

DEVI AHILYA VISHWAVIDYALAYA, INDORE, (M.P.)

SEMESTER WISE SCHEME AND
SYLLABUS FOR
BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)
2018-19 Academic Year ONWARDS

Sandy

Devitaki

5/10/18

BCA PART I Semester –Scheme: 2018-19 and Onwards

BCA - I Examination Scheme

Subject	Theory Max. Marks		Practical Max	Max. Mark	Min
	Internal	External			
BCA -101 Mathematics -I	10	40	-----	50	4+13
BCA -102 Statistics -I	10	40	-----	50	4+13
BCA -103 Programming & Problem solving through C -I	-----	50	-----	50	17
BCA -104 PC Software	-----	50	-----	50	17
BCA -105 Digital Computer Organization	10	40	-----	50	4+13
BCA -106 English	10	40	-----	50	4+13
BCA -107 Programming & Problem solving through C –I Practical	-----	-----	25	25	9
BCA -108 PC Software Practical	-----	-----	25	25	9
Total Marks	40	260	50	-----	-----
Grand Total	-----	-----	-----	350	-----

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

Sandef *Dantali*

5/10

BCA PART I Semester –Scheme: 2018-19 and Onwards

BCA - II Examination Scheme

Subjectss	Theory Max. Marks		Practical Max Marks	Max. Marks	Min Marks
	Internal	External			
BCA -201 Mathematics –II	10	40	-----	50	4+13
BCA -202 Statistics -II	10	40	-----	50	4+13
BCA -203 Programming & Problem solving through C -II	-----	50	-----	50	17
BCA -204 Introduction to Information System	-----	50	-----	50	17
BCA -205 Operating System Fundamentals	10	40	-----	50	4+13
BCA -206 Hindi	10	40		50	4+13
BCA -207 Practical- Programming & Problem solving through C -II	-----	-----	25	25	9
BCA -208 Practical (Introduction Information System)	-----	-----	25	25	9
Total Marks	40	260	50	-----	-----
Grand Total	-----	-----	-----	350	-----

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

Sandily *Arinahi*

SEMESTER – 1

BCA -101: MATHEMATICS – 1

Max. Theory Marks: 40

Min. Theory Marks: 13

OBJECTIVES: This course aims to familiarize the students with the basics of functions, limits, differentiation, vector and matrix operations. The application of the gained knowledge is expected to help students in solving real world problems and develop IT applications for scientific computing.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT - I

Review of concepts of function of one variable: define a function. Types of function:

Limits: define working rule for finding out the limit, fundamental property of limit, problems based on limits:

Continuity: define point of discontinuity, classification of discontinuity, problems based on continuity & discontinuity

Differentiability: condition for derivability and problems.

UNIT - II

Successive differentiation, Rolles theorem, Mean value theorem, Taylor's theorem, Taylor's & Maclaurin's series, Intermediate forms.

UNIT - III

Tangents, Normal, Curvature, asymptotes, integration of hyperbolic function and reduction formula

UNIT - IV

Differentiation of vector function, gradient, directional derivatives, divergence and curl, vector function of several scalar variables and their partial derivative, level surface gradient in Cartesian and polar coordinates, divergences of vector and curl of a vector.

UNIT - V

Matrix – definition, types of matrix, special matrix elementary transformation of matrix, inverse of matrix – adjoint methods and Gaussian elimination, normal form of matrix, rank of matrix, nullity of matrix (their applications) consistency and solution of linear simultaneous equations.

TEXT BOOK:

A text book of calculus by Dr. H.K.Pathak, & D.C. Agrawal 2010

REFERENCE BOOKS:

1. A text book of calculus by Dr. H.S.Sharma, Ratan Prakashan
2. Vector Calculus & Geometric by Dr. H.K.Pathak, & D.C. Agrawal
3. Discrete Mathematics by Dr. H.K.Pathak, & D.C. Agrawal – (shikha sahitya prakashan)

Sandilya
Ranitaki

BCA -102: STATISTICS - I

Max. Theory Marks: 40

Min. Theory Marks: 13

OBJECTIVES: The aim of this course is to expose students to basics of statistics and its application in solving statistical problems. The course will help to prepare the foundations required for data mining, data science and big data analytics.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT I

Variables & graphs: Statistics, population & sample, discrete & continuous variables, graphs, equations, inequalities, logarithms, Frequency distributions: frequency distributions, histogram, frequency polygons. Frequency curve, cumulative frequency distribution, ogives.

UNIT II

Measures of central tendency : The arithmetic mean, weighted arithmetic mean, geometric mean, harmonic mean, mean power of numbers, root mean square, median, mode, quartiles, deciles & percentiles.

Measures of dispersion: The range, mean deviation, semi inter quartile range for quartiles, deviation, absolute & related dispersion, coefficient of variation.

UNIT III

Moments skewness & kurtosis: Moments of various types, relation between moments, sheppard's correction to moments, skewness & kurtosis, moment generating function.

Elementary probability theory: sample space, events, classical definition of probability, relative frequency definition, theorems of total & compound probability, Independent & dependent event, mutually exclusive event, mathematical expectation.

UNIT IV

Theoretical distributions discrete & continuous probability distribution. Basic concepts & applications of degenerate, Bernoulli, Binomial, geometric negative binomial. Hyper geometric & Poisson distributions, normal distribution

Curve fitting & the method of least squares: curve fitting the method of least square, the least square lines, the least square parabola, regression.


UNIT V

Correlation theory: Linear correlation, Measures of correlation, the least square regression lines expected & unexpected variation, coefficient of correlation, rank correlation, correlation index, multiple & partial correlation for three variables;

Theory of attributes: Consistency of data, association of attributes, coefficient of association, contingency tables.

REFERENCE BOOKS :

1. Statistics schaum's outline series, Spiegel, M.R.McGraw Hill Publishing Company.
2. Mathematical statistics Kapoor & Saxena : - S,Chand & sons.

Sandy *Bairali* 

BCA-103: PROGRAMMING & PROBLEM SOLVING THROUGH C -I

Max. Theory Marks: 50

Min. Theory Marks: 17

OBJECTIVES: This course aims to familiarize students with basic primitives of C language through decision control statements, loop control statements, arrays and structures. After completion of this course the student is expected to write efficient programs in 'C' language. The main focus is on problem solving techniques, algorithm design and writing efficient programs.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT -I

Algorithm for problem solving: An Introduction, Properties of an algorithm, classification, algorithm logic, flowchart.

Program design and implementation issues: programming system design technique, programming technique, basic constructs of structured programming, modular designing of programs.

Programming Environment: High level programming language, Low level programming language, Middle level programming language, assembler, compiler, interpreter.

UNIT- II

Introduction to C, Historical development of C.

Getting started with C : The C Character set, Types of C Constants , Types of C Variables, C keywords, identifiers literals.

C Instructions : Type Declaration Instruction, arithmetic Integer, Long, Short, Signed, unsigned, storage classes, Integer and Float Conversions, type conversion in assignment, hierarchy of operations.

UNIT - III

Operators: Logical operators, hierarchy of logical operators, arithmetic operators, relational operators, assignment operators, increment and decrement operators, conditional operators, bit wise operators, special operators, "&,*,,>,"sizeof"

Decision Control Structures: control instructions in C, if, if-else, switch statement

Loops control structures : while loop, for loop, do - while loop, odd loop, nested loop, break , continue, goto, exit statement

UNIT -IV

Array: Introduction, array initialization, bound checking, 1D array, 2D array initialization of 1D and 2D array, memory map of 1D and 2D array, Multidimensional array.

Strings: Introduction, standard library string function strlen(), strcpy(), strcat(), strcmp(), 2D array of characters.

UNIT -V

Structure : Use of structure, declaration of structure, accessing structure elements, how structure elements are stored, array of structure, uses of structure

Preprocessor: features of C Preprocessor, macro expansion, macro with arguments, file inclusion, conditional, #if, #elif, miscellaneous directives, #include, #define, #undef, #pragma directives.


Sandy *Barati* 

TEXT BOOK:

Y. Kanetkar, "Let us C", BPB Publications

REFERENCE BOOKS:

1. Programming with problem solving thought 'C'. (ELSEVIER)(for UNIT I)
2. "Programming in C", E. Balaguruswamy Tata McGraw Hill
3. "C The Complete Reference", H. Schildt, Tata McGraw Hill
4. First course in programming with 'C', T.Jeyapoovan (VIKAS)
5. The C Programming language by Brian W. Kernighan Dennis M. Ritchie
Prentice Hall
6. Practical C Programming 3rd Edition A Nutshell Handbook O'Relly.
7. Computer Programming and IT (for RTU), by Ashok N Kamthane et. al, Pearson
Education, 2011

Sanely *Arithali* 


BCA – 107 Programming & Problem solving through C -I –LABORATORY

Max. Marks :25

Min. Marks : 09

List of practicals:

1. Write a C program to display "Hello Computer" on the screen.
2. Write a C program to display Your Name, Address and City in different lines.
3. Write a C program to find the area of a circle using the formula: $\text{Area} = \text{PI} * r^2$
4. Write a C program to find the area and volume of sphere. Formulas are: $\text{Area} = 4 * \text{PI} * R * R$ $\text{Volume} = 4/3 * \text{PI} * R * R * R$.
5. Write a C program to print the multiply value of two accepted numbers.
6. Write a C program to convert centigrade into Fahrenheit. Formula: $C = (F - 32) / 1.8$.
7. Write a C program to read in a three digit number produce following output (assuming that the input is 347)
3 hundreds 4 tens 7 units
8. Write a C program to read in two integers and display one as a percentage of the other.
Typically your output should look like 20 is 50.00% of 40
assuming that the input numbers where 20 and 40. Display the percentage correct to 2 decimal places.
9. Write a C program to find out whether the character presses through the keyboard is a digit or not (using conditional operator).
10. Write a C program to swap variable values of i and j.
11. To sum n difference number using array.
12. To generates Fibonacci series.
13. Find the sum of series.
i) $1 + 2 + \dots$ ii) $2 + 4 + \dots$ iii) $1 + 3 + \dots$ iv) $1 + 2/2! + 3/3! + \dots$
v) $1 + x/1! + x^2/2! + x^3/3! + \dots$
vi) $1 - x/1! + x^2/2! - x^3/3! + \dots$
14. Find the factorial of given number using for loop
15. Find whether given year is leap or not.
16. Write a C program to find the maximum from given three nos.
17. Write a C program to find that the accepted no is Negative, Positive or Zero.
18. Write a program which reads two integer values. If the first is lesser print the message up. If the second is lesser, print the message down if they are equal, print the message equal if there is an error reading the data, print a message containing the word Error.
19. Write a C program that prints the given three integers in ascending order using if – else.
20. Given as input three integers representing a date as day, month, year, print the number day, month and year for the next day's date.
Typical input: "28 2 1992" Typical output: "Date following 28:02:1992 is 29:02:1992".
21. Write a C program for calculator designing using switch /case loop?
22. Write a C program to convert decimal to binary.
23. Write a C program to convert decimal to octal.
24. Write a C program to convert decimal to hexadecimal.
25. Write a C program to find the sum of first 100 natural nos.
26. Write a C program to find the sum of first 100 odd nos. and even nos.
27. Write a C program to display first 25 Fibonacci nos.
28. Write a C program to display first 100 prime nos.
29. Write a C program to find factorial of accepted nos.
30. Write a C program to find the sum of digits of accepted no.
31. Write a C program to print the accepted no and its reverse no.
32. Write a C program to print all the Factors of accepted no.

Samal *Arutali* 

33. Write a C program to find HCF of two given numbers.
 34. Write a C program to find all the prime number between two given numbers.
 35. Write C programs to print the terms of each of the following series:
 i. $\sin(x)$ ii. $\cos(x)$ iii. $\log(1+x)$ iv. $\log(1-x)$ v. e^x vi. e^{-x}
 36. Write a C program to print the sum of series.(will be given in class)
 37. Display the following output on screen (assuming the value for input parameter n=5) :

a. * ** *** **** *****	b. 1 12 123 1234 12345	c. A AB ABC ABCD ABCDE	d. 1 23 345 4567 56789	e. 1 23 456 78910 101112131415
f. ***** **** *** ** *	g. ABCDE ABCD AE AB A	h. * *** ***** ***** *****	i. 1 123 12345 1234567 123456789	j. 1 121 12321 1234321 123454321
k. * ** *** **** *****	l. ABCDE ABCD AE AB A	m. 1 12 123 1234 12345	n. ***** 0000 *** 00 *	o. 1 10 101 1010 10101
p. 1 01 101 0101 10101	q. 1 22 333 4444 55555	r. A AB ABC AB A	s. ABCDEDCBA ABCD DCBA AE CBA AB A A	t. 1 121 12321 1234321 123454321

38. Write a C program to find minimum, maximum, sum and average of the given one dimensional array.
 39. Write a C program to perform the basic Matrix operations addition, subtraction, multiplication, Transpose.
 40. Write a program to take a sentence as input and reverse every word of the sentence.
 41. Write a program to find length of a string.
 42. Write a program that accepts two strings and concatenate them.
 43. Write a program to reverse a string entered by user.
 44. Accept a string and convert it to uppercase string.
 45. Write a program to count the number of words in a string.
 46. Write a program to count the vowels, consonants and other special characters in the input string.
 47. Write a program to take a sentence as input and reverse every word of the sentence.

NOTE:

1. Every student will be given 6 period /week laboratory(1 period: 45 minutes)
2. Every student will be work on independent computer (student: computer =1:1)

Sanjay Daitali

BCA – 104: PC SOFTWARE

Max. Theory Marks: 50

Min. Theory Marks: 17

OBJECTIVES: The course aims to make students understand the working of Windows Operating systems and database management systems. The students will be familiarized with the Microsoft Office packages. This course will help the students to operate the computers well and use the software packages effectively.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT I

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screen saver and appearance. Using windows accessories.

UNIT II

Documentation Using MS-Word - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT III

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation.

