2
4	96CA454	Database Management System (LAB)	0	0	3	2
		TOTAL CREDITS	17	01	13	26

Elective 1:(Choose any one of these)

a. Artificial Intelligence **96CA404-A**
b. Operational Research **96MT404-B**
c. Calculus **96MS404-C**
d. Introduction to Data Science **96CA404-D**
e. Data Mining **96CA404-E**

B.Sc.(IT)(H)(CBCS) Scheme
Semester 5

S.NO.	PAPER CODE	SUBJECT NAME	#L	#T	#P	# CREDITS
1	96CA501	Internet Technologies	4	0	0	4
2	96CA502	Theory of Computation	5	1	0	6
3		**Elective 2:**	4	0	0	4
4		**Elective 3:**	5	1	0	6
5	96CA551	Minor Project-2	0	0	4	2
	96CA552	Internet Technologies (LAB)	0	0	3	2
	96CA553-A/B/C/D/E	**Elective 2:(LAB)**	0	0	3	2
		TOTAL CREDITS	18	02	10	26

Elective 2: (Choose any one of these)

a. Programming with Python **96CA503-A**
b. System Programming **96CA503-B**
c. Network Programming **96CA503-C**
d. UNIX/LINUX Programming **96CA503-D**
e. Android Programming **96CA503-E**

Elective 3: (Choose any one of these)

a. Statistics **96MS504-A**
b. Compiler Design **96CA504-B**
c. Digital Image Processing **96CA504-C**
d. Cloud Computing **96CA504-D**
e. Microprocessor **96CA504-E**

B.Sc.(IT)(H)(CBCS) Scheme
Semester 6

S.NO.	PAPER CODE	SUBJECT NAME	#L	#T	#P	# CREDITS
1	96CA651	Major Project	0	0	24	12
2	96CA652	Seminar and Presentation	0	0	04	02
		TOTAL CREDITS	00	00	28	14

B.Sc.(IT)(H)(CBCS)
Semester-I

Subject Name: Programming Fundamentals using C Total Lectures=60

Unit-1

Introduction to C : History of C , Overview of Procedural Programming Using main() function, Compiling and Executing Simple Programs in C.

Data Types, Variables, Constants, Operators and Basic I/O: Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putchar etc), Formatted and Console I/O (printf(), scanf(), Using Basic Header Files (stdio.h, conio.h etc).

Unit-2

Expressions, Conditional Statements and Iterative Statements: Simple Expressions in C (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

Functions: Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments.

Unit-3

Array: Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays from functions, Structure with union as members, Union with structures as members.

Unit-4

Pointers and References in C: Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions.

Derived Data Types (Structures and Unions):Understanding utility of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures

Unit-5

File I/O, Preprocessor Directives:Opening and closing a file (use of fstream header file, ifstream, ofstream and fstream classes), Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files, Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros

Text Books:
1. The Complete Reference 'C' Tara MC Graw Hill Fourth Edition Herbert Schildt
Reference Books:
1. Programming Language in 'C' Gotfried Tata MC Graw Hill.
2. Let Us C, Yashwant Kanitkar

Programming Fundamentals using C Lab **Practical: 60**

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series S = 1+1/2+1/3+1/4+……
4. WAP to compute the sum of the first n terms of the following series S =1-2+3-4+5…….
5. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
7.WAP to compute the factors of a given number.
8. Write a macro that swaps two numbers. WAP to use it.
9. WAP to print a triangle of stars as follows (take number of lines from user):

```
*
***
*****
*******
*********
```

10. WAP to perform following actions on an array entered by the user:
i) Print the even-valued elements
ii) Print the odd-valued elements
iii) Calculate and print the sum and average of the elements of array
iv) Print the maximum and minimum element of array
v) Remove the duplicates from the array
vi) Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.
11. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
12. Write a program that swaps two numbers using pointers.
13. Write a program in which a function is passed address of two variables and then alter its contents.
14. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
15. Write a program to find sum of n elements entered by the user. To write this program,allocate memory dynamically using malloc() / calloc() functions or new operator.
16. Write a menu driven program to perform following operations on strings:
a) Show address of each character in string
b) Concatenate two strings without using strcat function.
c) Concatenate two strings using strcat function.
d) Compare two strings

e) Calculate length of the string (use pointers)
f) Convert all lowercase characters to uppercase
g) Convert all uppercase characters to lowercase
h) Calculate number of vowels
i) Reverse the string

17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
18. WAP to display Fibonacci series (i)using recursion, (ii) using iteration
19. WAP to calculate Factorial of a number (i)using recursion, (ii) using iteration
20. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
21. WAP for call by value.
22. WAP for call by reference.

