

REVISED UG SYLLABUS UNDER CBCS
(Implemented from Academic Year, 2020-21)
PROGRAMME: FOUR YEAR B.Sc.(Hons)

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Skill Enhancement Courses (SECs) for Semester V, from 2022-23 (Syllabus with Learning Outcomes, References, Co-curricular Activities & Model Q.P. Pattern)

Structure of SECs for Semester – V
(To choose One pair from the three alternate pairs of SECs)

Univ. Code	Courses 6&7	Name of Course	Th. Hrs. / Week	IE Marks	EE Marks	Credits	Prac. Hrs./ Wk	Marks	Credits
	6A	ARTIFICIAL NEURAL NETWORK	3	25	75	3	3	50	2
	7A	NEURAL NETWORK AND FUZZY LOGIC	3	25	75	3	3	50	2

OR

	6B	CRYPTOGRAPHY AND NETWORK SECURITY	3	25	75	3	3	50	2
	7B	CYBER SECURITY	3	25	75	3	3	50	2

OR

	6C	DATA ANALYTICS USING R	3	25	75	3	3	50	2
	7C	DATA WAREHOUSING AND MINING	3	25	75	3	3	50	2

Note-1: For Semester–V, for the domain subject ARTIFICIAL INTELLIGENCE & ROBOTICS, any one of the three pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C. The pair shall not be broken (ABC allotment is random, not on any priority basis).

Note-2: One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate field skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the field skills embedded in the syllabus citing related real field situations.

VTH SEMESTER

SKILL ENHANCEMENT COURSES

SKILL ENHANCEMENT COURSE-I

- | | | | |
|-----|--------------------------------|---|------------------------|
| 6A. | ARTIFICIAL NEURAL NETWORK | - | LINUX LAB |
| 7A. | NEURAL NETWORK AND FUZZY LOGIC | - | ADVANCED PYTHON
LAB |

SKILL ENHANCEMENT COURSE-II

- | | | | |
|-----|-----------------------------------|---|--------------------|
| 6B. | CRYPTOGRAPHY AND NETWORK SECURITY | - | CRYPTOGRAPHY LAB |
| 7B. | CYBER SECURITY | - | CYBER SECURITY LAB |

SKILL ENHANCEMENT COURSE-III

- | | | | |
|-----|-----------------------------|---|-------------------|
| 6C. | DATA ANALYTICS WITH R | - | R LAB |
| 7C. | DATA WAREHOUSING AND MINING | - | DW AND MINING LAB |

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-6A: ARTIFICIAL NEURAL NETWORK
(Skill Enhancement Course (Elective), Credits: 03, Max.Marks:100)

Goal: This course will disseminate the student with the most fundamental knowledge for understanding AI and some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.

Course Objective: By the end of this course, a student will

- To introduce the student's fundamentals concepts of Neural network and its various
- application in computer science. To perform cognitive functions as problem solving and machine learning.

Teaching Learning Methodology:

Lectures, Class discussions, Demonstrations using various tools, Practical and Simulation Student Presentation, Problem solving or case studies. Use of flip chart board by instructor as aid in teaching.

UNIT I: Artificial Neural Networks (ANN) and biological neural networks, supervised and unsupervised learning rules, neural network applications.

UNIT II: Unsupervised learning: - Hebbian learning and competitive learning. Supervised learning:- Back propagation algorithms, Learning rule:- Delta learning rule, Widrow-Hoff learning rule, WinnerTake-All learning rule.

UNIT III: Feed forward neural network, feed backward neural network, Perception and its learning law, singlelayer perception, multi-layer perception.

UNIT IV: Self-organizing networks: Kohonen algorithm, Hopfield Networks: Hopfield network algorithm, Adaptive resonance theory: Network and learning rules.

UNIT V: Associative memory, auto-associative memory, bi-directional associative memory

TEXT BOOKS:

- Hill, T., Marquez, L., O'Connor, M., & Remus, W. (1994). Artificial neural network models for forecasting and decision making. International journal of forecasting, 10(1), 5-15.
- Suzuki, K. (Ed.). (2013). Artificial neural networks: architectures and applications. BoD—Books on Demand. Ermentrout, G. B., Beverlin, B., Troyer, T., & Netoff, T. I. (2011). The variance of phaseresetting curves. Journal of computational neuroscience, 31(2), 185-197.

