BCA-201: Mathematics-II

Level of Knowledge: Expert Knowledge
Course Objective: The objective of this course is to familiarize the students with Calculus.
Scheme of Examination
Total marks 100.
Internal marks 40.
External marks 60.
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1.
Curve Tracing: Tracing of curves with equations in Cartesian & polar forms.
Rectification: Lengths of curves, Intrinsic Equations
Unit 2
Multiple Integrals: Integration of functions of two & three variables, Double & Triple Integrals, Dirichlet's integral, Use of double and triple integrals in finding areas and volumes.

Improper Integrals: Definition, Types, Convergence of improper integrals,
Evaluation of convergent improper integrals of both types with the help of various tests.
Unit 3
Gamma and Beta Functions: Gamma and Beta functions and their properties, some important deductions (Duplication formula)
Vector Integration: Definition, Line, Surface and Volume Integral, Gauss's and Stoke's theorems and some applications.
Unit 4
Maxima & Minima: Maxima & Minima functions of two and three variables,
Partial Differential: Function of several variables, Limits, Continuity and Differentiability, Partial derivatives. Euler's theorem, Mean value theorem & Taylor's theorem, Lagrange's Method of undetermined multipliers.

Unit 5
Convergence &Divergence of Series: Definition, Cauchy's Principle of Convergence, Various tests like: Comparison test, p-series test, Cauchy's Root. Test, D Alembert's Ratio test.

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Text Readings

1. Agrawal D.C. :**Mathematics II,** Shree Sai Prakashan, Meerut 2nd Edition
2. Pathak H. K. & Agrawal D.C. : **Text Book of Calculus** , Shikha Sahitya Prakashan, Indore 5th Edition
3. Pathak H. K. &. Agrawal D.C: **Vector Calculus & Geometry** Shikha Sahitya Prakashan, Indore 5th Edition.

BCA-202: Statistical Methods-II

Level of Knowledge: Expert Knowledge
Course Objective The objective of this course is to familiarize the students with Statistics.

Scheme of Examination
Total marks 100.
Internal marks 40.
External marks 60.
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1
Estimation Theory: Basic concepts of Unbiasedness, Consistency, Efficiency and Sufficiency of Estimators.
Sampling: Introduction, Different methods of sampling
Unit 2
Testing of Hypothesis: Simple and Composite hypothesis ,Errors of kind- I and kind - II, Critical region, Level of significance, size and power of a test,NeymannPearson's fundamental lemma and its application (with proof).
Unit 3
Tests of Significance: Test of simple hypothesis, Chi-square, t, F, Z distribution and tests based on them.
Unit 4
Non-Parametric Tests: Sign test, Median test, Wilcoxon's run test, Wilcoxon's Signed rank test, Contingency tables.
Unit 5
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 Readings:

1. .Agrawal D.C: **Statistical Methods II** , Shree Sai Prakashan Merrut 2nd Edition
2. Gupta S.P: **Statistical Methods ,** Sultan Chand & Sons, New Delhi,35th Revised Edition

Suggested Readings:

1. Spiegel, M.R.: **Statistics Schaum's outline series**, McGraw Hill Publishing Company Edition, 2000.
2. Kapoor & Saxena: **Mathematical statistics**, S. Chand & sons 18th Edition.
3. Pathak H.K, **Statistical Methods** , Shikha Sahitya Prakashan, Indore Revised Edition.

BCA-203: Physics-II

Level of Knowledge: Working Knowledge

Course Objective:
The objective of this course is to familiarize the students with basic concepts of Semiconductor devices and different phenomena related to them.

Scheme of Examination
Total marks- 100
Internal marks- 40
External marks- 60

The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents

Unit 1

Diodes: *p-n* junction diode, its working, Forward and Reverse biasing, Characteristics, Reverse Voltage Breakdown, Temperature Dependence, Depletion Region, Junction Capacitance, Zener Diode and Tunnel Diode, Light Emitting Diode (LED), Solar Cell.

Unit 2

Transistors: Bipolar Junction Transistor (BJT), and their working, Their Characteristics in CB, CE and CC mode, α and β of transistors, Transistor Biasing, Equivalent Circuit, *h*-parameter, *h*-parameter equivalent circuit.