B.Sc.(IT)(H)(CBCS)
Semester-I

Subject Name: Computer System Architecture **Total Lecture= 60**

Unit 1

Data Representation and Basic Computer Arithmetic: Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison, multiplication and division algorithms for integers

Unit 2

Gates and Circuits: Logic gates, boolean algebra, k-map (2,3,4 variable), circuit simplification, sequential circuits, flip-flops and combinational circuits decoders, multiplexers, registers, counters and memory units.

Unit 3

Basic Computer Organization and Design: Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt, Interconnection Structures, Bus Interconnection design of basic computer.

Unit 4

Central Processing Unit: Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control. Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming, RISC, CISC architectures, pipelining and parallel architecture.

Unit 5

Memory Organization: Memory hierarchy, Cache memory, Associative memory, mapping.

Input-Output Organization: Input / Output: External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels.

Recommended Books:

1. M. Mano, Computer System Architecture, Pearson Education 1992
2. W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition 2009, Prentice Hall of India
3. Digital Design, M.M. Mano, Pearson Education Asia

List of practical:

1. Study of AND ,OR NOT Gates.
2. Study of NAND ,NOR ,XNOR Gates
3. To verify the truth table of XOR and XNOR Gates
4. To Verify operation of AND andNor gates as Universal Gates.
5. To study Half Adder Circuit.
6. Configuring Hardware Profile.
7. Installation of Network Interface Card (NIC).
8. Draw layout & understand sections of Motherboards & Add on Cards.
9. Configuring important parameters of CMOS Setup utility, BIOS update.
10. Identify different types of Drives (FDD, HDD, CDO, Zip, Pen, SCSI Drive).
11. Installation of SCSI Drive, Optical Drives (CDR, DVRW).
12. Installation of OS Single, Partitioning, Formatting.

B.Sc.(IT)(H)(CBCS)
Semester-I

Subject Name: Environmental Science **Total Lecture=30**

Unit I

Definition, scope and importance, need for public awareness. Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, mining, dams and their effects on forest. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Land resources : Land as a resource, land degradation, soil erosion and desertification.

Unit II

Food resources: World food problems, effects of modern agriculture, fertilizer-pesticide problems, Mineralresources: Use and exploitation, environmental effects of extracting and using mineral resources, Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit III

Concept of an ecosystem, Structure and function of an ecosystem.Energy flow in the ecosystem.Ecological succession.Food chains, food webs and ecological pyramids.introduction, types, characteristic features, structure and function of the terrestrial ecosystem and Aquatic ecosystems.

Diversity, Definition & types, Biogeographical classification of India, Value of biodiversity, Biodiversity at global, National and local levels.Inida as a mega-diversity nation, Hot-sports of biodiversity, Threats to biodiversity, Endangered and endemic species of India, Conservation of biodiversity.

Unit IV

Definition: Cause, effects and control measures of :- Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards, Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies, Disaster management: floods, earthquake, cyclone and landslides.

Unit V

Sustainable development, urban problems related to energy Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns, Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Environmental legislation, Public awareness.Population growth, Population explosion - Family Welfare Programme.Environment and human health. HIV/AIDS..Role of Information Technology in Environment and human health.

Suggested Books:

1. A text book of Environmental Studies, ErachBharucha, UGC Publication Delhi
2. A text book of Environmental science: PurohitShami&Agrawal, Agrobios Student edition Jaipur
3. A text book of Environmental Studies: Kaushi&Kaushik New age International Publication
4. ParyavaranAddhyan : MP Hindi Granth Academy

5. ParyavaranAddhyan : KL Tiwari and Jadhav
6. ParyavaranAddhyan/Shiksha by: DrMahendra Kumar Tiwari University Publication Delhi
7. Introduction to Environmental Science by Y. Anjaneyulu BS Publication Hyderabad