UNIT IV

Database Management using MS Access: Creating Database, Tables, primary key, Relationship, Forms and Reports, DBMS Queries.

UNIT V

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

TEXT BOOK:

Learn Microsoft Office – Russell A. Shultz – BPB Publication

REFERENCES BOOKS:

1. Microsoft Office – Complete Reference – BPB Publication
2. Courter, G Marquis. Microsoft Office 2000: Professional Edition. BPB.
3. PC Software – Shree.Sai Prakashan, Meerut

Samal Chaitali

BCA- 108 PRACTICALS (PC SOFTWARE)

Max. Marks :25

Min. Marks : 09

Practical based on DOS: introduction to PCs with related Hardware, software, DOS its variations, and Starting DOS.

DOS Commands: internal External Commands, common Commands notation, files & file command, Disk Command, Batch files introduction to batch processing, creation of batch file special batch file, autoexec.bat hard disk setup, configuring a system, creation of subdirectories, pipelines, filter and miscellaneous.

WINDOWS

1. Creating folder, cut, copy, paste, managing file and folder in windows.
2. Arrange icons, set display properties
3. Adding and removing software and hardware
4. Setting date and time, screen saver and appearance.
5. Using windows accessories.
6. Settings of all control panel items
7. Search file
8. Windows – 2000 Desktop setting – new folder, rename, recycle bin operation, briefcase, control panel utility, Display properties, screen saver, background setting.

MS-Word

1. Creating & Editing Document
2. Formatting Document
3. Use of Auto-text, Autocorrect, Spelling and Grammar Tool,
4. Page Formatting, Page Border, Background,
5. Creation of MS-Word-Mail Merge, Macros, Tables.
6. Practice of Printing, page setup etc.

MS-Powerpoint

1. Creating, Manipulating & Enhancing Slides,
2. Inserting Organizational Charts, Excel Charts
3. Using Word Art
4. Putting Animations and Sounds
5. Inserting Animated Pictures
6. Inserting Recorded Sound Effect

MS-Excel


1. Creating & Editing Worksheet, Fill Handle
2. Use Formulas and Functions
3. Preparing Charts

MS-Access

1. Creating Database using template and blank database
2. Creating Tables using datasheet view and design view
3. Creating Relationship
4. Creating Query using query wizard and query design
5. Creating Reports
6. Creating Forms

NOTE:

1. Every student will be given 6 period /week laboratory(1 period: 45 minutes)
2. Every student will be work on independent computer (student: computer =1:1)

Samal *Radhika* 

BCA-105-DIGITAL COMPUTER ORGANIZATION

Max. Theory Marks: 40

Min. Theory Marks:13

OBJECTIVES: The course covers the basic principles of computer hardware organization, peripherals, operations and their assembly. The course highlights the role of Number System, Logic Gates, Flip flops and Memory units in processor design. The students will understand basic computer organization which will act as the base of understanding other complex modern computer architectures like cloud. It will also prepare the students to understand the code generation process of compiler and develop efficient programs.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT I

Block diagram of Computer, Stored program Concept, Word length and processing speed of the Computer, User interface, Hardware/Software Concepts, Microprocessor and Single chip microprocessor concepts.

Input and Output devices: Keyboard, mouse, joystick, scanner. Printers: printers and types of printers, plotters and display devices.

UNIT II

Number system and codes. Decimal, binary, octal, hexadecimal and their inter conversion. ASCII, grey code excess-3 code, BCD numbers, binary addition, subtraction, multiplication and division (1's and 2's compliment methods)

UNIT III

Logic gates: NOT, OR, AND, NAND, NOR, XOR, XNOR gates. Boolean Algebra, De Morgan's Theorem. Application of gates, half adder and full adder.

Boolean functions & truth table, Simplification of logical circuits using Boolean algebra, SOP, POS, and Karnaugh maps.

UNIT IV

Flip- Flop, Registers and counters, RS-flip flop, level clocked D,F/P edge triggered D flip flop , edge triggered JK flip flop , racing in F/F, JK masters-slave flip flop, buffer registers, shift registers, ripple counters, synchronous counters , ring counters, Mod Counters.

UNIT V

Computer Memory: memory cell, memory organization, Random Access Memory, Read Only Memory, PROM, EPROM, EEPROM, building large memories, magnetic hard disk, pen drive, Cache memory, optical disk.

Transfer of information between I/O devices, CPU and Memory.


Sandeep *Arifali* ~~*AS*~~

TEXT BOOK:

Digital Design by M. Morris Mano, Prentice Hall of India Pvt. Ltd.

REFERENCE BOOKS:

1. Digital Computer Electronics by Malvino and Brown, McGraw Hill
2. Computer Fundamental Architecture and Organization by B. Ram
3. Computer Architecture and Organization by Nicholas Carter, Schaum Series TMH Adaptation.
4. Computer Organization by Hayes.
5. Computer Fundamentals by P. K. Sinha & Priti Sinha , BPB Publications.

Sandya *Arifati* 

BCA – 106 : ENGLISH

Max. Theory Marks: 40

Min. Theory Marks: 13

OBJECTIVES: This course is intended to improve the written and verbal communication skills of the students. The knowledge gained will help the students to better understand the requirement documents, prepare technical reports and training material in IT industry.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

Syllabus:

UNIT – I : Short- answer question.

UNIT – II : Reading Comprehensive and vocabulary.

UNIT – III : paragraph writing.

UNIT – IV : Letter Writing (both formal & informal)

UNIT – V : Grammar(20 Items from the prescribed text book to be asked and 15 to be attempted)

Structural Items :

1. Simple. Compound and complex sentences

2. Co-ordinate clauses (with, but, or, either-or, neither-nor, otherwise or else)

i) Subordinate clauses-noun, clause-as, subject object and complement : Relative clauses (restrictive and non- restrictive clauses): adverb Clauses(open and Hypothetical conditional with because, thought, here, so that, as soon as)

ii) Comparative clauses (as+=adjective/adverb + as-no sooner.....Than)

Tenses :

i) Simple present, progressive present perfect

ii) Simple past, progressive and past perfect

iii) Indication of futurity The passive (Simple present and past, present and past perfect and to infinitive structure) reported speech : i) declarative sentences, ii) imperatives, iii) Interrogative-wh-question. Exclamatory sentences.

iv) Modals (Will, Shall, Should, Would, Ought to, have to/ have got to, Can-could, may- might and need) Verb structures (infinitives and gerundial), Linking Devices

The above language items will be introduced to express the following communicative functions:

a) Seeking and imparting information.

b) Expressing attitudes- intellectual and emotional.

c) Persuasion and dissuasion etc.

Questions on all the units shall be asked from the prescribed text which will comprise specimens of popular creative writing and the following items:

i) Indian art Meaning of art Features of Indian art Elementary knowledge of paintings, music, dancing, Sculpture, Archaeology, Iconography and other social arts.


ii) Indian Literature ancient Indian Literature Elementary Knowledge of Vedic Literature, Mahabharat, Ramayan and other main Granthas.

iii) Indian freedom struggle. Freedom struggle of 1857 national consciousness, non-cooperation movement, Civil disobedient movement, contribution of revolutionaries in freedom struggle.


iv) Indian Constitution: Introduction, main features of Constitution, fundamental rights, fundamental duties.

TEXT BOOK :

English Language and Indian Culture: publication by M. P. Hindi Granth Academy

Sandip *Arifali* 

SEMESTER – II

Somali *Darilali* 

BCA – 201: MATHEMATICS – II

Max. Theory Marks: 40

Min. Theory Marks: 13

OBJECTIVES: This course aims to familiarize the students with the basics of Curve tracing, Gamma and Beta functions, integration, differentiation, maxima and minima functions. The application of the gained knowledge is expected to help students in solving problems for scientific computing.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT – I

Curve Tracing : Tracing curves with equations in Cartesian & Polar forms.

Improper integrals : Convergence of improper integrals. Evaluation of Convergent improper integrals.

UNIT – II

Gamma and Beta function and their properties, some important deductions (duplication formula)

Rectification L length curve, intrinsic equation.

UNIT – III

Multiple integrals : Integration of functions of two & three variables, Double & triple integrals, Dirichlet integral use double & triple integral in finding areas and volumes.

Vector Integration : Indefinite and definite, surface and volume integrals, Gauss and Stokes theorems and some applications.

UNIT – IV

Partial Differential: Function of several variables, Limits, Continuity and Differentiability,

Partial Derivatives, Euler's Theorem, Mean Theorem & Taylor's Theorem.

UNIT – V

Maxima & Minima function of two and three variables.


Convergence and Divergence of series: Definition and various tests.

TEXT BOOK:

A text book of higher calculus for B.Sc II by Dr. H. S. Pathak & D.C. Agrawal . Shikha Sahitya Prakashan.

REFERENCE BOOK:

A text book of higher calculus for B.Sc II by Dr. H. S. Sharma Ratan Prakashan.

Sanjay *Arati* 

BCA – 202: STATISTICS – II

Max. Theory Marks: 40

Min. Theory Marks: 13

OBJECTIVES: This course is designed to use and apply advance statistical measures like estimation theory, hypothesis testing, Significance testing, Test Design and Analysis of variance in real world problems. The knowledge imparted to students will help them to better analyze data required for effective decision making.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT- I

Estimation Theory : Unbiasedness, Consistency, efficiency and sufficiency of estimations, Maximum likelihood estimates and their properties (without proof), Cramer Rao Inequality and Minimum variance estimates.

UNIT- II

Testing of Hypotheses : Simple and composite hypothesis, error of kind-I and kind – II, critical region, level of significance, size and power of a test, Neymann Pearson's fundamental lemma and its application(with Proof)

UNIT – III

Test of significance: Test of simple hypothesis, Beta, gamma distributions and properties, Chi-square, T, F, Z distribution and test based on them.

UNIT – IV

Non- parametric Test : Sign test, Median test, Wilcoxon's run test, Wilcoxon's signed rank test. Contingency tables.

UNIT- V


Analysis of Variance : one –way & Two – way classification with one observation per cell, basic designs of experiments : completely randomized design, randomized block design & latin square design.

TEXT BOOK:

Mathematical Statistics by J. N. Kapoor & H.C. Saxena , S. Chand & co.

REFERENCE BOOK:

Fundamental of Statistics Vol. 1 M. Goon, B. Dasgupta, M.K. Gupta, The World Press Pvt. Ltd.

Sandeep Daitalo 

BCA -203: PROBLEM SOLVING AND PROGRAMMING THROUGH C -II

Max. Theory Marks: 50

Min. Theory Marks:17

OBJECTIVES: This course is designed to provide a comprehensive study of C language primitives like functions, pointers, files and graphics. It will help to provide students the knowledge of writing modular code. The main emphasis of the course will be on developing efficient pointer based programs.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT – I

Functions: definition, declaration, calling & use. passing values b/w function, scope rule of function.

Advanced feature of functions: Function declaration & prototypes, call by value, call by reference, back to function calls, macro verses function, Recursion, need of recursion, types of recursion.

UNIT- II

Pointer: Definition & declaration, pointer assignment, pointer & arrays, passing entire array to function, pointers & 2D array, pointers array, pointer to array, array of pointer to string, Pointer to structures, uses of pointers, malloc(), calloc(), realloc(), free() library function.

Union: Union definition & declaration, accessing a union member, union of structures, initialization of union member, uses of union, use of user defined data types

UNIT-III

Types of I/O, Console I/O function, Formatted console I/O function, sprintf(), sscanf(), unformatted consol I/O functions.

Disk I/O function: File opening modes, reading and writing, closing files., String I/O in files, formatted disk I/O function, text verses binary mode, record I/O in files, detecting error in reading & writing, Command line arguments.

UNIT-IV

Components of VDU: Display Adapters, Display Screens (monitor), Video Display modes, resolution

Text or Graphics: Color in text in modes, color in graphic mode, video pages, writing to VDU memory in text mode.

UNIT-V

Graphic programming: lines, stylish lines, drawing & filling images, patterns with differences, bar ()

Filling regular & non-regular shapes, palettes & colors, outputting text, justifying text, animation basics.


TEXT BOOK:

Let Us 'C' by Y. Kanetkar , BPB Publication.

Sandy *Anita*

REFERENCE BOOKS:

1. Programming in 'C' Balaguruswami.
2. First course in Programming with 'C' by T. Jeyapoovan(VIKAS)
3. The C programming Language by Brain W. Kernigham and Dennis M. Ritchie
4. Practical C programming, 3rd edition(anetshell handbook)O'Relly
5. Computer Programming and IT (for RTU) by Ashok N Kamthane et. al,
Pearson Education, 2011

Samuel *Aritha* 


**BCA -207 PRACTICAL
PROGRAMMING & PROBLEM SOLVING THROUGH C -II**

Max. Marks:25

Min. Marks: 09

List of Practical's:


1. Write program to find square root of a number without using built in function
2. To find factorial of a no. using recursion
3. To reverse digit of number
4. To reverse the given string
5. Write a C Function for the following task
 - a. Calculating Factorial
 - b. Find value of a given Fibonacci term
 - c. Swapping the values of two variable
 - d. Minimum/maximum value from the given input
6. Write User Defined Function and test them in the main program for the following standard functions
 - a. int myatoi(Char *s)
 - b. char *myitoa(int i)
 - c. int mystrlen(char *s)
 - d. char *mysubstr(char *s, int i, int j)
 - e. char *mystrcat(char *s1, char *s2)
 - f. int mystrcmp(char *s1, char *s2)
 - g. int mystrchr(char *s, char c, int i)
 - h. char *mystrrev(char *s)
 - i. int mystrend(char *s, char *t)
 - j. char *myreplace(char *s, char *old, char *new)
 - k. int abs(int i)
 - l. char *mytoupper(char *)
 - m. char *mytolower(char*)
 - n. int isupper(char *s)
 - o. int islower(char *s)
 - p. int mypower(int a, int b)
7. Write a program which ask date of birth in dd/mm/yy format and spell it in word.
8. To find out twins prime number.
9. To enter a four digit number and print it in all combination.
10. Write a program to remove duplicate elements in an array.
11. Write a program to sort the names in an array.
12. Write the following recursive C Function
 - a. Factorial of a given number
 - b. Nth Fibonacci number
 - c. Reverse of a given String
 - d. Reverse of a give Number
 - e. Sin(x)
13. Write a program that creates a record having five fields and create a structure array. Accept the records of the students. Accept a name of student and search it. Print the details if the record is found else print error message.
14. Write a C program to exchange the value of two variable using function.
15. Write a program to add two number using pointer
16. Write a program to create a file and write data into it.