Unit 3

Field Effect Transistor: JFET, Volt-Ampere curve, Biasing JFET, AC operation of JFET, Source Follower, Depletion and Enhancement Mode, MOSFET, Biasing MOSFET, Digital MOSFET Circuit.

Unit 4

Amplifiers: Single stage CB, CE and CC amplifiers and their comparison, Classification of Amplifiers, Emitter follower, Cascade amplifiers, RC Coupled amplifiers, gain frequency response, input and output impedance, Multistage amplifiers, Transformer coupled amplifier, Equivalent circuits at low, medium and high frequencies, Noise in electronic circuits.

Unit 5

Oscillators: Feedback in amplifiers, principle, Its effect on Amplifier Characteristics, Classification of Oscillator, Principle of Feedback Oscillator, Analysis of Tuned Collector, Tuned Base, Hartley, Colpitt Oscillator

Modulation: Need of Modulation, Three types of Modulation, Frequency Spectrum and Power in *am-wave,*. A typical *am* circuit, Linear diode detector.

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Text Readings:

1. Electronic Principles: Malvino, Tata McGraw Hill Publishing Company Limited, New Delhi, Sixth Edition
2. Unified Physics: R.P.Goyal, Shivlal Agrawal & Company, Indore 2007

Suggested Readings

1. Engineering Physics: R. K. Gaur & S. L. Gupta**.** Dhanpat Rai Publication8th Edition
2. Modern Engineering Physics : A.S.Vasudera

BCA – 204 : 'C' PROGRAMMING
Problem Solving and Programming with C Language-II

Level of Knowledge: Expert Knowledge
Course Objective: The objective of this course is to make the student understand programming language, programming, and concept of loops, reading a set of data, stepwise refinement, function, control structure and arrays. After completion of this course the student is expected to analyze the real life problems and write a program in 'C' language to solve problem. The main emphasis of the course will be on problem solving aspect that is developing proper algorithms.
Scheme of Examination
Total marks 100.
Internal marks 20.
Practical Marks 20
External Marks 60
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.

Course Contents
Unit 1.
Functions: What is Function, Why use Function, Passing values between Functions, Scope rule of Functions
Advance Features of Functions: Function Declaration and Prototypes, Call by value, and Call by Reference, Back to Function Calls, Macro verses Function, Recursion, need of Recursion, Types of Recursion.
Unit 2.
Pointers: What is Pointer, Pointer Assignment, Pointers and Arrays, Passing entire Array to Function, Pointers and 2D array, Pointers Array, Pointer to Array, Array of Pointers to String, Pointer to Structure, Use of Pointer, Malloc, Calloc Library Functions.
Unions: Union Definition and declaration, Accessing a Union Member, Union of Structure, Initialization of Union Member, Use of a Union Member, Uses of Union, use of user defined Datatypes.

Unit 3.
Types of I/O, Console Input/Output Functions: .Formatted Console I/O Functions, sprintf() and sscanf() functions, Unformatted Console I/O Functions
Disk I/O Functions: File Opening Modes, Writing, Closing File (Fclose), A File Copy Program, Using Argc, Argv, String I/O in files, Formatted Disk I/O functions, Text versus Binary Mode, Record I/O in Files, Detecting Error in Reading and Writing . I/O redirection in DOS.

Unit 4.
Components of VDU: Display Adapters, Display Screen (monitor) Video Display modes, Resolution.
Text or Graphics: Colors in Text Mode, Colors in Graphical Mode, Video Pages, Writing to VDU Memory in text mode.
Unit 5.
Graphics Programming: Lines, Stylish Lines, Drawing and Filling images, Patterns with a differences, Bar()
Filling regular and Non Regular Shapes of platters and Colors, Outputting Text, Justifying Text, A Bit of Animation System Metrics

List of Suggested Practicals

1. To find square root of a nos. without using built in function.
2. To find factorial of a no..
3. To find factorial of a no using recursion.
4. To reverse the digit of a no.
5. To reverse the given sting.
6. To search a name in a record of students.
7. To create a record having five fields.
8. To exchange the value of two variable using function
9. To add two no using pointer.
10. To create a file of character.
11. To read a file.
12. To create a file of integer.
13. To create a file of record.
14. To copy a file.
15. To merge two files.
16. To find transpose of a matrix.
17. To find inverse of a matrix.
18. To convert lowercase string to uppercase.
19. To read character from one text file convert into uppercase and length into other file.
20. Write a program which ask date of birth in dd/mm/yy format and spell it in word.
21. To find out twins prime no..
22. To enter a four digit no. & print it all combination.
23. Write a Mark sheet program using file.
24. Write a payroll program using file.
25. Partitioning of an array.
26. Removal of duplicity in an array.