Semester-wise Revised Syllabus under CBCS, 2020-21

Four-year B.Sc. (Hons)

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-6A: LINUX LAB
(Skill Enhancement Course (Elective), Credits: 02, Max.Marks:50)

LIST OF EXPERIMENTS:

1. Study and Practice on various commands like man, passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who.
2. Study and Practice on various commands like cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.
3.
 - a) Write a Shell Program to print all .txt files and .c files.
 - b) Write a Shell program to move a set of files to a specified directory.
 - c) Write a Shell program to display all the users who are currently logged in after a specified time.
 - d) Write a Shell Program to wish the user based on the login time.
4.
 - a) Simulate cat command.
 - b) Simulate cp command.
5.
 - a) Simulate head command.
 - b) Simulate tail command.
6.
 - a) Simulate mv command.
 - b) Simulate nl command.
7. Write a program to handle the signals like SIGINT, SIGQUIT, SIGFPE.
8. Implement the following IPC forms
 - a) FIFO
 - b) PIPE.
9. Implement message queue form of IPC.
10. Implement shared memory form of IPC.
11. Write a Socket program to print system date and time (Using TCP/IP).

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Four-year B.Sc. (Hons)

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-7A: NEURAL NETWORK AND FUZZY LOGIC
(Skill Enhancement Course (Elective), Credits: 03, Max.Marks:100)

Course Objective:

Fuzzy sets and fuzzy logic find many applications in the areas of stability theory, pattern recognition, controls etc. Neural Networks offer fundamentally alternative approaches to procedural programming. These systems proved their applicability to the problems where there are missing data or information or the problems which could not be defined in an algorithm. The integration of fuzzy systems and neural networks gives a tremendous potential which can be applied to many complicated problems of Artificial Intelligence and other applications in Real World Computing. This course provides a comprehensive treatment of neural network architectures and learning algorithms, with an in-depth look at problems in data mining and in knowledge discovery.

Course Contents:**UNIT-I:**

Basic neural computation models: Network and node properties. Inference and learning algorithms. Unsupervised learning: Signal hebbian learning and competitive learning. Supervised learning: Back propagation algorithms.

UNIT-II:

Self organizing networks: Kohonen algorithm, bi-directional associative memories. Hopfield Networks: Hopfield network algorithm. Adaptive resonance theory: Network and learning rules. Neural network applications.

UNIT-III:

Fuzzy Sets: Operations and properties.
Fuzzy Relations: Cardinality, Operations and properties.
Value Assignments: Cosine amplitude and max-min method.
Fuzzy classification: Cluster analysis and validity, Fuzzy e-means clustering, hardening the Fuzzy partition.

UNIT-IV:

Fuzzification, Membership value assignments: Inference, rank ordering and angular Fuzzy sets, defuzzification methods, fuzzy logic, approximate reasoning.
Fuzzy –based systems: Canonical rule forms, decomposition of compound rules, likelihood and truth qualification, aggregation of Fuzzy rules, graphical techniques of inference.

UNIT-V:

Non linear simulation using Fuzzy rule-based systems, Fuzzy associative memories. Decision making under Fuzzy states and Fuzzy actions. Fuzzy grammar and syntactic recognition. General Fuzzy logic controllers, special forms of Fuzzy logic control system models, examples of Fuzzy control system design and control problems, industrial applications.

TEXT BOOKS & REFERENCES:

1. Limin Fu. “Neural Networks in Computer Intelligence” McGraw Hill, 1995.
2. Freeman J. A., and Skapura D. Mu. “Neural Networks Algorithms applications and Programming Techniques”, Addison Wesley New York, 1991.

3. Timothy J. Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill 1997.
4. Bart Kosko "Neural Network and Fuzzy Systems", Prentice Hall of India, 1994.