Sandy Daitali 

17. Write a program to open an existing file, read data from it and display it on the screen.
18. Write a C program to create a file of integers and write data into the file. Open the file, read numbers from it and write even and odd numbers to separate file.
19. Write a program to append contents into an existing file.
20. Write a program that merges the contents of two file and write it in the third file.
21. Write a program that copies the contents from one file to another.
22. Write a program to read character from one text file convert into upper case and write into other file.
23. Write a C program that creates an Employee text file. The fields of the records are empid, empname, designation, qualification, salary, experience, no. of papers publishesd, address, city, and phone no. The program must implement the operation to modify a record, delete a record and append new records.
24. Write a payroll program using file handling
25. Write a mark sheet program using file handling
26. Write C programs for the following operation to work like DOS Commands (use command line arguments):
 - a. type abc.txt
 - b. copy source1.txt source2.txt
 - c. copy source1.txt source2.txt source3.txt source4.txt
 - d. compare source1.txt source2.txt
 - e. concat source1.txt source2.txt
27. Write a C program to open two files containing integers (in sorted order) and merge their contents.
28. Write a C program to count the number of vowels, consonants, digits, spaces, other symbols, words and lines in a given text file.
29. Write C code to check if an integer is a power of 2 or not
30. Write a C program to count bits set in an integer.
31. Write a C program to set a particular bit in a given number.
32. Write a C program to reset a particular bit in a given number.
33. Write a program to display rainbow.
34. Write a C program to implement moving car.
35. Write a program that displays a bouncing ball.
36. Write a program that displays a rotating fan.

NOTE:

1. Every student will be given 6 period /week laboratory (1 period: 45 minutes)
2. Every student will be work on independent computer (student: computer =1:1)

Sandip *Daitali* 

BCA 205: INTRODUCTION TO INFORMATION SYSTEM

Max. Theory Marks: 50

Min. Theory Marks: 17

OBJECTIVES: The main objective of this course is to provide students with an overall understanding of the information systems and to highlight the importance of information systems in modern organizations. This course will help the student to understand different types of information systems, system development life cycle, communication systems and the concept of E-commerce.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT I: Introduction to Information System: Definition, Meaning of Information System, System Concept, Need to learn Information System, Competitive advantage, Careers in Information System. Fundamentals of Data Processing, Components of Computer system, Applications of Computer Based System.

UNIT II: A System Approach to Problem Solving: The Scientific Method, The System Approach, Understanding a Problem or opportunity, Developing & Implementing a solution, A System Solution Methodology, Applying the Solution Methodology. Types of Information Processing System: Overview of six major types of systems - Transaction Processing System, Office Automation System, Knowledge Work Systems, Management Information System, Decision Support Systems and Executive Support System.

UNIT III: System Concepts and The Information Systems Environment: The System Concept: Definition, Characteristics of a System, Central Objective, Element of a system, Types of Systems, The Systems Development Life Cycle: Recognition of Need, Feasibility Study, Analysis, Design, Implementation and The Role of System Analyst.

UNIT IV: The Meaning and use of MIS system in view of Business, Process of MIS, **System Design:** System Design Consideration, input/output design, forms design, file organization and database, data management, file design.

UNIT V:

E -Commerce: Introduction to E-Commerce, types of E-commerce, E-Commerce Applications, electronic payment systems. Overview of Communication System, Use and functioning of the internet, WWW, Digital Marketing, Search Engine Optimization.

Text Books:

1. Ralph Stair , "Principle of Information System", Thomson course technology.
2. Elias M. Awad, "System Analysis and Design", Galgotia Publishing Pvt. Ltd., New Delhi.

Reference Books:

1. James A Senn, "Analysis and Design of Information Systems", McGraw-Hill Publishing Company, Delhi.
2. Muneesh Kumar, "Business Information Systems", Vikas Publishing House Pvt. Ltd., New Delhi.
3. James A. O'Brien, "Management Information System", Galgotia Publications Pvt. Ltd. New Delhi.
4. Kenneth C. Laudon & Jane P. Laudon,"Management Information System", Prentice Hall of India Ltd., New Delhi

BCA 208: PRACTICAL

INTRODUCTION TO INFORMATION SYSTEM


Max. Marks: 25

Min. Marks: 09

1. Exposure to Internet, Web Browser, Search engines and Search Engine Marketing, Digital Marketing.
2. Email creation, email writing ethics, campaign creation and management.
3. Key Word Analysis and Web Page ranking.
4. Understanding and creating Google form, Google Adword and Adword Analytics.
5. Search Engine Optimization.
6. Exposure to Social Media, Social Media Mining, Marketing through Face book.
7. YouTube including creating a channel on YouTube.
8. Social Media Measuring, Monitoring, Reporting, Tracking and Monitoring platforms.
9. Creating and Using Blog.
10. Use of Blogs for Forum and discussion.

Reference Books:

1. Raghvendra K., Shruthi Prabhakar, "Digital Marketing", Himalaya Publishing House, Mumbai.

Sandef *Raitali* 

BCA-205: OPERATING SYSTEM FUNDAMENTALS

Max. Theory Marks: 40

Min. Theory Marks: 13

OBJECTIVES: The objective of the course is to provide basic knowledge of operating system modules like process and memory management. The student after completion of the course will be able to understand the internal working of an operating system that will help in identifying and troubleshooting application errors.

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

UNIT I

Introduction to Operating Systems, Operating system services, multiprogramming, time sharing system, storage structures, system calls, multiprocessor system, Device Management, Device Drivers.

UNIT II

Process concept, Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling I/O devices organization, I/O buffering.

UNIT III

Inter-process communication, precedence graphs, critical section problem, semaphores, Classical problems of synchronization.

UNIT IV

Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.

UNIT V

Concepts of memory management, logical and physical address space, swapping, contiguous and non-contiguous allocation, Concepts of virtual memory, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation.


TEXT BOOK:

Operating System Concepts, Addison Wesley, 4th Edition, A. Silberschatz and P. Galvin.

Latest Edition.

REFERENCE BOOKS:

1. Operating System by Deitel
2. Operating systems, 4th Edition, William Stallings, Pearson Education, 2003.

Sandali *Deitalk* 

BCA-206: HINDI LANGUAGE

Max. Theory Marks: 40

Min. Theory Marks: 13

NOTE:

The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/analytical/ theoretical questions.

ईकाई 1

क मानक हिन्दी भाषा:

1. मानक हिन्दी के लक्षण और उदाहरण, 2. मानक हिन्दी का स्वरूप 3. मानक हिन्दी के प्रकार

ख अशुद्धियों और उनका संशोधन:

1. अशुद्धियों के उदाहरण, 2. अशुद्धियों के प्रकार (उच्चारण गत, वर्तनी गत, शब्द और अर्थ गत, व्याकरण गत)

ईकाई 2

क हिन्दी का शब्द भंडार:

1. शब्दों के प्रकार, 2. शब्दों की रचना, 3. नये प्रयोग

ख हिन्दी की वाक्य रचना

4. वाक्यों के प्रकार, 5. वाक्य विन्यास, 6. वाक्य गत सामान्य अशुद्धियाँ, 7. विराम चिन्ह

ईकाई 3

पत्र लेखन, सार लेखन, पल्लवन:

1. पत्रों के उदाहरण, 2. पत्रों के प्रकार, 3. पत्र लेखन की विशेषताएं (पत्र लेखन, संबोधन, अंत में दिनांक आदि डालना), 4. सार लेखन, 5. पल्लवन

ईकाई 4

भारतीय संस्कृति, भारत देश और उसके निवासी, भारतीय समाज की संरचना, सामाजिक गतिशीलता – अद्यतन, कार्य और दर्शन

ईकाई 5

भारतीय संस्कृति, का विश्व पर प्रभाव, मध्य प्रदेश का सांस्कृतिक वैभव

पाठ्यपुस्तक: भारतीयता के अमर स्वर, प्रकाशन: म.प्र. हिन्दी ग्रंथ अकादमी, भोपाल।

अनुक्रमणिका

खण्ड एक: पाठ्य सामग्री

ईकाई 1	1 भारत वंदना 2 स्वतन्त्रता एकारती 3 बड़े घर की बेटी	सूर्यकान्त त्रिपाठी भनिराला जयशंकर भप्रसाद प्रेमचन्द
ईकाई 2	4. एक गधे की वापसी 5 टेलीफोन 6 अफसर	कृष्णचन्द्र हरीशंकर परसाई शरद जोशी
ईकाई 3	7 सौन्दर्य की नदी नर्मदा 8 बस्तर में बाघ	अमृतलाल बेगड़े शानी
ईकाई 4	9 बुद्ध की करुणा 10 सादगी	डॉ सिद्ध तिरस महात्मा गांधी
ईकाई 5	11 योग की शक्ति 12 शिकागो से स्वामी विवेकानन्द का पत्र	हरिवंशराय भबच्चन

खण्ड दो: हिन्दी भाषाय सम्प्रेषण कौशल

ईकाई 1	क. मानक हिन्दी भाषा ख. अशुद्धियों और उनका संशोधन
ईकाई 2	क. हिन्दी का शब्द भंडार ख. हिन्दी की वाक्य रचना और विराम चिन्ह
ईकाई 3	क. पत्र लेखन, सार लेखन, पल्लवन

खण्ड तीन: भारतीय संस्कृति

ईकाई 4	क. भारत देश और उसके निवासी ख. भारतीय समाज की संरचना ग. सामाजिक गतिशीलता घ. धर्म और दर्शन
ईकाई 5	क. भारतीय संस्कृति का विश्व पर प्रभाव ख. मध्य प्रदेश का सांस्कृतिक वैभव

Sandy *Chaitan*

DEVI AHILYA VISHWAVIDYALAYA, INDORE

REVISED - 2021

SEMESTER WISE SCHEME OF SYLLABUS
FOR

BACHELOR OF COMPUTER
APPLICATIONS (B.C.A.)

2018-19 Academic Year ONWARDS

DEVI AHILYA VISHWAVIDYALAYA, INDORE (M.P.)

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5/10/18

Raitah
5/10/18

Sandil
5/10/18

Jas
5/10/18

AKASH
5/10/18

AKASH
5/10/2018

BCA PART I Semester –Scheme: 2018-19 and Onwards

BCA - I Semester Scheme

Subject	Theory Max. Marks		Practical Max	Max. Mark	Min
	Internal	External			
BCA -101 Mathematics -I	10	40	-----	50	4+13
BCA -102 Statistics -I	10	40	-----	50	4+13
BCA -103 Programming & Problem solving through C -I	-----	50	-----	50	17
BCA -104 PC Software	-----	50	-----	50	17
BCA -105 Digital Computer Organization	10	40	-----	50	4+13
BCA -106 English	10	40	-----	50	4+13
BCA -107 Programming & Problem solving through C –I Practical	-----	-----	25	25	9
BCA -108 PC Software Practical	-----	-----	25	25	9
Total Marks	40	260	50	-----	-----
Grand Total	-----	-----	-----	350	-----

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Ashu 5/10/18

BCA PART I Semester –Scheme: 2018-19 and Onwards

BCA - II Semester Scheme

Subject	Theory Max. Marks		Practical Max Marks	Max. Mark	Min Marks
	Internal	External			
BCA -201 Mathematics –II	10	40	-----	50	4+13
BCA -202 Statistics-II	10	40	-----	50	4+13
BCA -203 Programming & Problem solving through C -II	-----	50	-----	50	17
BCA -204 Introduction to Information System	-----	50	-----	50	17
BCA -205 Operating System Fundamentals	10	40	-----	50	4+13
BCA -206 Hindi	10	40		50	4+13
BCA -207 Practical-Programming & Problem solving through C -II	-----	-----	25	25	9
BCA -208 Practical (Introduction to Information System)	-----	-----	25	25	9
Total Marks	40	260	50	-----	-----
Grand Total	-----	-----	-----	350	-----



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SEMESTER – 1

BCA -101: MATHEMATICS – 1

Max. Marks: 50

Min. Marks: 17

UNIT - I

Review of concepts of function of one variable: define a function. Types of function:
Limits: define working rule for finding out the limit, fundamental property of limit,
problems based on limits:

Continuity: define point of discontinuity, classification of discontinuity, problems
based on continuity & discontinuity

Differentiability: condition for derivability and problems.

UNIT - II

Successive differentiation, Rolles theorem, Mean value theorem, Taylor's theorem,
Taylor's & Maclaurin's series, Intermediate forms.

UNIT - III

Tangents, Normal, Curvature, asymptotes, integration of hyperbolic function and
reduction formula

UNIT - IV

Differentiation of vector function, gradient, directional derivatives, divergence and
curl, vector function of several scalar variables and their partial derivative, level
surface gradient in Cartesian and polar coordinates, divergences of vector and curl of
a vector.

UNIT - V

Matrix – definition, types of matrix, special matrix elementary transformation
of matrix, inverse of matrix – adjoint methods and Gaussian elimination, normal
form of matrix, rank of matrix, nullity of matrix (their applications)
consistency and solution of linear simultaneous equations.

