

BCA- 51 JAVASCRIPT

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- illustrate the basic concepts and building blocks of java programming using tire architecture approach.
- learn how to write moderately complex programs efficiently.
- learn making Web based application in Java.

Learning Outcomes: At the end of this course, the student will be able to:

- know essential concepts, principles and theories of Java relating the Web application.
- develop real world programming problems and applications efficiently using advanced libraries of both technologies.
- knowing about advanced technologies using by experts in field of Information Technology.

Unit-I

HTML:

Structure of HTML documents, HTML Elements – Core attributes, Language attributes, Core Events, Block Level Events. Text Level Events, Linking Basics, Linking in HTML, Images and Anchors, Anchor Attributes, Image Maps, Semantic Linking Meta Information.

Unit-II

Introduction to JavaScript

Data types, variables, operators, expressions, statements, functions, objects, arrays, date, math, error handling, flow control, loops

Unit-III

JavaScript Object Model

Regular expression, JavaScript object model, Standard Document Object Model - creating nodes, namespace, DOM and HTML, DOM and CSS, Event handling, Event types.

Unit-IV

Windows, Frames and Overlay in JavaScript

Window object.dialogs, Controlling windows, form handling, form fields, form validation. UI elements, browser management, media management

Text Book:

1. The World of Scripting Languages, by David Barron, Wiley India Pvt Ltd.
2. JavaScript: The Complete Reference, 2013 by Thomas Powell, Fritz Schneider

Reference Books:

1. Introduction to JavaScript Object Notation: A To The Point Guide to JSON, by Linsay Bassett, O'Reilly
2. Ajax Black Book, Dreamtech Press
3. Scripting Languages: Perl, Python, Mumps, JavaScript, Php, Ruby, VBscript, Awk, command. Com. Sed, Bash, Autolisp. Tcl, Shell Script, Quakec, Books, LLC.

BCA- 52 INTRODUCTION TO LINUX

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- to develop software in and for Linux/UNIX environments.
- to know basic operating system concepts, effective command line usage, shell programming.

Learning Outcomes: At the end of this course, the student will be able to:

- learn to develop software for Linux/UNIX systems.
- learn the C language and get experience programming in C.
- learn the important Linux/UNIX library functions and system calls.

Unit-I

Unix Operating System, Knowing Your Machine, Linux and GNU, The Unix Architecture, Unix/Linux features, Command Usage, General Purpose Utilities- cal, date, echo, printf, bc, script, Email basics, passwd, who, uname, tty, stty, file system. Linux Startup , Accounts, accessing Linux – starting and shutting processes, logging in and logging out.

Unit-II

Handling Ordinary Files - cat, cp, rm, mv, more, lp, file, wc, od, cmp, comm, diff, gzip and gunzip, tar, zip and unzip etc., tee

Basic File Attributes- ls, file permissions, Directory Permissions, vi editor, The process, More file Attributes.

Unit-III

Simple Filters- pr, head, tail, cut, paste, sort, uniq, tr etc.

Filters using Regular Expressions- grep and sed.

Unit-IV

awk- An advanced filter- Simple filtering, splitting into fields, variables and expressions etc

perl- The master Manipulator- perl preliminaries, chop function, string handling functions, split, join, for each.

Process Control- pipe, signal, kill process

Text Books:

1. Sumitabhadass, Your Unix – The Ultimate Guide, TMH.
2. John Goerzen, Linux Programming Bible, IDG Books, New Delhi.

Reference Books:

1. Aho, Hopcroft and Ullman, the Design and Analysis of Computer Algorithms, Addison Wesley.
2. Yaswant Kanetkar, “Unix Shell Programming”, BPB Publication.

BCA- 53 DATA MINING AND DATA WAREHOUSING

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives

- to identify the scope and essentiality of Data Warehousing and Mining.
- to analyze data, choose relevant models and algorithms for respective applications.
- to study spatial and web data mining.
- to develop research interest towards advances in data mining.

Learning Outcomes: At the end of this course, the student will be able to:

- Understand Data Warehouse fundamentals, Data Mining Principles
- Design data warehouse with dimensional modeling and apply OLAP operations.
- Identify appropriate data mining algorithms to solve real world problems
- Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
- Describe complex data types with respect to spatial and web mining.
- Benefit the user experiences towards research and innovation. Integration.

Unit - I

Introduction to Data mining, Role Data in Data Mining, Data Mining functionalities, patterns in data mining, Type of patterns, Classification of Data Mining Systems, Major issues in Data Mining.

Unit –II

Introduction to Data Warehousing, The need for data warehousing, Operational & Informational Data Stores, Data Ware house Characteristics, Data Warehouse role & Structure, The cost of warehousing data.