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Four-year B.Sc. (Hons)

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-7A: ADVANCED PYTHON LAB

(Skill Enhancement Course (Elective), Credits: 02, Max.Marks:50)

1. DICTIONARY:

- a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure.
- b) Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

2. **NESTED LISTS:**

- a) Write a program to read a 3 X 3 matrix and find the transpose.
- b) Write a program to perform addition, subtraction of two 3 X 3 matrices.

3. **USER DEFINED FUNCTIONS:**

- a) Write a function ball collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.

Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius. If (distance between two balls centers) \leq (sum of their radii) then (they are colliding).

- b) Write a function to find mean, median, mode for the given set of numbers in a list.

4. **MODULES:**

- a) Install packages requests, flask and explore using (pip).
- b) Write a Python program that imports requests and fetch content from wiki page.

5. **DATE AND TIME:**

- a) Demonstrate Basic date and time classes, Different time formats, Converting between formats, Formatting dates and times, Parsing date/time information.
- b) Write a script that reads the current time and converts it to a time of day in hours, minutes, and seconds, plus the number of days since the epoch.

6. **CLASS AND OBJECTS:**

- a) Create a class ATM and define ATM operations to create account, deposit, check balance, withdraw and delete account. Use constructor to initialize members.
- b) Make a class Employee with a name and salary. Make a class Manager inherit from Employee. Add an instance variable, named department. Write a method that prints manager's name, department and salary. Make a class Executive inherit from Manager. Write a method that prints the string "Executive" followed by the information stored in the Manager super class object.

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Four-year B.Sc. (Hons)

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

**Course-6B: CRYPTOGRAPHY AND NETWORK SECURITY
(Skill Enhancement Course (Elective), Credits: 03, Max.Marks:100)**

Course Objective:

The objective here is to acquaint the students with the application of networking. Detail description of the various TCP/IP protocols and the working of ATM and its performance, Network security and authentication, and various algorithms related to it has been dealt, to get a practical approach.

Course Contents:

UNIT –I:

Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security.

Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, stenography, key range and key size, possible types of attacks.

UNIT – II:

Symmetric key Ciphers: Block Cipher principles & Algorithms(DES, AES, Blowfish), Differential and Linear Crypt analysis, Block cipher modes of operation, Stream ciphers, RC4, Location and placement of encryption function, Key distribution.

Asymmetric key Ciphers: Principles of public key cryptosystems, Algorithms(RSA, Diffie Hellman, ECC), Key Distribution.

UNIT – III:

Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm.

Authentication Applications: Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication.

UNIT – IV:

E-Mail Security: Pretty Good Privacy, S/MIME

IP Security: IP security overview, IP Security architecture, Authentication Header, Encapsulating security payload, combining security associations, key management.

UNIT – V:

Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction.

Intruders, virus and Firewalls: Intruders, Intrusion detection, password management, virus and related threats, Countermeasures, Firewall design principles, types of firewalls.

TEXT BOOKS:

1. Cryptography and Network Security : William Stallings, Pearson Education, 4th Edition
2. Cryptography and Network Security : Atul Kahate, Mc Graw Hill Edition

REFERENCE BOOKS:

1. Cryptography and Network Security: C K Shyamala, N Harin i, Dr T R Padmanabhan, Wiley India, 1st
2. Cryptography and Network Security : Forouzan Mukhopadhyay, MC Graw Hill, 2nd Edition.

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Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-6B: CRYPTOGRAPHY LAB

(Skill Enhancement Course (Elective), Credits: 02, Max.Marks:50)

LIST OF EXPERIMENTS:

Lab 1: Implementation of Caesar Cipher technique

Lab 2: Implement the Play fair Cipher

Lab 3: Implement the Pure Transposition Cipher

Lab 4: Implement DES Encryption and Decryption

Lab 5: Implement the AES Encryption and decryption

Lab 6: Implement RSA Encryption Algorithm

Lab 7: Implementation of Hash Functions

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Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-7B: CYBER SECURITY

(Skill Enhancement Course (Elective), Credits: 03, Max.Marks:100)

Objectives:

- The Cyber security course will provide the students with foundational Cyber Security principles, Security architecture, risk management, attacks, incidents and emerging IT and IS technologies.
- Students will gain insight into the importance of Cyber Security and the integral role of Cyber Security professionals.