B.Sc.(IT)(H)(CBCS)
Semester-I

Subject Name: Computer Fundamentals **Total Lecture=60**

Unit 1

Introduction: Introduction to computer system, uses, types

Human Computer Interface: Types of software, Operating system as userinterface, utility programs

Unit 2

Devices: Input and output devices (with connections and practical demo),keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter

Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory,hard disks, optical disks

Unit 3

Internal Computer Organization and Architecture: C.P.U., registers, system bus, mainmemory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

Unit 4

Networking and communication Technologies: LAN, MAN, WAN,Internet, WWW, Bluetooth, cloud computing, big data, datamining, mobile computing and embedded systems

Unit 5

Office Automation: MS Word, MS Powerpoint, MS Excel

Reference Books:

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.
2. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
3. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

Computer Fundamentals Lab **Practical: 60**

Practical exercises based on MS Office/ Open Office tools using document preparation and spreadsheet handling packages.

MS Word

1. Prepare **a grocery list** having four columns (Serial number, The name of the product, quantity and price) for the month of April, 06.
   - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
   - The headings of the columns should be in 12-point and bold.
   - The rest of the document should be in 10-point Times New Roman.
   - Leave a gap of 12-points after the title.

2. Create a **telephone directory**.
   - The heading should be 16-point Arial Font in bold
   - The rest of the document should use 10-point font size
   - Other headings should use 10-point Courier New Font.
   - The footer should show the page number as well as the date last updated.

3. Design a **time-table form** for your college.
   - The first line should mention the name of the college in 16-point Arial Font and should be bold.
   - The second line should give the course name/teacher's name and the department in 14-point Arial.
   - Leave a gap of 12-points.
   - The rest of the document should use 10-point Times New Roman font.
   - The footer should contain your specifications as the designer and date of creation.

4. BPB Publications plans to release a new book designed as per your syllabus. Design the **firstpage of the book** as per the given specifications.
   - The title of the book should appear in bold using 20-point Arial font.
   - The name of the author and his qualifications should be in the center of the page in 16-point Arial font.
   - At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
   - The details of the offices of the publisher (only location) should appear in the footer.

5. Create the following one page documents.
   a. Compose a note inviting friends to a get-together at your house, Including a list of things to bring with them.
   b. Design a certificate in landscape orientation with a border around the document.
   c. Design a Garage Sale sign.
   d. Make a sign outlining your rules for your bedroom at home, using a numbered list.

6. Create the following documents:
   (a) A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.

(b) Use a newsletter format to promote upcoming projects or events in your classroom or college.

7. Convert following text to a table, using comma as delimiter

Type the following as shown (do not bold).

Color, Style, Item
Blue, A980, Van
Red, X023, Car
Green, YL724, Truck
Name, Age, Sex
Bob, 23, M
Linda, 46, F
Tom, 29, M

9. Enter the following data into a table given on the next page.

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order:

In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

10. Wrapping of text around the image.

11. Following features of menu option must be covered

FILE	Complete menu
EDIT	Complete menu
VIEW	Complete menu
INSERT	Complete menu
FORMAT	Complete menu

TABLE	Complete menu
WINDOW	Complete menu
HELP	Complete menu
TOOLS	All options except Online collaboration, Tools on Macro, Templates

MS Excel

1. Enter the Following data in Excel Sheet

REGIONAL SALES PROJECTION

State	**Qtr1**	**Qtr2**	**Qtr3**	**QTR4**	**Qtr Total**	**Rate**	**Amount**
Delhi	2020	2400	2100	3000	15		
Punjab	1100	1300	1500	1400	20		
U.P.	3000	3200	2600	2800	17		
Harayana	1800	2000	2200	2700	15		
Rajasthan	2100	2000	1800	2200	20		

TOTAL

AVERAGE

(a) Apply Formatting as follow:

I.Title in TIMES NEW ROMAN

ii. Font Size - 14

iii. Remaining text - ARIAL, Font Size -10

iv. State names and Qtr. Heading Bold, Italic with Gray Fill Color.

v. Numbers in two decimal places.

vi. Qtr. Heading in center Alignment.

vii. Apply Border to whole data.

(b) Calculate State and Qtr. Total

(c) Calculate Average for each quarter

(d) Calculate Amount = Rate * Total.