TEXT BOOK

A text book of calculus by Dr. H.K.Pathak, & D.C. Agrawal 2010

REFERENCE BOOKS:

1. A text book of calculus by Dr. H.S.Sharma, Ratan Prakashan
2. Vector Calculus & Geometric by Dr. H.K.Pathak, & D.C. Agrawal
3. Discrete Mathematics by Dr. H.K.Pathak, & D.C. Agrawal – (shikha sahitya
prakashan)




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Ratankar


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BCA -102: STATISTICS - I

Max. Marks: 50

Min. Marks: 17

UNIT I

Variables & graphs: Statistics, population & sample, discrete & continuous variables, graphs, equations, inequalities, logarithms, Frequency distributions: frequency distributions, histogram, frequency polygons. Frequency curve, cumulative frequency distribution, ogives

UNIT II

Measures of central tendency : The arithmetic mean, weighted arithmetic mean, geometric mean, harmonic mean, mean power of numbers, root mean square, median, mode, quartiles, deciles & percentiles.

Measures of dispersion: The range, mean deviation, semi inter quartile range for quartiles, deviation, absolute & related dispersion, coefficient of variation.

UNIT III

Moments skewness & kurtosis: Moments of various types, relation between moments, sheppard's correction to moments, skewness & kurtosis, moment generating function.

Elementary probability theory: sample space, events, classical definition of probability, relative frequency definition, theorems of total & compound probability, Independent & dependent event, mutually exclusive event, mathematical expectation.

UNIT IV

Theoretical distributions discrete & continuous probability distribution. Basic concepts & applications of degenerate, Bernoulli, Binomial, geometric negative binomial. Hyper geometric & Poisson distributions, normal distribution

Curve fitting & the method of least squares: curve fitting the method of least square, the least square lines, the least square parabola, regression.

UNIT V

Correlation theory: Linear correlation, Measures of correlation, the least square regression lines expected & unexpected variation, coefficient of correlation, rank correlation, correlation index, multiple & partial correlation for three variables; Theory of attributes: Consistency of data, association of attributes, coefficient of association, contingency tables.

REFERENCE BOOKS :

1. Statistics schaum's outline series, Spiegel, M.R.McGraw Hill Publishing Company.
2. Mathematical statistics Kapoor & Saxena : - S,Chand & sons.

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BCA-103: PROGRAMMING & PROBLEM SOLVING THROUGH C -I

Max. Marks: 50

Min. Marks: 17

UNIT -I

Algorithm for problem solving: An Introduction, Properties of an algorithm, classification, algorithm logic, flowchart.

Program design and implementation issues: programming system design technique, programming technique, basic constructs of structured programming, modular designing of programs.

Programming Environment: High level programming language, Low level programming language, Middle level programming language, assembler, compiler, interpreter.

UNIT- II

Introduction to C, Historical development of C.

Getting started with C : The C Character set, Types of C Constants , Types of C Variables, C keywords, identifiers literals.

C Instructions : Type Declaration Instruction, arithmetic Integer, Long, Short, Signed, unsigned, storage classes, Integer and Float Conversions, type conversion in assignment, hierarchy of operations.

UNIT - III

Operators: Logical operators, hierarchy of logical operators, arithmetic operators, relational operators, assignment operators, increment and decrement operators, conditional operators, bit wise operators, special operators, "&,*,,>,"sizeof"

Decision Control Structures: control instructions in C, if, if-else, switch statement
Loops control structures : while loop, for loop, do - while loop, odd loop, nested loop, break , continue, goto, exit statement

UNIT -IV

Array: Introduction, array initialization, bound checking, 1D array, 2D array initialization of 1D and 2D array, memory map of 1D and 2D array, Multidimensional array.

Strings: Introduction, standard library string function strlen(), strcpy(), strcat(), strcmp(), 2D array of characters.

UNIT -V

Structure : Use of structure, declaration of structure, accessing structure elements, how structure elements are stored, array of structure, uses of structure

Preprocessor: features of C Preprocessor, macro expansion, macro with arguments, file inclusion, conditional, #if, #elif, miscellaneous directives, #include, #define, #undef, #pragma directives.

TEXT BOOK

Y. Kanetkar, "Let us C", BPB Publications

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REFERENCE BOOKS

1. Programming with problem solving thought 'C'. (ELSEVIER)(for UNIT I)
2. "Programming in C", E. Balaguruswamy Tata McGraw Hill
3. "C The Complete Reference", H. Schildt, Tata McGraw Hill
4. First course in programming with 'C', T.Jeyapooan (VIKAS)
5. The C Programming language by Brian W. Kernighan Dennis M. Ritchie
Prentice Hall
6. Practical C Programming 3rd Edition A Nutshell Handbook O'Relly.
7. Computer Programming and IT (for RTU), by Ashok N Kamthane et. al, Pearson
Education, 2011

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BCA – 107 Programming & Problem solving through C -I-LABORATORY

Max. Marks :25

Min. Marks : 09

List of practicals:

1. Write a C program to display "Hello Computer" on the screen.
2. Write a C program to display Your Name, Address and City in different lines.
3. Write a C program to find the area of a circle using the formula: $\text{Area} = \text{PI} * r^2$
4. Write a C program to find the area and volume of sphere. Formulas are: $\text{Area} = 4 * \text{PI} * R * R$ $\text{Volume} = 4/3 * \text{PI} * R * R * R$.
5. Write a C program to print the multiply value of two accepted numbers.
6. Write a C program to convert centigrade into Fahrenheit. Formula: $C = (F - 32) / 1.8$.
7. Write a C program to read in a three digit number produce following output (assuming that the input is 347)
3 hundreds 4 tens 7 units
8. Write a C program to read in two integers and display one as a percentage of the other. Typically your output should look like 20 is 50.00% of 40 assuming that the input numbers where 20 and 40. Display the percentage correct to 2 decimal places.
9. Write a C program to find out whether the character presses through the keyboard is a digit or not (using conditional operator).
10. Write a C program to swap variable values of i and j.
11. To sum n difference number using array.
12. To generates Fibonacci series.
13. Find the sum of series.
 - i) $1 + 2 + \dots$
 - ii) $2 + 4 + \dots$
 - iii) $1 + 3 + \dots$
 - iv) $1 + 2/2! + 3/3! + \dots$
 - v) $1 + x/1! + x^2/2! + x^3/3! + \dots$
 - vi) $1 - x/1! + x^2/2! - x^3/3! + \dots$
14. Find the factorial of given number using for loop
15. Find whether given year is leap or not.
16. Write a C program to find the maximum from given three nos.
17. Write a C program to find that the accepted no is Negative, Positive or Zero.
18. Write a program which reads two integer values. If the first is lesser print the message up. If the second is lesser, print the message down if they are equal, print the message equal if there is an error reading the data, print a message containing the word Error.
19. Write a C program that prints the given three integers in ascending order using if- else.
20. Given as input three integers representing a date as day, month, year, print the number day, month and year for the next day's date.
Typical input: "28 2 1992" Typical output: "Date following 28:02:1992 is 29:02:1992".
21. Write a C program for calculator designing using switch /case loop?
22. Write a C program to convert decimal to binary.
23. Write a C program to convert decimal to octal.
24. Write a C program to convert decimal to hexadecimal.
25. Write a C program to find the sum of first 100 natural nos.
26. Write a C program to find the sum of first 100 odd nos. and even nos.
27. Write a C program to display first 25 Fibonacci nos.
28. Write a C program to display first 100 prime nos.
29. Write a C program to find factorial of accepted nos.
30. Write a C program to find the sum of digits of accepted no.
31. Write a C program to print the accepted no and its reverse no.
32. Write a C program to print all the Factors of accepted no.

(Handwritten signatures and marks)
Rinitah
Sandy
Jais
Ashish
Vishal

33. Write a C program to find HCF of two given numbers.
 34. Write a C program to find all the prime number between two given numbers.
 35. Write C programs to print the terms of each of the following series:
 i. Sin(x) ii. Cos(x) iii. Log(1+x) iv. log(1-x) v. e^x vi. e^{-x}
 36. Write a C program to print the sum of series.(will be given in class)
 37. Display the following output on screen (assuming the value for input parameter n=5) :

a. * ** *** **** *****	b. 1 12 123 1234 12345	c. A AB ABC ABCD ABCDE	d. 1 23 345 4567 56789	e. 1 23 456 78910 101112131415
f. ***** **** *** ** *	g. ABCDE ABCD ABC AB A	h. * *** ***** *****	i. 1 123 12345 1234567 123456789	j. 1 1 121 12321 1234321 123454321
k. * ** *** **** *****	l. ABCDE ABCD ABC AB A	m. 1 12 123 1234 12345	n. ***** 0000 *** 00 *	o. 1 10 101 1010 10101
p. 1 01 101 0101 10101	q. 1 22 333 4444 55555	r. A AB ABC AB A	s. ABCDEDCBA ABCD DCBA ABC CBA AB BA A A	t. 1 121 12321 1234321 123454321

38. Write a C program to find minimum, maximum, sum and average of the given one dimensional array.
 39. Write a C program to perform the basic Matrix operations addition, subtraction, multiplication, Transpose.
 40. Write a program to take a sentence as input and reverse every word of the sentence.
 41. Write a program to find length of a string.
 42. Write a program that accepts two strings and concatenate them.
 43. Write a program to reverse a string entered by user.
 44. Accept a string and convert it to uppercase string.
 45. Write a program to count the number of words in a string.
 46. Write a program to count the vowels, consonants and other special characters in the input string.
 47. Write a program to take a sentence as input and reverse every word of the sentence.

NOTE:

- Every student will be given 6 period /week laboratory(1 period: 45 minutes)
- Every student will be work on independent computer (student: computer =1:1)

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 Anita
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BCA – 104: PC SOFTWARE

Maximum Marks: 50

Minimum Pass Marks: 17

UNIT I

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screen saver and appearance. Using windows accessories.

UNIT II

Documentation Using MS-Word - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT III

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation.

UNIT IV

Database Management using MS Access: Creating Database, Tables, primary key, Relationship, Forms and Reports, DBMS Queries.

UNIT V

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

TEXT BOOK

Learn Microsoft Office – Russell A. Shultz – BPB Publication

REFERENCES BOOKS

1. Microsoft Office – Complete Reference – BPB Publication
2. Courter, G Marquis. Microsoft Office 2000: Professional Edition. BPB.
3. PC Software – Shree Sai Prakashan, Meerut

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BCA- 108 PRACTICALS (PC SOFTWARE)

Max. Marks :25

Min. Marks : 09

Practical based on DOS: introduction to PCs with related Hardware, software, DOS its variations, and Starting DOS.

DOS Commands: internal External Commands, common Commands notation, files & file command, Disk Command, Batch files introduction to batch processing, creation of batch file special batch file, autoexec.bat hard disk setup, configuring a system, creation of subdirectories, pipelines, filter and miscellaneous.

WINDOWS

1. Creating folder, cut, copy, paste, managing file and folder in windows.
2. Arrange icons, set display properties
3. Adding and removing software and hardware
4. Setting date and time, screen saver and appearance.
5. Using windows accessories.
6. Settings of all control panel items
7. Search file
8. Windows – 2000 Desktop setting – new folder, rename, recycle bin operation, briefcase, control panel utility, Display properties, screen saver, background setting.

MS-Word

1. Creating & Editing Document
2. Formatting Document
3. Use of Auto-text, Autocorrect, Spelling and Grammar Tool,
4. Page Formatting, Page Border, Background,
5. Creation of MS-Word-Mail Merge, Macros, Tables.
6. Practice of Printing, page setup etc.

MS-Powerpoint

1. Creating, Manipulating & Enhancing Slides,
2. Inserting Organizational Charts, Excei Charts
3. Using Word Art
4. Putting Animations and Sounds
5. Inserting Animated Pictures
6. Inserting Recorded Sound Effect

MS-Excel

1. Creating & Editing Worksheet, Fill Handle
2. Use Formulas and Functions
3. Preparing Charts

MS-Access

1. Creating Database using template and blank database
2. Creating Tables using datasheet view and design view
3. Creating Relationship
4. Creating Query using query wizard and query design
5. Creating Reports
6. Creating Forms

NOTE:

1. Every student will be given 6 period /week laboratory(1 period: 45 minutes)
2. Every student will be work on independent computer (student: computer =1:1)

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BCA-105-DIGITAL COMPUTER ORGANIZATION

Max.Marks:50

Min.Marks:17

UNIT I

Block diagram of Computer, Stored program Concept, Word length and processing speed of the Computer, User interface, Hardware/Software Concepts, Microprocessor and Single chip microprocessor concepts.

Input and Output devices: Keyboard, mouse, joystick, scanner. Printers: printers and types of printers, plotters and display devices.

UNIT II

Number system and codes. Decimal, binary, octal, hexadecimal and their inter conversion. ASCII, grey code excess-3 code, BCD numbers, binary addition, subtraction, multiplication and division (1's and 2's compliment methods)

UNIT III

Logic gates: NOT, OR, AND, NAND, NOR, XOR, XNOR gates. Boolean Algebra, De Morgan's Theorem. Application of gates, half adder and full adder.

Boolean functions & truth table, Simplification of logical circuits using Boolean algebra, SOP, POS, and Karnaugh maps.

UNIT IV

Flip- Flop, Registers and counters, RS-flip flop, level clocked D,F/P edge triggered D flip flop , edge triggered JK flip flop , racing in F/F, JK masters-slave flip flop, buffer registers, shift registers, ripple counters, synchronous counters , ring counters, Mod Counters.

UNIT V

Computer Memory: memory cell, memory organization, Random Access Memory, Read Only Memory, PROM, EPROM, EEPROM, building large memories, magnetic hard disk, pen drive, Cache memory, optical disk.

Transfer of information between I/O devices, CPU and Memory.

TEXT BOOK

Digital Design by M. Morris Mano, Prentice Hall of India Pvt. Ltd.

REFERENCE BOOKS

1. Digital Computer Electronics by Malvino and Brown, McGraw Hill
2. Computer Fundamental Architecture and Organization by B. Ram
3. Computer Architecture and Organization by Nicholas Carter, Schaum Series TMH Adaptation.
4. Computer Organization by Hayes.
5. Computer Fundamentals by P. K. Sinha & Priti Sinha , BPB Publications.