Outcomes:

- Cyber Security architecture principles
- Identifying System and application security threats and vulnerabilities
- Identifying different classes of attacks
- Cyber Security incidents to apply appropriate response
- Describing risk management processes and practices
- Evaluation of decision making outcomes of Cyber Security scenarios

UNIT-I: Introduction to Cybercrime:

Introduction, Cybercrime: Definition and Origins of the Word, Cybercrime and Information Security, Who are Cybercriminals?, Classifications of Cybercrimes, Cybercrime: The Legal Perspectives, Cybercrimes: An Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes, Cybercrime Era: Survival Mantra for the Netizens.

UNIT-II: Cyber offenses:

How Criminals Plan them – Introduction, How Criminals Plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The fuel for Cybercrime, Attack Vector Cloud computing.

UNIT-III : Cybercrime mobile and Wireless Devices:

Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones.

Mobile Devices : Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies and Measures in Mobile computing Era, Laptops.

UNIT-IV: Tools and Methods used in Cybercrime:

Introduction, Proxy Servers and Anonymizers, Phishing, Password Cracking, Key loggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks, Phishing and Identity Theft: Introduction, Phishing, Identity Theft (IDTheft)

UNIT-V: Cybercrimes and Cyber security:

Why do we need cyber laws: The Indian context, the Indian IT Act, challenges to Indian Law and Cybercrime Scenario in India, Consequences of Not Addressing the Weakness in Information Technology Act, Digital Signatures and the Indian IT Act, Information Security Planning and Governance, Information Security Policy Standards, Practices, The information Blueprint, Security education, Training and awareness program, Continuing Strategies.

TEXTBOOKS:

1. Cyber Security: understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole, sunitBelapure, Wiley
2. Principles of information security, Micheal E. Whitman and Herbert J. Mattord, Cengage Learning.
3. Information Security, Mark Rhodes, Ousley, MGH

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Course-7B: CYBER SECURITY LAB

(Skill Enhancement Course (Elective), Credits: 02, Max.Marks:50)

LIST OF EXPERIMENTS:

1. Study of steps to protect your personal computer system by creating User Accounts with Passwords and types of User Accounts for safety and security.
2. Study the steps to protect a Microsoft Word Document of different version with different operating system.
3. Study the steps to remove Passwords from Microsoft Word.
4. Study various methods of protecting and securing databases.
5. Study “How to make strong passwords” and “passwords cracking techniques”.
6. Study the steps to hack a strong password.

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Domain Subject: B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)

Course-6C: DATA ANALYTICS USING R

(Skill Enhancement Course (Elective), Credits: 03, Max.Marks:100)

Learning Objectives: In this course students will learn R. Programming language, data analytics, data visualisation and statistical model for data analytics. By completion of this course, students will be able to become data analyst.

UNIT I: Introduction to Data Analysis: Overview of Data Analytics, Need of Data Analytics, Nature of Data, Classification of Data: Structured, Semi-Structured, Unstructured, Characteristics of Data, Applications of Data Analytics.

UNIT II: R Programming Basics : Overview of R programming, Environment setup with R Studio, R Commands, Variables and Data Types, Control Structures, Array, Matrix, Vectors, Factors, Functions, R packages.

UNIT III: Data Visualization using R: Reading and getting data into R (External Data): Using CSV files, XML files, Web Data, JSON files, Databases, Excel files. Working with R Charts and Graphs: Histograms, Boxplots, Bar Charts, Line Graphs, Scatterplots, Pie Charts.

UNIT IV: Statistics with R : Random Forest, Decision Tree, Normal and Binomial distributions, Time Series Analysis, Linear and Multiple Regression, Logistic Regression, Survival Analysis.

UNIT V: Prescriptive Analytics: Creating data for analytics through designed experiments, Creating data for analytics through active learning, Creating data for analytics through reinforcement learning.