2. Given the following worksheet

	A	**B**	**C**	**D**
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	HarBhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>= 80	A+
>= 60 < 80	A
>= 50 < 60	B
< 50	F

3. Given the following worksheet

	A	**B**	**C**	**D**	**E**	**F**	**G**
1	**Salesman**			**Sales in (Rs.)**			

2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission
3	S001	5000	8500	12000	9000		
4	S002	7000	4000	7500	11000		
5	S003	4000	9000	6500	8200		
6	S004	5500	6900	4500	10500		
7	S005	7400	8500	9200	8300		
8	S006	5300	7600	9800	6100		

Calculate the commission earned by the salesmen on the basis of following Candidates:

If total Sales	**Commission**
< 20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
>= 35000	11% of sales

The total sales is sum of sales of all the four quarters.

4. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

Allowances

- HRA Dependent on Basic
  30% of Basic if Basic <=1000
  25% of Basic if Basic>1000 & Basic<=3000
  20% of Basic if Basic >3000
- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance Rs. 50/- if Basic is <=1000Rs.
  75/- if Basic >1000 & Basic<=2000
  Rs. 100 if Basic >2000
- Entertainment Allowance NIL if Basic is <=1000Rs.
  100/- if Basic > 1000

Deductions

- Provident Fund 6% of Basic
- Group Insurance Premium Rs. 40/- if Basic is <=1500
  Rs. 60/- if Basic > 1500 & Basic<=3000
  Rs. 80/- if Basic >3000

Calculate the following:

Gross Salary = Basic + HRA + DA + Conveyance + Entertainment
Total deduction = Provident Fund + Group Insurance Premium
Net Salary = Gross Salary – Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the format below:

No. of Instalments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX

6	XX	XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest and time

Rate of Interest	8%
Time	5 Years
Principal	Simple Interest
1000	?
18000	?
5200	?

7. The following table gives year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

(*a*) Calculate total sale year wise.

(*b*) Calculate the net sale made by each salesman

(*c*) Calculate the maximum sale made by the salesman

(d) Calculate the commission for each salesman under the condition.

(*i*) If total sales >4,00,000 give 5% commission on total sale made by the salesman.

(*ii*) Otherwise give 2% commission.

(*e*) Draw a bar graph representing the sale made by each salesman.

(*f*) Draw a pie graph representing the sale made by salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net): 1,475

EXPENSES	**JAN**	**FEB**	**MARCH**	**QUARTER TOTAL**	**QUARTER AVERAGE**
Rent600.00	600.00	600.00			
Telephone	48.25	43.50	60.00		
Utilities	67.27	110.00	70.00		
Credit Card	200.00	110.00	70.00		
Oil	100.00	150.00	90.00		
AV to Insurance	150.00				
Cable TV	40.75	40.75	40.75		
Monthly Total					

(a) Calculate Quarter total and Quarter average.

(b) Calculate Monthly total.

(c) Surplus = Monthly income - Monthly total.

(d) What would be total surplus if monthly income is 1500.

(e) How much does telephone expense for March differ from quarter average.

(f) Create a 3D column graph for telephone and utilities.

(g) Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher name	**1997**	**1998**	**1999**	**2000**	**total**
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	
E Rs	800.00	Rs. 1,000.00	Rs. 3,000.00	Rs. 560.00	

(a) Compute the total revenue earned.

(b) Plot the line chart to compare the revenue of all publisher for 4 years.

(b) Chart Title should be _Total Revenue of sam's Bookstall (1997-2000)'

(c) Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range 50-60

B.Sc.(IT)(H)(CBCS)

Semester-I

Subject Name: Mathematics-I (Algebra) **Total Lecture=60**

Unit-1

Determinants:

Introduction of Determinant, Minor Cofactors and properties of Determinant, Factor Theorem, special types of Determinants, Application of Determinants, Solution of Simultaneous Linear Equation by Determinants(Cramer's Rule).

Unit-2

Algebra of Matrices:

Definition, various types of matrices, Addition, Subtraction, Multiplication of matrices, Properties of matrix multiplication, Adjoint of Square matrix, Inverse of matrix, Rank of matrix, Normal form (Canonical form).