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BCA – 106 : ENGLISH

Max. Marks : 50

Min. Marks : 17

Syllabus:

UNIT – I : Short- answer question.

UNIT – II : Reading Comprehensive and vocabulary.

UNIT – III : paragraph writing.

UNIT – IV : Letter Writing (both formal & informal)

UNIT – V : Grammar(20 Items from the prescribed text book to be asked and 15to be attempted)

Structural Items :

1. Simple. Compound and complex sentences

2. Co-ordinate clauses (with, but, or, either-or, neither-nor, otherwise or else)

i) Subordinate clauses-noun, clause-as, subject object and complement : Relative clauses (restrictive and non- restrictive clauses): adverb Clauses(open and Hypothetical conditional with because, thought, here, so that, as soon as)

ii) Comparative clauses (as+=adjective/adverb + as-no sooner.....Than)

Tenses :

i) Simple present, progressive present perfect

ii) Simple past, progressive and past perfect

iii) Indication of futurity The passive (Simple present and past, present and past perfect and to infinitive structure) reported speech : i) declarative sentences, ii) imperatives, iii) Interrogative-wh-question. Exclamatory sentences.

iv) Modals (Will, Shall, Should, Would, Ought to, have to/ have got to, Can-could, may-might and need) Verb structures (infinitives and gerundial), Linking Devices

NOTE : The above language items will be introduced to express the following communicative functions:

- Seeking and imparting information.
- Expressing attitudes- intellectual and emotional.
- Persuasion and dissuasion etc.

Questions on all the units shall be asked from the prescribed text which will comprise specimens of popular creative writing and the following items:

- Indian art Meaning of art Features of Indian art Elementary knowledge of paintings, music, dancing, Sculpture, Archaeology, Iconography and other social arts.
- Indian Literature ancient Indian Literature Elementary Knowledge of Vedic Literature, Mahabharat, Ramayan and other main Granthas.
- Indian freedom struggle. Freedom struggle of 1857 national consciousness, non-cooperation movement, Civil disobedient movement, contribution of revolutionaries in freedom struggle.
- Indian Constitution: Introduction, main futures of Constitution, fundamental rights, fundamental duties.

TEXT BOOK

English Language and Indian Culture: publication by M. P. Hindi Granth Academy

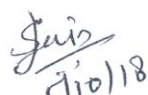











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SEMESTER – II



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BCA – 201: MATHEMATICS – II

Max. Marks : 50

Min. Marks : 17

UNIT – I

Curve Tracing : Tracing curves with equations in Cartesian & Polar forms.

Improper integrals : Convergence of improper integrals. Evaluation of Convergent improper integrals.

UNIT – II

Gamma and Beta function and their properties, some important deductions (duplication formula)

Rectification L length curve, intrinsic equation.

UNIT – III

Multiple integrals : Integration of functions of two & three variables, Double & triple integrals, Dirichlet integral use double & triple integral in finding areas and volumes.

Vector Integration : Indefinite and definite, surface and volume integrals, Gauss and Stokes theorems and some applications.

UNIT – IV

Partial Differential: Function of several variables, Limits, Continuity and Differentiability, Partial Derivatives, Euler's Theorem, Mean Theorem & Taylor's Theorem.

UNIT – V

Maxima & Minima function of two and three variables.

Convergence and Divergence of series: Definition and various tests.

TEXT BOOK

A text book of higher calculus for B.Sc II by Dr. H. S. Pathak & D.C. Agrawal . Shikha Sahitya Prakashan.

REFERENCE BOOK

A text book of higher calculus for B.Sc II by Dr. H. S. Sharma Ratan Prakashan.

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BCA – 202: STATISTICS – II

Max. Marks : 50

Min. Marks : 17

UNIT- I

Estimation Theory : Unbiasedness, Consistency, efficiency and sufficiency of estimations, Maximum likelihood estimates and their properties (without proof), Cramer Rao Inequality and Minimum variance estimates.

UNIT- II

Testing of Hypotheses : Simple and composite hypothesis, error of kind-I and kind – II, critical region, level of significance, size and power of a test, Neymann Pearson's fundamental lemma and its application(with Proof)

UNIT – III

Test of significance: Test of simple hypothesis, Beta, gamma distributions and properties, Chi-square, T, F, Z distribution and test based on them.

UNIT – IV

Non- parametric Test : Sign test, Median test, Wilcoxon's run test, Wilcoxon's signed rank test. Contingency tables.

UNIT- V

Analysis of Variance : one –way & Two – way classification with one observation per cell, basic designs of experiments : completely randomized design, randomized block design & latin square design.


TEXT BOOK

Mathematical Statistics by J. N. Kapoor & H.C. Saxena , S. Chand & co.

REFERENCE BOOKS:

1. Fundamental of Statistics Vol. 1 M. Goon, B. Dasgupta, M.K. Gupta, The World Press Pvt. Ltd.




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BCA -203: PROBLEM SOLVING AND PROGRAMMING THROUGH C -II

Max. Marks: 50

Min. Marks: 17

UNIT - I

Functions: definition, declaration, calling & use. passing values b/w function, scope rule of function.

Advanced feature of functions: Function declaration & prototypes, call by value, call by reference, back to function calls, macro verses function, Recursion, need of recursion, types of recursion.

UNIT- II

Pointer: Definition & declaration, pointer assignment, pointer & arrays, passing entire array to function, pointers & 2D array, pointers array, pointer to array, array of pointer to string, Pointer to structures, uses of pointers, malloc(), calloc(), realloc(), free() library function.

Union: Union definition & declaration, accessing a union member, union of structures, initialization of union member, uses of union, use of user defined data types

UNIT-III

Types of I/O, Console I/O function, Formatted console I/O function, printf(), scanf(), unformatted console I/O functions.

Disk I/O function: File opening modes, reading and writing, closing files., String I/O in files, formatted disk I/O function, text verses binary mode, record I/O in files, detecting error in reading & writing, Command line arguments.

UNIT-IV

Components of VDU: Display Adapters, Display Screens (monitor), Video Display modes, resolution

Text or Graphics: Color in text in modes, color in graphic mode, video pages, writing to VDU memory in text mode.

UNIT-V

Graphic programming: lines, stylish lines, drawing & filling images, patterns with differences, bar()

Filling regular & non-regular shapes, palettes & colors, outputting text, justifying text, animation basics.

TEXT BOOK:

Let Us 'C' by Y. Kanetkar , BPB Publication.

REFERENCE BOOKS:

1. Programming in 'C' Balaguruswami.
2. First course in Programming with 'C' by T. Jeyapooan(VIKAS)
3. The C programming Language by Brain W. Kernigham and Dennis M. Ritchie
4. Practical C programming, 3rd edition(anetshell handbook)O'Reilly
5. Computer Programming and IT (for RTU) by Ashok N Kamthane et. al, Pearson Education, 2011

**BCA -207 PRACTICAL
PROGRAMMING & PROBLEM SOLVING THROUGH C -II**

MAX.MARKS:25

MIN. MARKS: 09

List of Practical's:

List of Practical

1. Write program to find square root of a number without using built in function
2. To find factorial of a no. using recursion
3. To reverse digit of number
4. To reverse the given string
5. Write a C Function for the following task
 - a. Calculating Factorial
 - b. Find value of a given Fibonacci term
 - c. Swapping the values of two variable
 - d. Minimum/maximum value from the given input
6. Write User Defined Function and test them in the main program for the following standard functions
 - a. int myatoi(Char *s)
 - b. char *myitoa(int i)
 - c. int mystrlen(char *s)
 - d. char *mysubstr(char *s, int i, int j)
 - e. char *mystrcat(char *s1, char *s2)
 - f. int mystrcmp(char *s1, char *s2)
 - g. int mystrchr(char *s, char c, int i)
 - h. char *mystrrev(char *s)
 - i. int mystrend(char *s, char *t)
 - j. char *myreplace(char *s, char *old, char *new)
 - k. int abs(int i)
 - l. char *mytoupper(char *)
 - m. char *mytolower(char*)
 - n. int isupper(char *s)
 - o. int islower(char *s)
 - p. int mypower(int a, int b)
7. Write a program which ask date of birth in dd/mm/yy format and spell it in word.
8. To find out twins prime number.
9. To enter a four digit number and print it in all combination.
10. Write a program to remove duplicate elements in an array.
11. Write a program to sort the names in an array.
12. Write the following recursive C Function
 - a. Factorial of a given number
 - b. Nth Fibonacci number
 - c. Reverse of a given String
 - d. Reverse of a give Number
 - e. Sin(x)
13. Write a program that creates a record having five fields and create a structure array. Accept the records of the students. Accept a name of student and search it. Print the details if the record is found else print error message.
14. Write a C program to exchange the value of two variable using function.
15. Write a program to add two number using pointer
16. Write a program to create a file and write data into it.
17. Write a program to open an existing file, read data from it and display it on the screen.

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18. Write a C program to create a file of integers and write data into the file. Open the file, read numbers from it and write even and odd numbers to separate file.
19. Write a program to append contents into an existing file.
20. Write a program that merges the contents of two file and write it in the third file.
21. Write a program that copies the contents from one file to another.
22. Write a program to read character from one text file convert into upper case and write into other file.
23. Write a C program that creates an Employee text file. The fields of the records are empid, empname, designation, qualification, salary, experience, no. of papers published, address, city, and phone no. The program must implement the operation to modify a record, delete a record and append new records.
24. Write a payroll program using file handling
25. Write a mark sheet program using file handling
26. Write C programs for the following operation to work like DOS Commands (use command line arguments):
 - a. type abc.txt
 - b. copy source1.txt source2.txt
 - c. copy source1.txt source2.txt source3.txt source4.txt
 - d. compare source1.txt source2.txt
 - e. concat source1.txt source2.txt
27. Write a C program to open two files containing integers (in sorted order) and merge their contents.
28. Write a C program to count the number of vowels, consonants, digits, spaces, other symbols, words and lines in a given text file.
29. Write C code to check if an integer is a power of 2 or not
30. Write a C program to count bits set in an integer.
31. Write a C program to set a particular bit in a given number.
32. Write a C program to reset a particular bit in a given number.
33. Write a program to display rainbow.
34. Write a C program to implement moving car.
35. Write a program that displays a bouncing ball.
36. Write a program that displays a rotating fan.

NOTE:

1. Every student will be given 6 period /week laboratory (1 period: 45 minutes)
2. Every student will be work on independent computer (student: computer =1:1)

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Somali

Arjun
Ashish
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BCA 204: INTRODUCTION TO INFORMATION SYSTEM

Max. Marks: 50

Min. Marks: 17.

UNIT I: Introduction to Information System: Definition, Meaning of Information System, System Concept, Need to learn Information System, Competitive advantage, Careers in Information System. Fundamentals of Data Processing, Components of Computer system, Applications of Computer Based System.

UNIT II: A System Approach to Problem Solving: The Scientific Method, The System Approach, Understanding a Problem or opportunity, Developing & Implementing a solution, A System Solution Methodology, Applying the Solution Methodology. Types of Information Processing System: Overview of six major types of systems - Transaction Processing System, Office Automation System, Knowledge Work Systems, Management Information System, Decision Support Systems and Executive Support System.

UNIT III: System Concepts and The Information Systems Environment: The System Concept: Definition, Characteristics of a System, Central Objective, Element of a system, Types of Systems, The Systems Development Life Cycle: Recognition of Need, Feasibility Study, Analysis, Design, Implementation and The Role of System Analyst.

UNIT IV: The Meaning and use of MIS system in view of Business, Process of MIS, System Design: System Design Consideration, input/output design, forms design, file organization and database, data management, file design.

UNIT V: E –Commerce: Introduction to E-Commerce, types of E-commerce, E-Commerce Applications, electronic payment systems. Overview of Communication System, Use and functioning of the internet, WWW, Digital Marketing, Search Engine Optimization.

Text Books

1. Ralph Stair , “Principle of Information System”, Thomson course technology.
2. Elias M. Awad, “System Analysis and Design”, Galgotia Publishing Pvt. Ltd., New Delhi.

Reference Books

1. James A Senn, “Analysis and Design of Information Systems”, McGraw-Hill Publishing Company, Delhi.
2. Muneesh Kumar, “Business Information Systems”, Vikas Publishing House Pvt. Ltd., New Delhi.
3. James A. O’Brien, “Management Information System”, Galgotia Publications Pvt. Ltd. New Delhi.
4. Kenneth C. Laudon & Jane P. Laudon, “Management Information System”, Prentice Hall of India Ltd., New Delhi

BCA 208: PRACTICAL
INTRODUCTION TO INFORMATION SYSTEM

Max. Marks: 25

Min. Marks: 09

1. Exposure to Internet, Web Browser, Search engines and Search Engine Marketing, Digital Marketing.
2. Email creation, email writing ethics, campaign creation and management.
3. Key Word Analysis and Web Page ranking.
4. Understanding and creating Google form, Google Adword and Adword Analytics.
5. Search Engine Optimization.
6. Exposure to Social Media, Social Media Mining, Marketing through Face book.
7. YouTube including creating a channel on YouTube.
8. Social Media Measuring, Monitoring, Reporting, Tracking and Monitoring platforms.
9. Creating and Using Blog.
10. Use of Blogs for Forum and discussion.

Reference Books

1. Raghvendra K., Shruthi Prabhakar, "**Digital Marketing**", Himalaya Publishing House, Mumbai.

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BCA-205: OPERATING SYSTEM FUNDAMENTALS

Max.Marks:50

Min.Marks:17

UNIT I

Introduction to Operating Systems, Operating system services, multiprogramming, time sharing system, storage structures, system calls, multiprocessor system, Device Management, Device Drivers.

UNIT II

Process concept, Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling I/O devices organization, I/O buffering.

UNIT III

Inter-process communication, precedence graphs, critical section problem, semaphores, Classical problems of synchronization.