TEXT BOOKS:

- An Introduction to R, Notes on R: A Programming Environment for Data Analysis and Graphics. W. N. Venables, D.M. Smith and the R Development Core Team. Version 3.0.1 (2013-05-16). URL: <https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf>

REFERENCE BOOKS:

1. Jared P Lander, R for everyone: advanced analytics and graphics, Pearson Education, 2013
2. Dunlop, Dorothy D., and Ajit C. Tamhane. Statistics and data analysis: from elementary to intermediate. Prentice Hall, 2000.
3. G Casella and R.L. Berger, Statistical Inference, Thomson Learning 2002
4. P. Dalgaard. Introductory Statistics with R, 2nd Edition. (Springer 2008)
5. Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer

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Four-year B.Sc. (Hons)

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-6C: R LAB

(Skill Enhancement Course (Elective), Credits: 02, Max.Marks:50)

LIST OF PROGRAMS:

1. Download and install R-Programming environment and install basic packages using `install.packages()` command in R.
2. Learn all the basics of R-Programming (Data types, Variables, Operators etc.)
3. Implement R-Loops with different examples.
4. Learn the basics of functions in R and implement with examples.
5. Implement data frames in R. Write a program to join columns and rows in a data frame using `cbind()` and `rbind()` in R.
6. Implement different String Manipulation functions in R.
7. Implement different data structures in R (Vectors, Lists, Data Frames)
8. Write a program to read a csv file and analyze the data in the file in R
9. Create pie charts and bar charts using R.
10. Create a data set and do statistical analysis on the data using R

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Four-year B.Sc. (Hons)

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**Course-7C: DATA WARE HOUSING AND MINING
(Skill Enhancement Course (Elective), Credits: 03, Max.Marks:100)**

Objectives:

- Students will be enabled to understand and implement classical models and algorithms in data warehousing and data mining.
- They will learn how to analyze the data, identify the problems, and choose the relevant models and algorithms to apply
- They will further be able to assess the strengths and weaknesses of various methods and algorithms and to analyze their behaviour.

Outcomes:

- Understand stages in building a Data Warehouse
- Understand the need and importance of preprocessing techniques.
- Understand the need and importance of Similarity and dissimilarity techniques
- Analyze and evaluate performance of algorithms for Association Rules
- Analyze Classification and Clustering algorithms.

UNIT-I:

Introduction: Why Data Mining? What is Data mining? What kinds of data can be mined? – What kinds of patterns can be mind? Which Technologies are used? Which kinds of Applications are targeted? Major Issues in Data Mining. Data Objects and Attribute Types, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity and Dissimilarity.

UNIT-II:

Data Pre-processing: Data Preprocessing : An Overview, Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization.

UNIT-III:

Classification: Basic Concepts, General Approach to solving a classification problem, Decision Tree Induction: Working of Decision Tree, building a decision tree, methods for expressing an attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction.

UNIT-IV:

Classification: Alternative Techniques, Bayes Theorem, Naive Bayesian Classification, Bayesian Belief Networks.

UNIT-V:

Association Analysis: Basic Concepts and Algorithms : Problem Defecation, Frequent Item Set generation, Rule generation, compact representation of frequent item sets.

TEXT BOOKS:

1. Introduction to Data Mining : Pang-Ning Tan & Michael Steinbach, Vipin Kumar, Pearson
 2. Data Mining concepts and Techniques, 3/e, Jiawei Han, Michel Kamber, Elsevier.
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Four-year B.Sc. (Hons)

Domain Subject: **B.SC (ARTIFICIAL INTELLIGENCE & ROBOTICS)**

Course-7C: DW AND MINING LAB

(Skill Enhancement Course (Elective), Credits: 02, Max.Marks:50)

SQL LAB:

A. Consider the following schema for a LibraryDatabase:

BOOK (Book_id, Title, Publisher_Name, Pub_Year)

BOOK_AUTHORS (Book_id, Author_Name)

PUBLISHER (Name, Address, Phone) BOOK_COPIES

(Book_id, Branch_id, No-of_Copies)

BOOK_LENDING (Book_id, Branch_id, Card_No, Date_Out, Due_Date)

LIBRARY_BRANCH (Branch_id, Branch_Name, Address)

Write SQL queries to:

1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch,etc.
2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun2017
3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.
4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.
5. Create a view of all books and its number of copies that are currently available in the Library.