Unit-3

Consistency of linear system of equation and their solutions:

Solution of Simultaneous Equation, Types of Linear Equation, Homogeneous Equations, Cramer's Rule, Linear Dependence and Independence of Vectors, Eigen values, Eigen Vector, Cayley-Hamilton Theorem, and Orthogonal Vectors.

Unit-4

Complex Number:

Introduction of Complex Numbers, Geometrical Representation of Imaginary Numbers, Argand Diagram, Equal Complex Number, Addition, Subtraction, Power of i, Multiplication, Conjugate of a complex Number, Division, Types of Complex Number, Square Roots of a Complex Number.

Unit-5

Vector Algebra:

Vectors, Additions of Vectors, Unit Vector, Position Vector of a Point, Ratio Formula, Product of two Vectors, Scalar, or Dot Product, Vector Product or Cross product, Scalar Triple Product, Vector product of three Vector, Area of Parallelogram.

Text Books

1. H.K. Dass, Higher Engineering Mathematics, S .Chand Publishing & Company India Ltd.New Delhi (2012).

References Book:

1. DeFranza, Gagliardi. Introduction To Linear Algebra With Applications, New Age International (P) Ltd. New Delhi (2012).
2. A.K. Sharma, Linear Algebra, Discovery Publishing House, 2007

B.Sc.(IT)(H)(CBCS)

Semester-II

SUBJECT NAME: PROGRAMMING IN C++

Unit – 1

OOPS-Evolution of programming methodologies, origin of c++,procedural Approach Vs. Object oriented approach, Principles or concepts of OOPs. Merits and demerits of OOPs.Comparison of C and C++-Limitations of c, Introduction to C++, Structure of C++ Program. Added features of C++ over C-Storage classes, reference variables, inline functions, cin, cout. Scope resolution operator, member derefencing operator. Default arguments.

Unit – 2

Introduction to Objects and classes-Defining the class, defining data members and member functions, creating objects, access specifiers-private, public, protected. Nested classes, local classes, empty class. Friend function and friend class.Passing objects as function arguments, returning objects from functions, static members, this pointer, comparison of class with structure. Memory management-new and delete operator, pointer to object, pointer to class members, wild pointers, dangling pointers, smart pointers.

Unit – 3

Constructors and destructors-Purpose of constructors and destructors,default constructors, constructors with and without parameters, Constructor overloading, copy constructor, deep and shallow copy. Invoking constructor and destructor, dynamic constructors, constructors and destructors with static members.

Overloading Concepts-Function Overloading, Unary and binary operator overloading, overloading new and delete operators, overloading special operators.

Unit – 4

Inheritance-Basic concepts ,Reusability and Extensibility, Types of Inheritance, private ,public and protected Inheritance. Virtual base class.Virtual destructor. Overriding member functions, order of execution of constructors and destructors. Polymorphism-Method polymorphism, polymorphism by parameter, parametric polymorphism, early and late binding.

Exceptions-Exceptions,Inheritance and Exceptions,ExceptionHierarchies,Inside an Exception Handler, defining your own exceptions

Unit – 5

Templates-Generic functions, Generic classes, Template restrictions.Streams and manipulators. Unformatted I/O functions. Creating insertors and Extractors.Files-Opening, reading, writing, appending and closing files.

Text books:

1. ObjectOrientedProgrammingusingC++,E.Balaguruswamy

Reference books:

1.ObjectOrientedProgramminginC++,RobertLafore

2.UMLin21Days,TechMedia

List of Practical's:

1. Write a C++ program that will ask for a temperature in Fahrenheit and display it in Celsius using a class called temp and member functions.
2. Create a class Distance, which accepts data in feet and inches, adds two distances and displays the members of the distance object in the appropriate form. Test the class in the main program by creating object d1 and d2 of type distance, accept data for each object and add them then display them.
3. An election is contested by five candidates. The candidates are numbered 1 to 5 and the voting is done by marking the candidate number on the ballot papers. Write a program to read the ballots and count the votes cast for each candidate using an array variable count. In case, a number read is outside the range 1 to 5, that ballot should be considered as a 'spoilt ballot', and the program should also count the number of spoilt ballots.
4. A Cricket team has the table of batting figures for a series of test matches. Write a program to read the data name, runs, innings, times not out into a class object and calculate the batting average, also display the result in the format as given below:

Player's name	Runs	Innings	Times Not Out	Batting Avg
Tendulkar	632	15	0	
Azharuddin	524	16	2	

5. Write a program to implement the push and pop functions of a stack using a class Stack. Also make use of a private member function display() to display contents of the stack after every push and pop operations. Create a member function init() to initialize top of the stack.
6. Define a class to represent Bank account. Include the following members. Data members
(1) Name of depositor
(2) Account number
(3) Type of account
(4) Balance member functions
(a) To assign initial values
(b) To deposit an amount in a particular account
(c) To withdraw an amount after checking the balance
(d) To display name and balance
Write a main program to test the class for handling 10 customers
7. Write a program that calculates the value of m raised to the power n for both int and double data types. (Use the concept of function overloading)
8. Write a function, which will take two objects of Distance Class as arguments and returns the largest one. Include a main () program to implement this function of the distance class.
9. Write a class to represent a vector (a series of float values). Include member functions to perform the following tasks:
(a) To create the vector
(b) To modify the value of a given element
(c) To multiply by a scalar value
(d) To add a vector to another
(e) To display the vector in the form (10, 20, 30)
10. Demonstrate the use of static variables and static function in a class by using it to count the number of objects created in the program,having a static function to display the count.
11. Imagine a check-post at a bridge. Car passing by the check-post are expected to pay Rs. 50 as tax. Most of the cars pay but sometimes a car goes without paying the tax. The check-post has to keep track of number of cars and amount collected. Create a class check to implement this problem. The data members of the class are no,to count number of class and amount to keep track of the amount collected. Write member function paying for cars which are paying the tax and another function nopay for cars not paying the tax, also write a function to display number of cars passed and amount collected.

12. Create a class date which stores date in dd-mm-yyyy format. Include appropriate constructors to initialize the objects. Write a member function which gives the differences of given two dates as number of days. Another function to which days can be added so as to given the date after addition of days. Check the class by creating objects of the date class.
Checking program should be menu driven.
13. Create a class that contains variables for storing feet and its equivalent value of inches. Pass to the class's constructor no. of feet and have the constructor display the no. of inches.
14. Create a function sleep() that pauses the computer for the number of seconds specified by its single argument. Overload sleep() so it can be called with either an integer or a string representation of an integer. (e.g. sleep(10) & sleep("10") both should be valid)
15. Write a class to represent a Matrix. Include member functions to perform the following tasks:
Matrix
Data Members
Integer array of 10X10 elements.
Integer row, column //dimensions.
Member Functions
To create the Matrix.
To add a Matrix to another.
To subtract a Matrix by another.
To multiply a Matrix to another.
To multiply a Matrix by a scalar.
To divide a Matrix by a scalar.
To transpose a Matrix.
To modify the value of a given element.
To display the Matrix
16. Create a class Matrix with the following data members :
int **p and int d1,d2; include a paramerized constructor that takes two arguments and allocates the memory for a two dimension matrix with d1 and d2 dimensions.
Also include a destructor. Overload +, - , * on objects of Matrix.
Also overload << and >> on objects of Matrix.
17. Given the following class specifications and using friend as a bridge, write a function to calculate the volume, assign it to member vol in class volume and display the value of vol.
class cylinder { intr,h;};
class volume { long vol;};
18. Following are the class specifications:
class A { int a;};
class B { int b;};
Using a friend function, calculate the max of two objects and display it.
19. Write a class to represent a vector (a linear array). Include member functions.
- default constructor to create vector dynamically of the size 1 and initialize its element to zero.
- parameterized constructor
- Overload the + operator to add two vectors
- Overload the * operator to multiply by a scaler value (scalar * vector or vector * scalar)
- Overload the >> operator to input a vector and the << operator to display the vector in the form (10,20....).
20. Write a menu driven program that can perform the following functions on strings. (Use overloaded operators where possible).
1. Compare two strings for equality (== operator)
2. Check whether first string is smaller than the second (<= operator)
3. Copy the string to another.
4. Extract a character from the string (overload [])
5. Reverse the string.
6. Concatenate two strings (+ operator)

21. Define two class Polar and Rectangle to represent points in the Polar and Rectangle systems. Use conversion routines to convert from one system to another.

