ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI (AUTONOMOUS)

COMPUTER SCIENCE AND ENGINEERING

(Effective for the batches admitted in 2019-20)

II B. Tech – I Semester (Theory – 7, Lab – 3)

S. No	Category	Course Code	Course Title	Hours per week			Credits	Scheme of Examination (Max. Marks)		
				L	T	P		CIE	SEE	Total
THEORY										
1	BS	19ABS9921	Numerical Methods	3	0	0	3	30	70	100
2	ES	19AES0509	Basics of Python Programming	2	0	0	2	30	70	100
3	ES	19AES0104	Basic Civil & Mechanical Engineering	3	0	0	3	30	70	100
4	PC	19APC0501	Discrete Mathematics	3	0	0	3	30	70	100
5	PC	19APC0502	Database Management Systems	3	0	0	3	30	70	100
6	PC	19APC0503	Digital Logic Design	3	0	0	3	30	70	100
7	MC	19AMC9901	Biology for Engineers	2	0	0	0	30	-	30
PRACTICAL										
8	ES	19AES0510	Basics of Python Programming Lab	0	0	2	1	30	70	100
9	ES	19AES0105	Basic Civil & Mechanical Engineering Lab	0	0	3	1.5	30	70	100
10	PC	19APC0505	Database Management Systems Lab	0	0	4	2	30	70	100
TOTAL							21.5	300	630	930

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B.Tech II Year I Semester

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19ABS9921	Numerical Methods	3	0	0	3

Course Outcomes:

1. Analyze the concepts of Errors, Relative and Percentage Errors
2. Analyze the concepts of Algebraic & Transcendental Equations to solve different Engineering problems
3. Analyze Interpolation using the concepts of the Numerical Methods
4. Apply the concepts of Integration in Numerical Methods
5. Apply the concepts of O.D.E on Numerical Methods

Unit - I

Errors in Numerical computations: Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation.

UNIT – II

Solution of Algebraic and Transcendental Equations: The Bisection Method – The Method of False Position– Newton-Raphson Method, Solution of linear simultaneous equation:Crout's triangularisation method, Gauss - Seidal iteration method.

UNIT – III

Interpolation: Newton's forward and backward interpolation formulae – Lagrange's formulae. Gauss forward and backward formula, Stirling's formula, Bessel's formula.

UNIT – IV

Curve fitting: Fitting of a straight line – Second degree curve – Exponential curve-Power curve by method of least squares. Numerical Differentiation for Newton's interpolation formula. Numerical Integration: Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule.

UNIT –V

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method- Runge - Kutta Methods. Numerical solutions of Laplace equation using finite difference approximation.

TEXT BOOKS:

1. Higher Engineering Mathematics, B.S.Grewal, Khanna publishers.
2. Introductory Methods of Numerical Analysis, S.S. Sastry, PHI publisher.

REFERENCES:

1. Engineering Mathematics, Volume - II, E. Rukmangadachari Pearson Publisher.
2. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi, S.Ranganatham and M.V.S.S.N.Prasad, S.Chand publication.
3. Higher Engineering Mathematics, by B.V.Ramana, Mc Graw Hill publishers.
4. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Knowledge of Mathematics	1.2	1.2.1
CO2	PO1: Knowledge of Mathematics	1.2	1.2.1
CO3	PO1: Knowledge of Mathematics	1.2	1.2.1
CO4	PO1: Knowledge of Mathematics	1.2	1.2.1
CO5	PO1: Knowledge of Mathematics	1.2	1.2.1

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B.Tech II Year I Semester

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19AES0509	**Basics of Python Programming**	2	0	0	2

Course Objectives:

- To learn the fundamentals of Python
- To elucidate problem-solving using a Python programming language
- To introduce a function-oriented programming paradigm through python
- To get training in the development of solutions using modular concepts
- To introduce the programming constructs of python

Unit – I
Introduction: What is a program, Running python, Arithmetic operators, Value and Types.
Variables, Assignments and Statements: Assignment statements, Script mode, Order of operations, string operations, comments.
Functions: Function calls, Math functions, Composition, Adding new Functions, Definitions and Uses, Flow of Execution, Parameters and Arguments, Variables and Parameters are local, Stack diagrams, Fruitful Functions and Void Functions, Why Functions.