B. Consider the following schema for OrderDatabase:

SALESMAN (Salesman_id, Name, City, Commission)

CUSTOMER (Customer_id, Cust_Name, City,Grade,Salesman_id)

ORDERS (Ord_No, Purchase_Amt, Ord_Date, Customer_id,Salesman_id)

Write SQL queries to:

1. Count the customers with grades above Bangalore's average.
2. Find the name and numbers of all salesmen who had more than one customer.
3. List all salesmen and indicate those who have and don't have customers in their cities (Use UNION operation.)
4. Create a view that finds the salesman who has the customer with the highest order of a day.
5. Demonstrate the DELETE operation by removing salesman with id 1000. All his orders must also be deleted

WEKA LAB:

1. Create data-set in arff file format. Demonstration of preprocessing on WEKA data-set.
2. Demonstration of Association rule process on data-set contact lenses.arff /supermarket using apriori algorithm.
3. Demonstration of classification rule process on WEKA data-set using j48 algorithm.
4. Demonstration of classification rule process on WEKA data-set using naive bayes algorithm.
5. Demonstration of clustering rule process on data-set iris.arff using simple k-means.

MODEL QUESTION PAPER (Sem-end. Exam)
B. Sc DEGREE EXAMINATION
SEMESTER –V
Course 6A: Artificial Neural Network

Time:3Hrs

Max.marks:75

Section - A

I. Answer all the following

5x10=50

1. A) Explain the biological prototype of neuron. Also explain the characteristics of neuron.

(OR)

B) Explain how neural network principles are useful in control applications.

2. A) Explain the Widrow-Hoff learning rule for supervised learning in neural networks with help of an example?

(OR)

B) Explain Back propagation with algorithm?

3. A) Explain Feed forward neural network?

(OR)

B) Explain Feed backward neural network?

4. A) Discuss algorithm for storage of conformation in Hopfield network.

(OR)

B) Explain the architectures of popular self-organizing maps?

5. A) Explain Bi-directional associative memory?

(OR)

B) Explain auto-associative memory with example?

Section - B

II. Answer any 5 from the following

5x5=25

1. Explain Application of neural network?
2. What is Supervised learning?
3. Explain Delta learning?
4. What is Perception?
5. Explain difference between Single layer perception and Multi-layer perception?
6. Explain Kohonen algorithm?
7. Explain learning rules?
8. Explain Associative memory?

MODEL QUESTION PAPER (Sem-end. Exam)

B. Sc DEGREE EXAMINATION

SEMESTER –V

Course 7A: Neural Network and Fuzzy Logic

Time:3Hrs

Max.marks:75

Section - A

I. Answer all the following

5x10=50

1. A) Explain network and node properties?

(OR)

B) Explain Unsupervised learning with an example model?

2. A) Explain bi-directional associative memory?
(OR)
B) Explain Hopfield network algorithm?
3. A) Explain Fuzzy Set Operation and properties?
(OR)
B) Explain Cluster analysis and validity?
4. A) Explain Fuzzification interface?
(OR)
B) Explain Graphical techniques of inference?
5. A) Explain Non linear simulation
(OR)
B) Explain Decision making under Fuzzy states and Fuzzy actions?

Section - B

II. Answer any 5 from the following

5x5=25

1. Explain Competitive learning?
2. What is Back propagation?
3. Explain Kohonen algorithm?
4. Explain Neural network applications
5. What is Fuzzy Relation Cardinality?
6. Explain Cluster analysis?
7. Explain Fuzzy associative memory?
8. Explain example of Fuzzy control system?

MODEL QUESTION PAPER (Sem-end. Exam)

B. Sc DEGREE EXAMINATION

SEMESTER –V

Course 6B: Cryptography and Network Security

Time:3Hrs

Max.marks:75

Section – A

I. Answer all the following

5x10=50

1. A) Explain principles of Security?
(OR)
B) Explain Symmetric and asymmetric key Cryptography?
2. A) Explain Block Cipher along with an Algorithm?