22. Construct a class Distance having member variables float feets and float inches. Write a program to convert this class into the basic data type float, which will represent the total no. of inches of the class. Also include the code to accept the value of inches in a float variable and convert this basic data type into class Distance type having feets and inches as member variables.

23. Assume that the bank maintains two kinds of accounts for customers, one called savings account and another called current account.he saving account provides interest and withdrawal facilities but no cheque book facility while current account provides no interest. Facilities but provides with cheque book, also the current a/c holder should maintain a minimum amount in a a/c else he has to pay service charges. Using inheritance concept create a base class account that stores account holder name, account no, and type of account, from this base class derive two classes sav_acc and cur_acc.

These classes should include members

1) to accept deposit and update the balance
2) display balance
3) withdraw amount and update the balance
4) compute interest
5) check minimum balance and impose penalty.

24. Create two classes Grade and Student. The class Grade has data members Grade while student has data members such as roll no, name, and total marks of the student. Making use of data of both the Classes print the roll no, name, and grade of each student whose grade is set by the grade class.

25. Write a program that creates a base class called num. Have this class hold an integer value and contain a virtual function called shownum().

Create two derived classes called outhex and outoct that inherit num. Have the derived classes override shownum() so that it displays the value in hexadecimal and octal respectively.

26. Make the use of the write function to display your name in the following fashion.

n
na
nam
name
nam
na
n

27. Write a program to read a list containing item name, item code, and cost interactively and produce a three column output as shown below:

NAME	CODE	COST
C++	101	233.81
JAVA 2	32	456.34
HTML	31	99.00

28. Create a class phonebook having two data members to hold the name and phone number of that person. Define appropriate constructors and member functions to maintain a phonebook. Write a program to create this phonebook in a binary file and read it back from the same file. Also include the facility to update a phone number, given a name. Search that name into the file and update the phone number.

29. Write a program that reads a file and creates another file which is identical to the first one except that the consecutive spaces are replaced by one space. Use command line arguments to supply the input and output filenames at runtime.

30. Create a generic class Stack. Create push and pop member functions to perform push and pop operations.

B.Sc.(IT)(H)(CBCS)

Semester-II

SUBJECT NAME: DISCRETE STRUCTURES

UNIT-I:

Set Theory: Element of set, Types of set, Sets, Subsets, Equal Sets, Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complement of Sets, Cartesian Product, Venn Diagram, Associative Laws, Distributive Laws, De-Morgan's Laws, Duality Partitioning of a Set.

Unit-II

Relation and Function : Types and Composition of relation, Partial Order Relation, Equivalence Relation, Domain and Range, Onto, Into and One-One Function, Composite and Inverse Function, Introduction of Trigonometric, Logarithmic and Exponential Function.

Unit-III

Preposition: Preposition, First Order Logic, Basic Logic Operation, Logical Equivalence, Truth Table, Normal Forms, Predicates and Quantifiers, POSET, Boolean algebra and Logic Gates.

Unit-IV

Dimensional Geometry: Graph Theory, Concepts Graph, Sub graph, Bi-partite graph, Isomorphic Graph, Homeomorphic Graphs, Weighted Graphs, Shortest Paths in weighed graphs(*Dijkstra's algorithm)*, Operations on Graphs, Directed Graph, Matrix Representation On Graphs, Cyclic Graphs, Tree, Rooted Tree, Labeled Graph, Weighted Graph, Decision trees or Sorting Tree, Spanning Tree, Binary Trees, Algorithms- Prim's, Kruskal.

Unit-V

Algebraic Structures: Properties, Semi group, Monide, Group, Abelian Group, Properties of Group,Cyclic Group, Coset Decomposition and Related Theorem.

Text Book:

1. C.L. Liu & Mahopatra, Elements of Discrete mathematics, 2nd Sub Edition 1985, Tata McGraw Hill

Recommended Books:

1. Rosen, Discrete Mathematics and Its Applications, Sixth Edition 2006

B.Sc.(IT)(H)(CBCS)

Semester-II

SUBJECT NAME: INFORMATION SECURITY AND CYBER LAWS

Unit-1

Security principles, threats and attack techniques: Cyber Security, Cyber Security policy, Information security, Security triad: Confidential, Integrity, Availability, Security threats and attacks, threats security, Weak / Strong Passwords and Password Cracking, Insecure Network connections, Malicious Code, Programming Bugs, Different Viruses and worms.