Unit –III

Introduction to OLAP & OLTP, Difference between OLAP & OLTP. OLAP Operations. Building a Data Warehouse, Design/Technical/Implementation Considerations, Data Preprocessing Overview. Data Summarization, Data Cleaning, Data Transformation, Concept Hierarchy, Structure. Patterns & Models.

Unit -IV

Association Rule Mining: Mining single-dimensional Boolean association rules from transactional databases, mining multilevel association rules from transaction databases, Mining multidimensional association rules from relational databases and data warehouses, From association mining to correlation analysis, constraint-based association Mining

Text Books:

1. J. Han & M. Kamber, Data Mining: Concepts and Techniques, Morgan Kaufmann, 2nd ed, 2006. (Module 1)
2. Bing Liu. Web Data Mining, Exploring Hyperlinks, Contents and Usage Data, Springer Publishers (Module 2 and Module 3)
3. Data Warehousing, Data Mining, and OLAP, Alex Berson, First Edition, Tata McGraw Hill

4. Data Mining Concepts & Techniques, Jiawei Han & Micheline Kamber, Second Edition, Morgan Kaufmann Publishers
5. Modern Data Warehousing, Mining & Visualization Core Concepts, George M Marakas, First Edition, Pearson Education
6. Data Warehousing, Architecture & Implementation, Hawkin, Prentice Hall
7. Data Mining: Modelling Data for Marketing, Risk and Customer Relationship Mgmt, Rud, Olivia, Paperback Edition
8. Data Mining Techniques, Berry, Michael, Third Edition
9. Data Mining, Data Warehousing and OLAP, Sharma, Gajendra, Second Edition

References:

1. Margret H Dunham, Data Mining Introductory and advanced topics, Pearson Education, 6 th ed, 2009,
2. Shawkat Ali and Saleh Wasimi, Data Mining: Methods and Techniques, Cengage Learning, Indian Edition, 2009.

BCA- 54 ARTIFICIAL INTELLIGENCE

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- to study about intelligent agent and search methods.
- to study the concept of expert systems.
- to study about representing knowledge.
- to construct plan and methods for generating knowledge.

Learning Outcomes: At the end of this course, the student will be able to:

- understand what the AI is.
- apply search and knowledge representation techniques to solve AI problems.
- have ability to identify the solution of AI problems.

Unit-I

Overview of A.I.: Introduction to AI, AI and its related field, AI techniques, Criteria for success.

Problems, problem space and search: Defining the problem as a state space search, production system and its characteristics, Issues in the design of the search problem.

Unit-II

Knowledge representation: Definition and importance knowledge, knowledge representation , various approaches used in knowledge representation, Issues in knowledge representation.

Using Predicate Logic: Representing simple facts in logic, representing instances and is_a relationship, computable function and predicate.

Unit-III

Natural language processing: Introduction syntactic processing, semantic processing, Discourse and pragmatic processing.

Learning: Introduction learning, Rote learning, learning by taking advice, learning in problem solving, learning from example-induction, Explanation based learning.

Unit-IV

Expert System: Introduction, Representing using domain specific knowledge, Expert System shells.

Text Books:

1. Eugene Charniak, Drew McDermott, Introduction to Artificial Intelligence” Addison Wesley.
2. Wils J. Nilsson, Principles of Artificial Intelligence, Narosa Publishing house.

Reference Books:

1. Jackson Peter, Introduction to Expert systems, 3e, Addison Wesley, 2000.

BCA- 55 COMPUTER NETWORKS

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- to know the basic concepts of Networking.
- to make familiar with the working of latest network technologies and applications.

Learning Outcomes: At the end of this course, the student will be able to:

- will gain the knowledge of Networking models,
- different media for transmission, addressing types and their difference, routing protocols.
- will also gain knowledge of layered structure
- working of different network technologies used in today's world.

UNIT – I

Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Protocols: Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model, Network Architecture and the OSI Reference Model.

UNIT – II

Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Guided and Wireless Transmission Media; Switching and Multiplexing. Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways.

UNIT - III

Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring.

UNIT – IV

Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control Algorithms; Internetworking; Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric – Key Algorithms; Public-Key Algorithms;

TEXT BOOKS:

1. Michael A. Gallo, William M. Hancock, “Computer Communications and Networking Technologies”, CENGAGE Learning.
2. Andrew S. Tanenbaum, “Computer Networks”, Pearson Education.

REFERENCE BOOKS:

1. James F. Kurose, Keith W. Ross, “Computer Networking”, Pearson Education.
2. Behrouz A Forouzan, “Data Communications and Networking”, McGraw Hill.