UNIT IV

Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.

UNIT V

Concepts of memory management, logical and physical address space, swapping, contiguous and non-contiguous allocation, Concepts of virtual memory, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation.

TEXT BOOK

1. Operating System Concepts, Addison Wesley, 4th Edition, A. Silberschatz and P. Galvin. Latest Edition.

REFERENCE BOOK:

1. Operating System by Deitel
2. Operating systems, 4th Edition, William Stallings, Pearson Education, 2003.

BCA-206: HINDI LANGUAGE

Max. Marks: 50

Min. Marks: 17

ईकाई 1

- क मानक हिन्दी भाषा:
1. मानक हिन्दी के लक्षण और उदाहरण, 2. मानक हिन्दी का स्वरूप 3. मानक हिन्दी के प्रकार
ख अशुद्धियों और उनका संशोधन:
1. अशुद्धियों के उदाहरण, 2. अशुद्धियों के प्रकार (उच्चारण गत, वर्तनी गत, शब्द और अर्थ गत, व्याकरण गत)

ईकाई 2

- क हिन्दी का शब्द भंडार:
1. शब्दों के प्रकार, 2. शब्दों की रचना, 3. नये प्रयोग
ख हिन्दी की वाक्य रचना:
4. वाक्यों के प्रकार, 5. वाक्य विन्यास, 6. वाक्य गत सामान्य अशुद्धियाँ, 7. विराम चिन्ह

ईकाई 3

- पत्र लेखन, सार लेखन, पल्लवन:
1. पत्रों के उदाहरण, 2. पत्रों के प्रकार, 3. पत्र लेखन की विशेषताएं (पत्र लेखन, संबोधन, अंत में दिनांक आदि डालना), 4. सार लेखन, 5. पल्लवन

ईकाई 4

- भारतीय संस्कृति, भारत देश और उसके निवासी, भारतीय समाज की संरचना, सामाजिक गतिशीलता – अद्यतन, कार्य और दर्शन

ईकाई 5

- भारतीय संस्कृति, का विश्व पर प्रभाव, मध्य प्रदेश का सांस्कृतिक वैभव

पाठ्यपुस्तक: भारतीयता के अमर स्वर, प्रकाशन: म.प्र. हिन्दी ग्रंथ अकादमी, भोपाल।

अनुक्रमणिका

खण्ड एक: पाठ्य सामग्री

ईकाई 1	1 भारत वंदना 2 स्वतन्त्रता एकारती 3 बड़े घर की बेटी	सूर्यकान्त त्रिपाठी भनिराला जयशंकर भप्रसाद प्रेमचन्द
ईकाई 2	4. एक गधे की वापसी 5 टेलीफोन 6 अफसर	कृष्णचन्द्र हरीशंकर परसाई शरद जोशी
ईकाई 3	7 सौन्दर्य की नदी नर्मदा 8 बस्तर में बाघ	अमृतलाल बेगड़े शानी
ईकाई 4	9 बुद्ध की करुणा 10 सादगी	डॉ सिद्ध तिरस महात्मा गांधी
ईकाई 5	11 योग की शक्ति 12 शिकागो से स्वामी विवेकानन्द का पत्र	हरिवंशराय भबचन

खण्ड दो: हिन्दी भाषाय सम्प्रेषण कौशल

- ईकाई 1 क. मानक हिन्दी भाषा
ख. अशुद्धियों और उनका संशोधन
ईकाई 2 क. हिन्दी का शब्द भंडार
ख. हिन्दी की वाक्य रचना और विराम चिन्ह
ईकाई 3 क. पत्र लेखन, सार लेखन, पल्लवन

खण्ड तीन: भारतीय संस्कृति

- ईकाई 4 क. भारत देश और उसके निवासी
ख. भारतीय समाज की संरचना
ग. सामाजिक गतिशीलता
घ. धर्म और दर्शन
ईकाई 5 क. भारतीय संस्कृति का विश्व पर प्रभाव
ख. मध्य प्रदेश का सांस्कृतिक वैभव

DEVI AHILYA VISWAVIDYALAYA, INDORE, (M. P.)



SEMESTER WISE SCHEME
AND
SYLLABUS

FOR

BACHELOR OF COMPUTER APPLICATIONS (B. C. A.)

2018-19 ACADEMIC YEAR ONWARDS

Dr. [Signature]
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BCA Third Year Semester Scheme: 2018-19 and Onwards

BCA – V Semester Examination Scheme

Course	Theory Max. Marks		Practical Max Marks	Max. Marks	Min Marks
	Internal	External			
BCA – 501 Linear Algebra and Geometry	10	40	-----	50	04+13
BCA – 502 Computer Networks	10	40	-----	50	04+13
BCA – 503 Introduction to Cloud Computing	-----	50	-----	50	17
BCA – 504 Introduction to Data Science	-----	50	-----	50	17
BCA – 505 Human Values and Professional Ethics	10	40	-----	50	04+13
BCA – 506 Information Technology Trends	10	40	-----	50	04+13
BCA – 507 Network and Cloud Computing Lab	-----	-----	25	25	09
BCA – 508 Practical on Data Science using R	-----	-----	25	25	09
Total Marks	40	260	50	-----	-----
Grand Total	-----	-----	-----	350	-----

Note: The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/ analytical/ theoretical questions.

**BCA – VI Semester
Examination Scheme**

Course	Theory Max. Marks		Practical Max Marks	Max. Marks	Min Marks
	Internal	External			
BCA – 601 Operations Research	10	40	-----	50	17
BCA – 602 Internet and Web Technology using PHP	-----	50	-----	50	17
BCA – 603 Computer Graphics and Multimedia	-----	50	-----	50	17
BCA – 604 Principal ^{les} and Practices of Management	10	40	-----	50	04+13
BCA – 605 Project	40	60	-----	100	33
BCA – 606 Computer Graphics and Multimedia LAB	----	----	25	25	09
BCA – 607 Practical on Internet and Web Technology using PHP	-----	-----	25	25	09
Total Marks	60	240	50	-----	-----
Grand Total	-----	-----	-----	350	-----

Note: The examiner shall set one question from each unit. Each question will have three sub parts. The students will attempt any two sub-parts of a question. All questions carry equal marks. The question paper will be a balanced combination of numerical/ conceptual/ analytical/ theoretical questions.

BCA – 501: Linear Algebra and Geometry

Max. Marks: 40

Min Marks: 13

Course Objectives: To introduce the concept of Linear Algebra & Geometry which build strong foundation of students in many areas of Computer Science including graphics, image processing, Cryptography, machine learning, computer vision, Optimization, graph algorithm, quantum computation, information retrieval and web-search. Analytical Geometry is very important for computer graphics, computer games, game designing, animation and cartography.

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Vector Space and Linear Maps which help in the image processing.
- 2) Concept of Eigen Vectors and Eigen Values and that have many important applications in computer vision and machine learning.
- 3) Group Theory which plays a vital role in applications of Cryptography.
- 4) Parabolic and ellipsoidal surfaces which helps in computer graphics.
- 5) Cone and cylindrical surfaces which helps in cartography and animation.

Unit I

Groups. Definition, Order of an element. Subgroups; Definition, Necessary and Sufficient Condition. Coset Decomposition. Right and Left Cosets, Lagrange's Theorem. Definitions and Basics of Normal Subgroups, Quotient Group, Homomorphism and Isomorphism of groups, Kernel of Homomorphism.

Unit II

Vector Spaces. Vector space, Subspace and Quotient Space, Linearly Dependent and Independent Vectors. Linear Maps. Definition and properties. Homomorphism and Isomorphism of Vector spaces, Kernel of a Linear Map.

Unit III

Matrix Representation of a Linear Map. Rank and Nullity of Linear Map. Fundamental Theorem of Vector Space Homomorphism. Eigen Values and Eigen vector of Matrix, Cayley Hamilton Theorem: Proof and Applications.

Unit IV

Parabolic, definition and description, Elliptical and Hyperbolic paraboloid, Parabolic of revolution. Tangent planes and Normal to a parabolic. The Ellipsoid, Tangent & Normal plane to it, director sphere of an ellipsoid, conjugate diameters and diametrical planes to ellipsoid. locus of chords.

Unit V

The definition and description, finding equation of Cone, standard equation, condition of general Quadratic equation representing cone. Angle between two generators enveloping

Cone of conicoid, right circular Cone. The Cylinder definition, equation, right circular Cylinder, enveloping cylinder to a conicoid.

Text Books:

- (1) Linear Algebra by I. N Herstein, Wiley Publisher.
- (2) Analytical Geometry of Three Dimensions by P. K. Jain, New Age International Publisher.

Reference Books:

- (1) Linear Algebra Schaum's Series by Seymour Lipschutz & Mark Lipson, Mc-Graw Hill Publisher.
- (2) Linear Algebra by S. N. Goel, Kedarnath Ramnath Publication, Meerut.
- (3) Linear Algebra by Kenneth Hoffman and Ray Kunze, Prentice Hall of India Pvt. Ltd. New Delhi.
- (4) Solid Geometry by M.L. Khanna, S.P Nigam, S.S. Gangwar, Jai Prakash Nath Publication Meerut.
- (5) Solid Geometry by P.N. Chatterjee, Ram-Prasad & Sons Publisher Bhopal.
- (6) Coordinate Geometry of Three Dimensions by D.C Agrawal Shree Sai Prakashan Meerut .

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BCA – 502: Computer Networks

Max. Marks: 40

Min Marks: 13

Course Objectives: The course objective is to provides a general idea of data communications, networking, protocols, standards and networking model.

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Independently understand basic computer network technology.
- 2) Understand and explain Data Communications System and its components.
- 3) Identify the different types of network topologies and protocols.
- 4) Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- 5) Identify the different types of network devices and their functions within a network.
- 6) Understand and building the skills of subnetting and routing mechanisms.
- 7) Get familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Unit I

Data communications and networking for Today's Enterprise, A communication model, Data Communications, Networking, and the Internet. Network model, need for a protocol architecture, The TCP/IP protocol architecture, The OSI model, Addressing. Data transmission: Concept and terminology, Analog and digital signals, Transmission impairment, Channel capacity.

Unit II

Digital transmission: Digital-to-digital conversion, Analog-to-digital conversion, Transmission mode. Analog transmission, Digital-to-analog conversion, Analog-to-digital conversion.

Unit III

Bandwidth utilization: Frequency division multiplexing, Wavelength division multiplexing, Synchronous and statistical time-division multiplexing, switching: Circuit switching Packet switching, Types of errors, framing (character and bit stuffing), error detection & correction method.

Unit IV

Data Link Layer protocols, LAN Protocol Architecture, Bridges, Emergence of High — Speed LANs, Ethernet, Token Bus, Token Ring, Wireless LAN Technology (Wi-Fi). Routing in switched network: Routing in packet switched networks,

Unit V

Internet and transport protocols: Principles of internetworking IPv4 & IPv6, Connection-oriented transport protocol mechanism, TCP and UDP. Network security: Encryption and decryption technique. Internet applications: E-mail, World Wide Web, And HTTP.

Text Books:

- (1) Data Communications and Networking, Behrouz A. Forouzan, McGraw-Hill, 4th Ed.,
- (2) A. S. Tanenbaum – “Computer Networks (4th Ed.)” – Pearson Education/PHI

Reference Books:

- 1) Computer Networking: James F. Kurose & Keith W. Rose, Pearson Education, Third Edition, 2005.
- 2) Communication Networks: Fundamentals Concepts and Key Architecture : Albert Leon-Garcia and Indra Widjaja, , Tata McGraw-Hill Publishing Company Limited, ISBN 0-07-0402235-3.
- 3) Data and Network Communication: Michael A. Miller, Delmar Thomson Learning inc ISBN 0-07668-1100-X.
- 4) Introduction to Computer Networks: Douglas E. Comer, Prentice-Hall. Alberto Leon-Garcia and Indra Widjaja, Communication Networks –Fundamentals
- 5) Concepts and Key Architecture, ~~Tata McGraw-Hill~~ Publishing Company Limited, ISBN

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CS – 503: Introduction to Cloud Computing

Max. Marks: 50

Min Marks: 17

Course Objectives: The course objective is to provide comprehensive knowledge of the Cloud Computing fundamental issues, technologies, applications and implementations including security aspects.

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Understand the core issues of cloud computing such as security, privacy, and interoperability.
- 2) Identify problems, and explain, analyze, and evaluate various cloud computing solutions.

Unit I

Introduction to cloud computing, History, Importance of cloud computing in the current era, characteristics of cloud computing, what cloud computing really is and isn't, pros and cons of cloud computing, technologies in cloud computing, migrating into cloud.

Unit II

Types of clouds, cloud infrastructure, cloud application architecture, working of cloud computing, trends in cloud computing, cloud service models, cloud deployment models, cloud computing and services pros and cons.

Unit III

Cloud computing technology, cloud life cycle model, role of cloud modelling and architecture, cloud system architecture, virtualization, types of virtualization, importance and limitations of various types of virtualization, virtualization in cloud computing.

Unit IV

Data storage, introduction to enterprise data storage, data storage management, file system, cloud data stores, cloud storage characteristics, applications utilizing cloud storage.

Unit V

Introduction to web services, cloud service deployment tools, management/ administrative services, risk management in cloud computing, introduction to apache hadoop.

Text Books:

- (1) Cloud Computing: A practical approach for learning and implementation, 1st edition, Pearson, A. Srinivasan, J. Suresh.

Reference Books:

- 1) Cloud Computing Bible. Barrie Sosinsky, Wiley-India, 2010
- 2) Cloud Computing: Principles and Paradigms. Editors: Rajkumar Buyya, James Taylor, and John P. Coxson. Wiley, 2011

- 3) Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012
- 4) Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley-India, 2010

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CS – 504: Introduction to Data Science

Max. Marks: 50

Min Marks: 17

Course Objectives: The objective of the course is introducing and teach idea of Data Science and enable students to apply Data Science in real world. This course will help learning from data, in order to gain useful predictions and business decisions.

