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 Amitabh 5/10/18

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.

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.

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 from 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)

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 portability, relative frequency definition theorems of total & compound portability, 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 last 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.

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 s tarted 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, micro with arguments, file inclusion, conditional, #if, #elif, miscellaneous directives, #include, #define, #undef, #pragma directives.

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

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: Area = PI * r2
4. Write a C program to find the area and volume of sphere. Formulas are: Area = 4*PI*R*R Volume = 4/3*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+..... ii) 2+4+..... iii) 1+3+..... iv) 1+2/2!+3/3!+.....

v) $1+x/1!+x^2/2!+x3/^3!+$.....

vi) $1-x/1!+x^2/2!-x3/^3!+$.....

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.

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

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

Sandip Dalal

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)

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.

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.

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 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

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 futures of Constitution, fundamental rights, fundamental duties.

TEXT BOOK :

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

SEMESTER – II

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 & Tailor'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.

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.

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.

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

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 follwing 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.
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)

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.

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, 4rth Edition, William Stallings, Pearson Education, 2003.

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 भाषाः

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

ख अशुद्वियों और उनका संशाधनः

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

ईकाई 2

क हिन्दी का शब्द भंडारः

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 अशुद्वियां, 7. विराम चिन्ह

ईकाई 3

पत्र लेखन, सार लेखन, पल्लवनः

1. पत्रों के उदाहरण, 2. पत्रों के प्रकार, 3. पत्र लेखन की विशेषताएं (पत्र लेखन, संबोधन, अंत में दिनाकं 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

<u>पाठ्यपुस्तकः भारतीयता के अमर स्वर, प्रकाशनः म.प्र. हिन्दी ग्रंथ अकादमी, भोपाल</u>।

अनुकमणिका

खण्ड एकः पाठ्य सामग्री

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

खण्ड दोः हिन्दी भाषाय सम्प्रेपण कौशल

ईकाई 1 क. मानक हिन्दी भाषा
ख. अशुद्वियों 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 तीनः 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 संस्कति का विश्व पर प्रभाव
ख. मध्य प्रदेश का सांस्कृतिक वैभव