Note:

1 Every student will be given 3 periods/week laboratory (1 period = 1 hour)

2.Every student will work on independent Computer (Student : Computer = 1:1)

Text Readings

1. Y. Kanetkar, **Let us C,** BPB Publications, New Delhi, 6th Edition
2. T. Jeyapoovan **First Course in Programming with 'C',** (Vikas Publication, New Delhi)

Suggested Readings

1. ELSEVIER, **Programming and Problem Solving through 'C'**3rd Edition
2. E. Balagurusamy, **Programming in 'C'** (TATA McGRAW Hill) 4th Edition
3. Brain W Kernigham and Dennis M Ritchie, **The C Programming language** 2nd Edition
4. **Practical C Programming,** A Nutshell Handbook ,3rd Edition

BCA –205 INTRODUCTION TO INTERNET

Level of Knowledge: Expert Knowledge
Course Objective The objective of this course is to provide the students with the skills they can use to be effective business leaders in their organization and to provide core of IS principal with which every student should be familiar.
T**heme of Examination**
Total marks 100.
Internal marks 20
Practical marks 20
External marks 60
The question paper will contain questions equally distributed in all units. The papers may contain the combination of Numerical/Objective/ Conceptual /Analytical/ Theoretical in each question.
Course Contents
Unit 1.
Information Concepts, System & Modeling Concepts, What is Information System, Business Information System, System Development, Need to Learn Information System, Organization & Information System, Competitive Advantage, Performance based Information System, Careers in Information Systems.
Unit 2.
H/w: Component, Processing & Memory Devices, Secondary Storage, Input and Output Devices.
S/W: Overview of S/w, System & application S/w, Programming Languages, S/w Issues and Trends.
Unit 3.
Data Management, Data Modeling and Database Models, Database Management Systems, Database Applications
Unit 4.
Overview of Communication Systems, Telecommunications, Network & Distributed Processing, Telecommunication & Application.
Use & Functioning of the Internet, Internet Services, WWW, Intranets & Extranets Net Issues.
Unit 5.
Introduction to E-Commerce, Types of e-Commerce, e-Commerce Application, Electronic Payment System, Technologically Infrastructure of e-Commerce, Trends to E-Commerce, Strategy for Successive e-Commerce
Computer Waste and Mistakes, Computer Crimes, Privacy issues, Work Environment.

List of Suggested Practical

- Understanding of a dial up connection through modem.
- Configuring a computer for an e-mail and using Outlook Express or Netscape
- Messenger.
- Registering an e-mail address.
- Understanding of address book maintenance for e-mail.
- Understanding of e-mail drafting.
- Understanding of different Mail program tools.
- Send and receive functions of e-mail.
- Using the Internet for search using search engines.
- Understanding of sites like VSNL, Rediff, Indiainfoline, zeenext, AOL, yahoo,
- Hotmail, mail city etc.
- News services on Internet.
- Downloading of Tutorials from the Internet from educational sites.
- Web surfing through Internet Explorer, Mozilla Firefox, Netscape Navigator,
- Using Netscape Communication suite.
- Using Front page or Notepad etc. for web Design.

Text Readings

1. Ralph Stair & George Reynolds, "**Principles of Information Systems: A Managerial Approach",** Cengage Learning , New Delhi,2008 Edition
2. V.Rajaramn, "**Introduction to Information Technology**", Pretic Hall of India New Delhi 2006 Edition

Suggested Readings

1. P.K.Sinha & Priti Sinha**, " Computer Fundamentals Concept, Systems & Applications",** BPB Publication New Delhi 3rd Edition
2. Ravi Kalakotta & Whinston B., **"Frontiers of e-Commerce"**, Pearson Education, Reprint 2009, New Delhi

Note:

1 Every student will be given 3 periods/week laboratory (1 period = 1 hour)

2 .Every student will work on independent Computer (Student: Computer = 1:1)