Learning Outcomes: It is expected that after completion of the course, students will able to

- 1) Learn the fundamentals of Data Science
- 2) Work with R to analyze structured and unstructured data.
- 3) Develop the ability to build and assess data-based models.
- 4) Predict outcomes with supervised and unsupervised machine learning techniques.

Unit I

Introduction: What is Data Science? The Data Science Process, Different Types of Data: Quantitative, Categorical. Graphical Summaries of Data: Pie Chart, Bar Graph, Pareto Chart, Histogram. Measuring the Center of Quantitative Data: Mean, Median, Mode. Measuring the Variability of Quantitative Data: Range, Standard Deviation, and Variance.

Unit II

Overview of R, R data types: Vectors, Matrices, Factors, Lists, Data Frames, reading and writing data, Control structures, functions, scoping rules, dates and times

Unit III

Introduction to Data Cleansing, Missing and Repeated Values, Feature Engineering, Outliers and Errors, Finding Outliers, Cleaning Data with R.

Unit IV

Machine Learning: Definition and overview, Regression, Simple Linear Regression, Multiple Regression, Assessing Performance, Ridge Regression, Feature Selection & Lasso, Nearest Neighbors & Kernel Regression

Unit V

Machine Learning: Classification, Linear Classifiers & Logistic Regression, Learning Linear Classifiers, Overfitting & Regularization in Logistic Regression, Decision Trees, Handling Missing Data, Boosting.

Text Books:

- 1) Allan G. Bluman, Elementary Statistics: A Step By Step Approach, 10th Edition, McGraw-Hill, 2017.
- 2) Paul Teator, R Cookbook, First Edition, O.ReillyMedia, 2011.
- 3) Tom Mitchell, Machine Learning, First Edition, McGraw Hill, 1997

BCA – 505: Human Values and Professional Ethics

Max. Marks: 40

Min Marks: 13

Course Objectives: The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of “right” and “virtuous” in individual, social and professional context.

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Understand ethical philosophies, principles, models that directly and indirectly affect business.
- 2) Learn the importance of the ethics and moral values.

Unit I

Human Values; Types, Features and Classification Sources of Value System Values across Cultures.

Unit II

Morality Norms, Beliefs, Attitude Moral Norms, Moral Values Moral Standards

Unit III

Professional Ethics; Nature, Characteristics and Needs Ethics V/s Morals and Values Ethico-Moral Action Ethical Codes, Ethical Practices

Unit IV

Nature and Dimensions of Attitude Components of Attitude Attitude Formation Functions of Attitude Changing Attitude

Unit V

Moral Values and Character-Building Character; Meaning, Important Components of Character Character Development.

Text Books:

- 1) Beteille Andre (1991), Society and Politics in India, Athlone Press, Latest edition
- 2) Chakraborty S. K. (1999), Values and Ethics for Organizations, oxford university press, Latest edition
- 3) Fernando, A.C. (2009), Business Ethics - An Indian Perspective, Pearson Education, India, Latest edition

Reference Books:

- 1) Charles D. Fleddermann (2012), "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, (Indian Reprint), Latest edition
- 2) Boatright John R (2012), "Ethics and the Conduct of Business", Pearson Education, New Delhi, Latest edition
- 3) Crane, Andrew and Matten Dirk (2015), Business ethics, Oxford University Press Inc., New York., Latest edition

- 4) Murthy, C.S.V. (2016), Business Ethics – Text and Cases, Himalaya Publishing House Pvt. Ltd., Latest Edition
- 5) Naagrajan,R.R (2016), Professional Ethics and Human Values, New Age International Publications, , Latest edition
- 6) Campbell, V., & Bond, R. (1982). Evaluation of a character education curriculum. In D. McClelland, Education for values. New York: Irvington Publishers, Latest Edition.
- 7) R. S. Dwivedi (1995), “Human Relations and Organizational Behavior: A Global perspective”, Macmillan Latest Edition

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CS – 506: Information Technology Trends

Max. Marks: 40

Min Marks: 13

Course Objectives: To make aware student the changes in technologies, applications and systems around us.

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Get knowledge about modern communication systems.
- 2) Be familiarized with concept of Mobile Commerce and Geographic Information System.
- 3) Understand the concept of data warehouse, data mining and Big Data.
- 4) Understand the use of Artificial Intelligence and IoT in current context.

Unit I

Introduction and basic concepts of modern communication and telephony technology: CDMA, WLL, GSM, VOIP, Bluetooth, Wi-Fi, Communication Technology: 2G, 3G, 4G, 5G. Communication over Radio, Microwave systems, Communication satellites, Radar, Fiber optics, ISDN – their properties, Geographic Information System (GIS): Components of a GIS – Hardware, Software, Data, People, Methods, Working and application of GIS.

Unit II

Information Security - Introduction, Malicious Programs, Cryptography, Digital Signature, Firewall, Users Identification and Authentication, Security Awareness and policies, Application areas requiring security. Mobile Commerce: Introduction, Growth, Success stories of Mobile commerce, Technologies for mobile commerce, M-Commerce in India. Digital Marketing

Unit III

Data Warehouse and Data Marts: Introduction, Advantages of data warehouse, Data warehouse components, Data warehouse architecture and schemas. Big Data Concept, Data Mining: Introduction, Evolution of data mining, Data mining – verification versus discovery, Advantages of data mining, Technologies used in data mining.

Unit IV

Artificial Intelligence and Expert System: Concept of Artificial Intelligence and Expert System, Building of Expert System, Merits and Demerits of Expert System, Application of Expert System, Application of Artificial Intelligence

Unit V

Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT. Logical design of IoT, Functional blocks of IoT, Home automation, Industry applications, Surveillance and other IoT applications. Introduction to Virtual Reality: definition, Applications of VR. Smart Systems, Embedded systems,

Text Books:

- 1) Fundamentals of Information Technology by Alex Leon & M. Leon, Vikas Publications, New Delhi.
- 2) Frontiers of Electronic Commerce by Ravi Kalakota, Andrew B. Whinston, , Addison Wesley Longman Publication.
- 3) E-Commerce: An Indian Perspective (Second Edition) by S.J.P. T. Joseph, Prentice-hall Of India Pvt Ltd.
- 4) Security in Computing (Third Edition) by C.P.Pfleeger, S.L. Pfleeger, D.N. Shah, S.Ware, Prentice Hall 2002.
- 5) Mobile Communications, Joschen Schiller, Pearson Education.
- 6) Recent Magazines of Computers and Communication.
- 7) Cloud Computing PHI by Rao M.N.
- 8) Internet of Things McGrawHill by Raj Kamal

Reference Books:

- 1) Introduction to Information Technology - ITL Education Solutions Ltd., Seventh Impression, Pearson Education, 2008.
- 2) Data Mining Techniques - Arun K Pujari, University Press.
- 3) Enterprise Resource Planning 1/e - Alexis Leon, International edition-Tata McGraw Hill publication.
- 4) Concepts in computing - Kenneth Hoganson, First Indian Edition, Jones & Bartlett Publishers, Inc., 2010.
- 5) Artificial Intelligence - Elaine Rich, Kevin Knight, 2nd edition, McGraw Hill, 1991.
- 6) Computer Networks - Andrew S. Tanenbaum, 4th Edition, Pearson Education.

BCA – 507: Network and Cloud Computing Lab

Max. Marks: 25

Min Marks: 9

- 1) Familiarization with Networking Components and devices: LAN Adapters, Hubs, Switches, Routers etc.
- 2) Familiarization with Transmission media and Tools: Co-axial cable, UTP Cable, Connectors etc., Preparing straight and cross cables.
- 3) Study of various LAN topologies and their creation using network devices, cables and computers.
- 4) How to make a network cabling connection.
- 5) How to Create a Local Area Network (LAN).
- 6) Network Protocol - Types of Network Protocols.
- 7) Network maintenance Troubleshooting.
- 8) Steps for installing Proxy Server on Windows.
- 9) Procedure to create a network (LAN).
- 10) Trouble shooting tools in Data Communication.
- 11) Procedure to share hardware resources (printer) over network.
- 12) Implementation of file and printer sharing.
- 13) Network Cable Connectors Types and Specifications.
- 14) Case study on IEEE Standards 802.3, 802.4 and 802.5.
- 15) Case Study on DNS, TELNET, FTP
- 16) Virtualization in cloud using any freeware Tool.
- 17) Installing Operating System on virtual computer.
- 18) Using existing cloud services like SAAS, PAAS, IAAS, Cloud Storage.

BCA – 508: Practical on Data Science using R

Max. Marks: 25

Min Marks: 9

- 1) Write a R program to take input from the user (name and age) and display the values. Also print the version of R installation.
- 2) Write a R program to get the details of the objects in memory.
- 3) Write a R program to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.
- 4) Write a R program to create a vector which contains 10 random integer values between -50 and +50.
- 5) Write a R program to get the first 10 Fibonacci numbers.
- 6) Load the built in warpbreaks data set . Find out, in a single command, which columns of warpbreaks are either numeric or integer.
- 7)
 - a. Load the `state` datasets.
 - b. Convert the `state.x77` dataset to a dataframe.
 - c. Rename the `Life Exp` variable to `Life.Exp`, and `HS Grad` to `HS.Grad`
- 8) Suppose we wanted to enter all the variables in a first-order linear regression model with Life Expectancy as the dependent variable. Fit this model.
- 9) Suppose we wanted to remove the `Income`, `Illiteracy`, and `Area` variables from the model in Exercise 2. Use the `update` function to fit this model.
- 10) Let's assume that we have settled on a model that has `HS.Grad` and `Murder` as predictors. Fit this model.
- 11) Write a R program to create a Data Frames which contain details of 5 employees and display summary of the data
- 12) Write a R program to create the system's idea of the current date with and without time.
- 13) To prepare data for analysis in R
- 14) To find missing data in R?
- 15) To exclude missing data in R?
- 16) To remove rows with 0 in R?
- 17) Create a list of 80% of the rows in the original dataset to use for training.
- 18) Select 20% of the data for validation.
- 19) Use the remaining 80% of data to train and test the models.
- 20) Find the dimensions of the "iris" dataset.
- 21) Find the type of each attribute in your dataset.
- 22) Take a look at the first 5 rows of your dataset.
- 23) Display the summary of the "iris" dataset.
- 24) What happens to missing values in a histogram? What happens to missing values in a bar chart? Why is there a difference?

BCA – 601: Operations Research

Max. Marks: 40

Min Marks: 13

Course Objectives: To analyze different situations in the industrial/ business scenario involving limited resources and finding the optimal solution within constraints.

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Identify and develop operational research models from the verbal description of the real system.
- 2) Analyze the different operation research models that are needed to solve optimization problems.
- 3) Understand the mathematical tools that are needed to solve business problems.
- 4) Formulate and solve the problems as networks and graphs.
- 5) Use CPM and PERT techniques to plan, schedule and control project activities.
- 6) Apply analytical skills and problem-solving tools to the analysis of the operations problems.

Unit I

Introduction to Operations Research: Origin and Development of OR, nature of OR, characteristics of OR, Meaning, Scope of Operations Research and Decision making, Advantages and Limitations of OR, Application of OR, Phases of OR, OR Models.

Unit II

Linear Programming: Meaning of Linear Programming, Mathematical Formulation of Linear Programming Problems, Graphical Solution, Simplex Method, Dual Simplex, Advantages and limitations of LPP.

Unit III

Transportation Problems: Mathematical Model and Formulation, Initial Basic Feasible Solution, North West Corner Method, Least Cost Method, Vogel's Approximation Method, Optimal Solution (Minimization And Maximization) using Modified Distribution Method, Degeneracy in Transportation Problem.

Unit IV

Assignment Problems:

Definition of Assignment Problem, comparison with Transportation Problem, formulation and solution of Assignment Problem using Hungarian Method (Minimization and Maximization), Travelling Salesman Problem.

Unit V

Sequencing and Scheduling: Johnson's Algorithm for processing n jobs through 2 machines, Algorithm for processing n jobs through 3 or more machines, Processing 2 jobs through n machines.

Text Books:

- 1) Gillet B.E., Introduction to Operation Research, Computer Oriented Algorithmic Approach, Tata McGraw Hill publishing Co. Ltd., New Delhi.
- 2) P.K.Gupta & D.S. Hira, Operations Research, S. Chand & Co.

References Books:

- 1) Taha H.A., Operations Research: AN Introduction, Mc Millian Co., New York.
- 2) N.S. Kambo, Mathematical Programming Techniques, Affiliated East West Press Pvt. Ltd., New Delhi, 1984.
- 3) R. Pannesarlvam, Operations Resaerch, Prentic Hall of India Pvt. Ltd., New Delhi, 2004.
- 4) S.D. Sharma, Operations Research, Kedar Nath & Co. Meerut.
- 5) Gupta. Kanti Swaroop, Gupta P.K. and Manmohan, Operations Research, Sultan Chand and Sons, New Delhi.

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BCA – 602: Internet and Web Technology Using PHP

Max. Marks: 50

Min Marks: 17

Course Objectives: The course objective is to understand the principles of creating an effective web page using HTML, CSS and the concepts on web designing and development using PHP and MySQL

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Develop an understanding about the basic concepts of web page design using HTML and CSS.
- 2) Develop an understanding about the web site development using PHP.
- 3) Create powerful and dynamic web applications using PHP and MySQL.
- 4) Build a simple, yet functional web application using PHP/MySQL.

Unit I

Web Technology: Introduction to WWW, web browsers, web servers, HTTP, URL.

HTML: Introduction, Objective, HTML Command Tags: Text, List, Table, creation of links, inserting graphics, forms.

Cascading style sheets: Introduction to CSS

Unit II

A Brief History of PHP, PHP Characteristics, Installing and Configuring PHP on Windows, PHP Language Basics: Lexical Structure, Data Types, Variables, Expressions and Operators, Decision Statements, Flow Control Statements, Embedding PHP in Web Pages.