- (OR)
- B) Explain Principles of Public Key Cryptography?
3. A) Explain Hash Function?
(OR)
B) Explain Authentication Applications?
4. A) Explain E-Mail Security?
(OR)
B) Explain IP security architecture?
5. A) Explain Web Security?
(OR)
B) Explain types of Firewalls?

Section – B

II. Answer any 5 from the following

5x5=25

1. Explain Security Service?
2. Explain need for security?
3. Explain stenography?
4. Explain Stream ciphers?
5. Explain Asymmetrix key Ciphers?
6. Explain Knapsack Algorithm?
7. Explain Security payload?
8. Explain securirty socket layer?

MODEL QUESTION PAPER (Sem-end. Exam)

B. Sc DEGREE EXAMINATION

SEMESTER –V

Course 7B: Cyber Security

Time:3Hrs

Max.marks:75

Section - A

I. Answer all the following

5x10=50

1. A) What is Cybercrime and explain Information security?
(OR)
B) Discuss the global perspective on cybercrimes?
2. A) What is Cyber Stalking? Explain various types of Stalkers with a case study?
(OR)

- B) Define Social Engineering? Describe the classification of Social Engineering with examples?
3. A) Explain the trends in mobile credit card frauds in wireless computing
(OR)
B) Explain Organizational Measures for Handling Mobiles?
4. A) Explain about Trojan Horses and Backdoors in detail with examples.
(OR)
B) Differentiate between computer Virus and Worms with two examples each?
5. A) Explain about Digital Signatures?
(OR)
B) Explain Challenges to Indian Law and Cyber crimes Scenario?

Section - B

II. Answer any 5 from the following

5x5=25

1. What is Cyber Crime? List the types of cybercriminals.
2. Define the public key certificate
3. How to prevent SQL Injection Attacks?
4. How to prevent SQL Injection Attacks?
5. Explain about Phishing Attacks?
6. Explain information Blue Print?
7. Explain Information Security Policy Standards?
8. Explain Steganography?

MODEL QUESTION PAPER (Sem-end. Exam)

B. Sc DEGREE EXAMINATION

SEMESTER –V

Course – 6C Data Analytics Using R

Time:3Hrs

Max.marks:75

Section - A

I. Answer all the following

5x10=50

1. A) Explain Applications of Data Analytics?
(OR)
B) Explain Classifications of Data?
2. A) Explain the environment of R Language?
(OR)
B) Explain control statements of R Language?

3. A) Explain Reading and Getting Data from R Language?
(OR)
B) Explain Working with R charts and Graphs?
4. A) Explain Decision Tree with Example?
(OR)
B) Explain different types of Regression Models?
5. A) Explain briefly reinforcement learning
(OR)
B) Explain Creating data for analytics through active learning?

Section – B

II. Answer any 5 from the following

5x5=25

1. Explain Characteristics of Data?
2. What is Data Analytics?
3. Explain Data types of R?
4. Explain Boxplots, Bar Charts?
5. Explain Survival Analysis?
6. Explain Prescriptive Analytics ?
7. Explain Random Forest?
8. Explain Normal and Binomial distributions?

MODEL QUESTION PAPER (Sem-end. Exam)

B. Sc DEGREE EXAMINATION

SEMESTER –V

Course – 7C Data Ware Housing and Mining

Time:3Hrs

Max.marks:75

Section - A

I. Answer all the following

5x10=50

1. A) Explain briefly about Data Mining?
(OR)
B) Explain Major Issues in Data Mining?
2. A) Explain Data Preprocessing?
(OR)
B) Explain briefly Data Transformation and Data Discretization?
3. A) Explain Decision Tree Induction?

(OR)

B) Explain about Data Classification?

4. A) Explain Bayes Theorem?

(OR)

B) Explain Bayesian Belief Networks?

5. A) What is Association and Explain Association Analysis?

(OR)

B) Explain compact representation of frequent item sets?

Section - B

Answer any 5 from the following

5x5=25

1. What is Data Visualization?
2. Explain Data Cleaning?
3. Explain Data integration?
4. Explain Working of Decision Tree?
5. Explain Naive Bayesian Classification?
6. Explain Rule Generation?
7. Explain Market Basket Analysis?
8. Explain Applications of Data Mining?