BCA- 61 PYTHON PROGRAMMING

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus.

In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- to learn basics of Python programming
- to do Object Oriented Programming using Python
- Files Handling in Python
- GUI Programming and Databases operations in Python
- Network Programming in Python

Learning Outcomes: At the end of this course, the student will be able to:

- describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
- express different Decision Making statements and Functions
- interpret Object oriented programming in Python
- understand and summarize different File handling operations
- design and develop Client Server network applications using Python

UNIT-I

Introduction Installing and Working With Python, Tokens, Operators, Data Types, Sequence Types, Mapping Types: Dictionaries, Tuples. Control Structures: Conditional Branching, Looping, Custom Functions, Strings.

UNIT-II

Sequences, iteration and recursion. Modules And Packages Modules And Packages, Overview Of Python Standard Library.

UNIT-III

OOPS Concepts and Classes In Python, Constructor, deconstructor, inheritance, polymorphism, Exception handling: catching and raising exceptions, custom exceptions,

UNIT-IV

Database programming. Numpy basics: Introduction, data types, arrays: indexing, slicing, shape, iteration, join, split, search, sort, filter.

Text Books:

1. Mark Summerfield, "Programming in python
2. A Complete Introduction to Python Programming".

Reference Books:

1. Mark Lutz, "Learning Python", O Reily, 4th Edition, 2009.
2. Brian K. Jones, "Python Cookbook".
3. Alex Martelli, "Python in a nutshell".

BCA–62 Internet of Things

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- to connect people to physical things and also physical things to other physical things all in real time. It's becoming the Internet of Things (IoT).
- to understand the basics of Internet of things.
- to understand the concepts of Web of Things.

Learning Outcomes: At the end of this course, the student will be able to:

- identify the Components that form part of IoT Architecture.
- evaluate the appropriate protocol for communication between IoT.

Unit-I

Definition and Need of IoT, Characteristics of IoT, Physical Design of IoT – IoT Protocols, Logical Design of IoT, IoT Enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big Data Analytics, Communication Protocols, Embedded Systems, IoT Levels and Templates.

Unit-II

Types of IOTs. M2M Applications, Software Defined Networks, Network Function Virtualization. Need for IoT System Management, Simple Network Management Protocol, Network Operator Requirements.

Unit-III

IOT Devices: Building blocks, exemplary device: Raspberry PI Interfaces. Other IOT devices. Introduction to WAMP, Django, SkyNet

Unit-IV

Introduction to Apache Hadoop, Map reduce programming model, Hadoop Yarn, Apache Oozie, Apache Spark, Apache Storm

Text Books:

1. Internet of Things – A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, First Edition, 2015, University Press.
2. Designing the Internet of Things, Adrian McEwen (Author), Hakim Cassimally
3. Internet of Things (A Hands-on-Approach), Vijay Madisetti, Arshdeep Bahga

Reference Books:

1. The Internet of Things-Enabling Technologies, Platforms, and Use Cases, Pethuru Raj & Anupama C. Raman, CRC Press, 2017.
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014
3. The Definitive Guide to the Internet of Things for Business, Syed Zaem Hosain, Aeris Communications, 2016, 2nd edition.
4. Internet of Things: Architecture and Design Principals, Raj Kamal, McGrawHill, 2017.

BCA-63 INFORMATION SECURITY

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus. In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- to identify, analyse and remediate computer security breaches by learning and implementing the real-world scenarios in Network Security
- to exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization.
- to understand key terms and concepts in Cryptography, Governance and Compliance.

Learning Outcomes: At the end of this course, the student will be able to:

- analyse and evaluate the cyber security needs of an organization.
- determine and analyse software vulnerabilities and security solutions to reduce the risk of exploitation.
- Measure the performance and troubleshoot cyber security systems.

Unit - I

Introduction to Information Security: Security Goals, Attacks, Types of Attacks, Security Services and Mechanisms, Wireless Networks and Security: Components of wireless networks, Security issues in wireless

Unit – II

Asymmetric and symmetric Key Cryptography The Data Encryption Standard, The AES Encryption Algorithms, Public Key Encryptions, Uses of Encryption Elementary Cryptography: Substitution Ciphers, Transpositions, Making “Good” Encryption algorithms, Secure Architecture of an open System. DES and RSA Algorithm

Unit – III

Network and System Security: Security at the Application Layer: e-mail security, PGP and S/MIME. Security at the Transport Layer: Secure Socket Layer (SSL) and Transport Layer Security (TLS).

Unit - IV

Security at the Network Layer: IP Security. System Security: Malicious Software, Malicious Programs, Viruses, Worms, Malware, Firewalls.