Strings: String Constants, Printing Strings, Accessing Individual Characters, String Handling Functions: length, Word count, string position, reverse, replace.

Maths: max, min, sqrt, sin, cos, tan, sinh, cosh, tanh, abs, count, ceil, round, floor, log, log10, pow() functions.

Arrays: Indexed Arrays, Associative Arrays, Identifying Elements of an Array, Storing Data in Arrays, Multidimensional Arrays, extracting multiple values, converting between arrays and variables, Traversing Arrays.

Unit III

Session: Session handling, creating session, storing values in session, accessing values from session, destroying session. Cookies: creating cooking, setting values, accessing cookies values, session cookie, persistant cookie, redirecting page.

Functions: Calling a Function, Defining a Function, Variable Scope, Function Parameters, Return Values, Variable Functions.

Object Oriented Programming Concepts: Classes, Objects, Member Functions, Encapsulations, Inheritance, and Polymorphism. (only basic definitions of these topics).

Unit IV

Form Handling in PHP: Setting Up Web Pages to Communicate with PHP, Handling Text Fields, Text Areas, Check box, Radio button, Submit, Reset, Button, Image Button, Select Box, input type email, password, date and url.

File Handling: Working with files: File Open and Read, File Create and Write, Reading and writing Character in file, reading entire file, Rename and Delete File, File Uploading.

Unit V

Database Access: Using PHP to access a database. Introduction to MySQL, connectivity with MySQL.

Creating form and saving data of form to MySQL. Performing CRUD operation using PHP and MySQL.

Text Books:

- 1) Programming PHP by Rasmus Lerdorf and Kevin Tatroe, O'Reilly Publications
- 2) Beginning PHP5 by Wrox Publication
- 3) Mastering PHP : BPB Publication
- 4) PHP 5.1 for beginners by Evan Bayross and Sharman Shah, SPD Publications
- 5) PHP 5.2 The Complete Reference by Steven Holzner, Mc Graw Hill Edition 2008.

CS – 603: Computer Graphics & Multimedia

Max. Marks: 50

Min Marks: 17

Course Objectives: The objective of the course is to provide comprehensive introduction about computer graphics system, design algorithms, two-dimensional transformations, techniques of clipping, three-dimensional graphics and three-dimensional transformations.

Course Outcome: It is expected that after completion of the course, students will able to

- 1) Learn the basic concepts of computer graphics.
- 2) Implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
- 3) Create 2D animations using tools.
- 4) Create 3D graphical scenes using open graphics library suits.
- 5) Implement image manipulation and enhancement.
- 6) Learn fundamentals of animation and its related technologies.

Unit I

Computer Graphics: Introduction, Application of Computer Graphics, Display Devices: Refresh Cathode -Ray Tubes, Raster Scan Displays, Random Scan Displays, Color CRT Monitors, Flat Panel Displays. Video cards/display cards. Input Devices: Mouse, Trackball, Space ball, Data Glove, Joystick, Light pen, Scanner, Digital Camera, Touch Panels, Voice Systems. Hardcopy Devices: Printers and Plotters.

Unit II

Graphics Primitives: Line Generation Algorithms: DDA algorithm, Bresenham's algorithm. Circle Generation Algorithms: Midpoint Circle algorithm, Bresenham's circle generation algorithm. Displaying Lines, characters and polygon: Polygon filling Algorithms: Scan Line Polygon fill algorithm, Inside - Outside Tests, Boundary-Fill algorithm, Flood - Fill algorithm. Fundamentals of Aliasing, Antialiasing Technique.

Unit III

Clipping: Clipping operations. Point clipping. Line clipping: Cohen Sutherland Algorithm, Liang Barsky Algorithm, Nicholl-Lee-Nicholl Algorithm. Polygon clipping: Sutherland-Hodgeman Algorithm, Weiler Atherton Algorithm. Text clipping, Exterior clipping.

Unit IV

Two Dimensional: Two Dimensional Transformations: Translation, Scaling, Rotation, Reflection, Shear, Homogenous coordinate system, Composite transformations, Raster method of transformation. Two- Dimensional Viewing: Window to Viewport coordinates transformation.

Unit V

Multimedia: Introduction, Multimedia applications, Multimedia data and File formats, Multimedia tools. Advancements in the technology in Computer graphics and Multimedia.

Text Books:

- 1) Donald Hearn and M. Pauline Baker, *Computer Graphics: C Version*, Second Edition, Prentice Hall of India.
- 2) Tay Vaughan, *Multimedia: Making it Works*, Seventh Edition, Tata McGraw-Hill Professional, New Delhi.

Reference Books:

- 1) David F. Rogers, *Procedural Elements for Computer Graphics*, Tata Mc-Graw-Hill Publishing Company Ltd., New Delhi, 2001.
- 2) James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, *Computer Graphics: Principles and Practice in C*, Second Edition, Addison-Wesley Professional.
- 3) Zhigang Xiang, Roy A. Plastock, *Schaum's outline of Theory and Problems of Computer Graphics*, Second Edition, Tata McGraw-Hill Professional, New Delhi.

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BCA – 604: Principles and Practices of Management

Max.Marks:40

Min.Marks:13

Course Objectives: The course aims to help the students to be aware of the primary functions & responsibilities of managers, and understand the environment of an organization.

Course Outcomes: It is expected that after completion of the course, students will able to

- 1) Understand the concepts related to business.
- 2) Understand the roles, skills and functions of management.
- 3) Understand the complexities associated with the management of resources in the organization.

Unit I

The Nature of Management: Definition and role of management, Functions of Manager, Scientific Management, Human Relations school of Management, Contingency Theory of Management.

Unit II

Planning: Nature and Purpose of Planning, Components of Planning, objective of Business Management by Objectives.

Unit III

Organizing: Nature of Purpose of Organizing, Departmentation, Span of management, Delegation of Authority, Line and Staff Relationships. Staffing: Nature of staffing, problems faced in staffing, process of staffing.

Unit IV

Directing Process: Principles of Direction, Problems in Human Relation, Strategies for Establishing Healthy Human Relations.

Unit V

Control: Meaning and Process of Control, Control Techniques.

Text Book:

- 1) "Principles of Management", Harold Koontz, O'Donnel and Heinz Weihrich, New York: McGraw Hill Book Co

Reference Books:

- 1) "Management", Stoner, Freeman and Gilbert Jr., PHI, 6th Ed.
- 2) "Organization and Management Concepts", R.D. Agarwal, New Delhi, Tata McGraw Hill. 1995.
- 3) "Management", Robbins and Coulter, PHI, 8th Ed.
- 4) "A. - Fundamentals of Management: Essential Concepts and Applications", Robbins S. P. and Decenzo David, Pearson Education, 5th Ed.

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5) "Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets", Hillier Frederick S. and Hillier Mark S. Tata McGraw Hill, 2nd Ed., 2008.

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BCA – 605: PROJECT

Max. Marks: 60

Min.Marks:33

The students are expected to work on a project in their final year. The student can formulate a project problem with the help of her/his Guide and submit the project proposal of the same. If approved, the student can commence working on it and complete it. The Project comprises of 25 marks, of which Project Demonstration & Report is evaluated for 20 marks and the Viva-Voce is for 15 marks by the external examiner.

Project Report Guidelines

I Introduction

- Project Introduction
- Existing System with limitations
- Proposed System with aim and objectives
- Preliminary investigation
- Feasibility study
- Software/ hardware Requirements

II System Analysis

- Functional and non-functional requirements
- System Flowcharts
- Data Flow Diagram
- E-R Diagrams

III System Design

- Architectural design
- File / Database Design
- Normalization
- User Interface Design

IV Coding

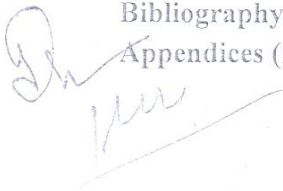
VI System Testing

- Testing techniques and Testing strategies used
- Testing Plan used
- Test reports for Unit Test Cases and System Test Cases

VIII Conclusions

Bibliography

Appendices (if any)



BCA – 606: Computer Graphics & Multimedia (LAB)

Max. Marks: 25

Min Marks: 09

- 1) Write a program to implement DDA algorithm
- 2) Write a program to implement Bresenham algorithm
- 3) Write a program to implement circle generating algorithm
- 4) Write a program to implement ellipse generating algorithm
- 5) Write a program to implement scaling on polygon.
- 6) Write a program to implement transferring on polygon.
- 7) Write a program to implement rotation on polygon.
- 8) Write a program to implement reflection on polygon.
- 9) Write a Program to implement set of Basic Transformations on Polygon i.e. translation, Rotation and Scaling.
- 10) Write a program to implement set of Composite Transformations on Polygon i.e Reflection, Shear (x & Y), rotation about an arbitrary point.
- 11) Write a program to implement Line Clipping Algorithm using Cohen Sutherland Algorithm.
- 12) Write a program to implement Line Clipping Algorithm using Liang Barsky Algorithm.
- 13) Write a program to Implement Polygon Clipping Algorithm using Sutherland Hodgman
- 14) Algorithm
- 15) Determine the sequence of basic transformations that are equivalent to the x-direction and y- direction shearing matrix.
- 16) Show that transformation matrix for a reflection about the line $y=x$, is equivalent to a reflection relative to the x axis followed by a counter clockwise rotation of 90 degrees.
- 17) Modify the Liang-Barsky line clipping algorithm to polygon clipping.
- 18) Write a routine to clip an ellipse against a rectangular window.
- 19) Write a routine to implement exterior clipping on any part of a defined picture using any specified window.
- 20) Modify the BRESENHAM algorithm so that it will produce a dashed-line pattern. Dash length should be independent of slope.
- 21) Write a procedure to scan the interior of a specified ellipse into a solid color.
- 22) Modify the 4-connected boundary fill algorithm to avoid excess stacking.
- 23) Write the Scan line filling algorithm

BCA – 607: Practical on Internet and Web Technology Using PHP

Max. Marks: 25

Min. Marks: 09

- 1) Write down html code to design navigation menu for home, about us, contact us, registration and login page. Link all of them too.
- 2) Write down html code to list unordered list of items and link each item to another page which will show detail about them.
- 3) Write down html code to design 4 sections using div tags. Each section will show image, link, ordered list and an image which is a link to another html page respectively.
- 4) Write down html code to design 5 sections using table tags.
- 5) Write down html code to design a registration form like facebook.com using div.
- 6) Write down html code to design registration form in four steps.
- 7) Write down html code to design login form like Gmail.
- 8) Write down html code to design a bill. The bill should contain date of invoice, different items, quantity, price of single item and total price.
- 9) WAP to print hello world using php .
- 10) WAP to print Character, Boolean, Integer and Floating values using single variable.
- 11) WAP to reverse a string using strrev function
- 12) WAP to demonstrate strlen, strstr, strpos, stripos, stristr functions.
- 13) WAP to search a string within string.
- 14) WAP to sum of all digits of number.
- 15) WAP to print pattern like
1
1 2
1 2 3
1 2 3 4
- 16) WAP to print pattern like
*
*
**

- 17) WAP to demonstrate sin, cos, tan, sinh, cosh, tanh, sqrt, abs, pow, max and min functions.
- 18) WAP to create an array of character and reverse the characters in array.
- 19) WAP to create an array of item price and print maximum price.
- 20) WAP to create array of strings and calculate length of each string.
- 21) WAP to break a string using explode function with following comma, white space and dollar symbol. After breaking store all in an array.
- 22) WAP for matrix multiplication.
- 23) WAP for storing and displaying student roll no and marks in associative array.
- 24) WAP to create a multi-dimensional array. In the array row index will be integer and column index will be string. For example \$a[0]['id'], \$a[0]['name'], \$a[0]['dob'], \$a[1]['id'], \$a[1]['name'], \$a[1]['dob'] and so on.

- 25) WAP to create user defined function to print hello world.
- 26) WAP to create user defined function to reverse the string.
- 27) WAP to create user defined function to swap value of two variables.
- 28) WAP to create a function to find out maximum of four numbers.
- 29) WAP to create class to show use of class.
- 30) WAP to create class, in which one function will set variable like name, id and salary. Another function will be called to show all these details.
- 31) WAP to create a class which will have function for area. The second class will inherit it and override the function area.
- 32) WAP print maximum of three numbers accepted from user.
- 33) WAP to print average of 5 numbers. Input will be taken from the user using form tag.
- 34) WAP to take username, address, phone number and date of birth from user and then print them all on html page using PHP code in page design using html.
- 35) WAP to accept the name of user from html form and check its length. If the length is less than 7 or greater than 14, redirect it to same page and print the error message; if name is within given length take page to another page and print welcome message.
- 36) WAP to create session using set some value in session like name and print the name on another page using session.
- 37) WAP to store username in session, take input from user, redirect to another page and print username from session.
- 38) WAP to take username and password. Check it in database. If record is found, then user will redirect to home page and on home page all details will be displayed. Following options should be there – edit profile, change password, logout, user session to store user name and check them on each page. If session expires, user will be directed to another page.
- 39) WAP to create cookie to store a name.
- 40) WAP to access cookie data and display them.
- 41) WAP to create “keep me signed in” as in gmail and yahoo.
- 42) WAP to create session cookie.
- 43) WAP to create persistent cookie.
- 44) WAP to create a file and store user details entered by user with the help of form.
- 45) WAP to print information of the file. The file name will be given by the user.
- 46) WAP to copy contents of one file to another file.
- 47) WAP to connect MySQL database using PDO and MySQLI connection object.
- 48) WAP to create login with MySQL database. User will enter username and password. Write SQL command which will take username and password and check with database table. If record is found all details of user will be displayed.
- 49) WAP to create signup form and store all user information in database. Check that no duplicate username will be stored.
- 50) WAP to display all user data store in database table.
- 51) WAP to edit user record by selecting a user from list of all users.
- 52) WAP to delete user record by selecting a user from list of all users.