Unit2

Authentication and access control: Identification, Authentication, Authentication by passwords, Access control structures, Types of access control.

Cryptography and Network security: Cryptographic mechanisms, Digital signatures, Encryption, digital signature certification, suspension and revocation of digital signature certificate, Protocol design principles, Firewalls, Intrusion detection, Active/ Passive– Interference, Interception, Impersonation ,Worms .

Unit-3

Protection measures: Business risk analysis, Prevention, detection and response , Security Policies, Security Procedures and Guidelines , Business Continuity and Disaster Recovery.

Legal and Ethical Issues: Protection of data and Information Laws, Employees rights, Software failure, Computer Crime, Privacy, and Ethics

Unit-4

Cyber crime and IT Act: Cyber Governance Issues, Cyber User Issues, Cyber Crime and Offences, Overview of IT Act, 2000, Amendments and Limitations of IT Act, Electronic Governance, Legal Recognition of Electronic Records, Cyber Crime and Offences, Concept of domain names, new concept in trademark and dispute, cyber squatting, reverse hijacking, spamming.

Unit-5

Hacking: Introduction of hacking, hacking, criminal hacking vs. Ethical hacking.

IPR: Ethical Issues in intellectual property right, copy right and related rights, patent and related rights, Trade Marks and rights arising from Trademark registration, software piracy, plagiarism. Indian Legislations for the protection of various types of Intellectual Properties**,** Database, web and Mobile Security,Authentication in distributed systems

TextBooks:

1. Cyber laws and syber security in developing and emerging economies, Zeinab Karake-Shalhoub, Luna Al Qasimi
2. Computer Security, Dicter gouman, John Wiley & Sons

Reference Books

1. Computer Security: Art and Science, Mathew Bishop, Addison-Wisley
2. Computer Security, 2nd ed. Author: Dieter Gollmann Publisher: John Wiley & Sons, 2006 ISBN: 0-470-86293-9

B.Sc.(IT)(H)(CBCS)
Semester-II

SUBJECT NAME: APPLIED ELECTRONICS

UNIT I:

SEMICONDUCTOR DIODE: Metals, Insulators and Semiconductors, P-type and N-type semiconductor with energy level diagram ,PN junction Barrier voltage, Forward biased & reversed biased junction ,Diode symbol, circuit diagram for characteristics (forward & reversed) Characteristics, diode equation. Zenerdiode,Tunnel diode, photo diode, varactor diode.

UNIT II:

TRANSISTOR: Types of Transistor, Formation of a transistor P-N-P & N-P-N transistor working, symbol, Leakage current in a transistor , Relationship between alpha & beta Common Base configuration, Common Emitter configuration, Common collector configuration, input and output characteristics of CB, CE and CC configurations.

UNIT III:

LOGIC FAMILY: RTL, TTL, DTL, ECL, IIL, GTL, CMOS, PMOS, NMOS,

UNIT IV:

TRANSISTOR BIASING: D.C & A.C load line, procedure for drawing load line, operating point Biasing of a transistor, need for biasing (give reason) ,method of biasing ,fixed battery method, emitter resistances method, potential divider method Biasing techniques, transistor as an amplifier.

UNIT V:

FIELD EFFECT TRANSISTOR: Field Effect Transistor (FET): Construction of JFEET, idea of channel formation, pinch- off, voltage, Transfer and output characteristics.

MOSFET: Basic construction of MOSFET and working, I-V characteristics, enhancement and depletion modes, Complimentary MOS (CMOS), BiCMOS.

Text Books:

1. Principle of Electronics by V K Mehta

Reference Books

1. Basic electronics B.L THAREJA

List of practical:

1. Study of resistor.
2. Study of capacitor.
3. Study of inductor.
4. Study of diode.
5. Study of transistors.
6. To study the V-I Characteristics of Diode – Ordinary and Zener.
7. To study the V-I Characteristics of the Common Base, Common Emitter, Common collector configuration of BJT.
8. To draw the V-I Characteristics of the FET configuration.
9. To familiarize the application of TTL and CMOS characteristics.
10. To study the V-I Characteristics of MOSFET.