Text Books:

1. Charles P. Pfleeger, Shari Lawrence. Security in Computing, Pfleeger. PHI.
2. Jason Andress. The Basics of Information Security, Syngress
3. Mark Stamp. Information Security: Principles and Practice, Wiley.
4. A. Kahate, Cryptography and Network Security, TMH.
5. B. A. Forouzan & D Mukhopadhyay, Cryptography and Network Security., McGraw Hill, 2nd ed. 2010

References Books:

1. B. Menezes, Network Security and Cryptography., Cengage Learning, 1st ed. 2010
2. Stallings, Cryptography and Network Security., PHI, 4th ed. 2010

BCA- 64 CLOUD COMPUTING

Maximum Marks: 100

External: 80

Time: 3 hours

Internal: 20

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus.

In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives:

- to presents a top-down view of cloud computing, from applications and administration to programming and infrastructure.
- to introduces students with various concepts like cloud systems, How Cloud Computing works, Service Models.
- to enables student to understand the basics of Internet of things. It introduces some of the application areas where Internet of Things can be applied. Students will learn about the middleware for Internet of Things.
- to understand the concepts of Web of Things.

Learning Outcomes: At the end of this course, the student will be able to:

- discover the fundamentals of Cloud Computing and explain the deployment methods of Cloud Computing.
- describe the architecture of Cloud systems.
- implement and secure your own cloud service.

UNIT – I

Overview of Computing Paradigm: Recent trends in Computing -Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing.

Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing, Applications cloud computing.

UNIT - II

Cloud Services

Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service- Monitoring as a Service – Communication as services.

Cloud Models: Cloud Characteristics - Measured Service - Cloud Models - Security in a Public Cloud Public versus Private Clouds - Cloud Infrastructure Self Service

UNIT – III

Cloud Management: Resiliency – Provisioning - Asset Management - Cloud Governance - High Availability and Disaster Recovery - Charging Models, Usage Reporting, Billing and Metering.

UNIT - IV

Virtualization

Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

Text Books:

1. Cloud Computing "A Practical Approach" Anthony T. Velte, Toby J. Velte, Robert Elsenpeter. McGraw-Hill.
2. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
3. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.

Reference Books:

1. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009. Kumar Saurabh, "Cloud Computing – insights into New -Era Infrastructure", Wiley India,2011.
2. Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.

BCA- 65 ENVIRONMENTAL STUDIES

Maximum Marks: 100

External: 40

Time: 3 hours

Internal:10

Note: Examiner will be required to set Nine Questions in all. First Question will be compulsory, consisting of objective type/short-answer type questions covering the entire syllabus.

In addition to that eight more questions will be set, two questions from each Unit. A candidate will be required to answer five questions in all, selecting one question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks.

Course Objectives: Students will

- to understand how science and the scientific method work to address environmental problems.
- to become familiar with the Earth's major systems
- to know how they function and how they are affected by human.

Course Outcomes: After completing the major in Environmental Studies, students will be able to:

- demonstrate an integrative approach to environmental issues with a focus on sustainability;
- use critical thinking, problem-solving,
- the methodological approaches of the social sciences, natural sciences, and
- humanities in environmental problem solving

Unit 1

Introduction: Definition, scope and importance: Concept of a neat clean environment, Ecology and Environment, Concept of an ecosystem, Its components and their interrelationships, autotrophs and heterotrophs, food chains, food webs and ecological pyramids, energy flow in the ecosystem, biogeochemical cycles, The concept of biosphere, ecosystem diversity and biodiversity, Global and national concerns, threats to biodiversity and conservation efforts.

Unit 2

Sustainable development: The apparent conflict between economic development and sanctity of the environment, Judicious use of resources for their long term viability; forest resources, water resources, mineral resources; food resources, energy resources and land resources, Renewable sources, the practice of 3Rs.

Unit 3

Environmental pollution: Air pollution, attributes of air environment; major pollutants, their natural and anthropogenic sources, effects and mitigation measures

Water pollution: attributes of water environment, major categories of pollutants; effects and mitigation measures.

Land pollution: Urban and industrial solid wastes and their management.

Noise pollution: Measurement, effects and control of noise pollution.

Unit 4

Sociopolitical issues: Global concerns, international endeavors and intergovernmental efforts: climate change, global warming, acid rain, ozone layer depletion, international bodies and protocols, Environmental laws and regulations in India.

Text books:

1. Odum, Eugene P. Fundamentals of ecology. Philadelphia: W. B. Saunders Company, 1953.
2. Peary, Rowe, Tchobanoglous Environmental Engineering, McGraw Hill

Reference Books:

1. Heywood and Waston, Global Biodiversity Assessment, CPCB.