Unit – II
Case study: The turtle module, Simple Repetition, Encapsulation, Generalization, Interface design, Refactoring, docstring.
Conditionals and Recursion: floor division and modulus, Boolean expressions, Logical operators, Conditional execution, Alternative execution, Chained conditionals, Nested conditionals, Recursion, Infinite Recursion, Keyboard input.
Fruitful Functions: Return values, Incremental development, Composition, Boolean functions, More recursion, Leap of Faith, Checking types.

Unit – III
Iteration: Reassignment, Updating variables, The while statement, Break, Square roots, Algorithms.
Strings: A string is a sequence, len, Traversal with a for loop, String slices, Strings are immutable, Searching, Looping and Counting, String methods, The in operator, String comparison.
Case Study: Reading word lists, Search, Looping with indices.
Lists: List is a sequence, Lists are mutable, Traversing a list, List operations, List slices, List methods, Map filter and reduce, Deleting elements, Lists and Strings, Objects and values, Aliasing, List arguments.

Unit – IV
Dictionaries: A dictionary is a mapping, Dictionary as a collection of counters, Looping and dictionaries, Reverse Lookup, Dictionaries and lists, Memos, Global Variables.
Tuples: Tuples are immutable, Tuple Assignment, Tuple as Return values, Variable-length argument tuples, Lists and tuples, Dictionaries and tuples, Sequences of sequences.
Files: Persistence, Reading and writing, Format operator, Filename and paths, Catching exceptions, Databases, Pickling, Pipes, Writing modules.
Classes and Objects: Programmer-defined types, Attributes, Instances as Return values, Objects are mutable, Copying.

Unit – V
Classes and Functions: Time, Pure functions, Modifiers, Prototyping versus Planning
Classes and Methods: Object oriented features, Printing objects, The init method, The __str__method, Operator overloading, Type-based Dispatch, Polymorphism, Interface and Implementation
Inheritance: Card objects, Class attributes, Comparing cards, decks, Printing the Deck, Add Remove shuffle and sort, Inheritance, Class diagrams, Data encapsulation.
The Goodies: Conditional expressions, List comprehensions, Generator expressions, any and all, Sets, Counters, defaultdict, Named tuples, Gathering keyword Args.

Course Outcomes:
Student should be able to

1. Apply the features of Python language in various real applications.
2. Select appropriate data structure of Python for solving a problem.
3. Design object oriented programs using Python for solving real-world problems.
4. Apply modularity to programs.

Text books:
1. Allen B. Downey, “Think Python”, 2nd edition, SPD/O’Reilly, 2016.

Reference Books:
1. Martin C.Brown, “The Complete Reference: Python”, McGraw-Hill, 2018.
2. Kenneth A. Lambert, B.L. Juneja, “Fundamentals of Python”, CENGAGE, 2015.
3. R. Nageswara Rao, “Core Python Programming”, 2nd edition, Dreamtech Press, 2019

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Engineering Knowledge	1.4	1.4.1
CO2	PO2: Problem Analysis	2.3	2.3.1
CO3	PO2: Problem Analysis	2.4	2.4.2
CO4	PO2: Problem Analysis	2.2	2.2.3

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B.Tech II Year I Semester

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19AES0104	Basic Civil & Mechanical Engineering	3	0	0	3

Course Outcomes:

CO 1: understand principles of Stress and Strain
CO 2: understand basic principles of Strain Measurement and apply the concepts of Strain Rosettes for strain measurement.
CO 3: understand common building materials used in construction and analyze characteristics of common building materials.
CO 4: Apply velocity ratio concepts in power transmission.
CO 5: Understand the principles of CAD, CAM & CIM.

PART – A

UNIT – I:
Basic Definitions of Force – Stress – Strain – Elasticity. Shear force – Bending Moment – Torsion. Simple problems on Shear force Diagram and Bending moment Diagram for cantilever
and simply supported beams.

UNIT – II:
Measurement of Strain - Electrical Capacitance and Resistance Strain gauges – multi channel strain indicators. Rosette analysis – Rectangular and Triangular strain rosettes – Wheatstone bridge.

UNIT – III:
Characteristics of common building materials – Brick – Types – Testing; Timber – Classification
– Seasoning – Defects in Timber; Glass – Classification – uses; steel and its applications in Construction Industry.

PART – B

UNIT – IV: Power Plants
Classification of Power plants – Steam Power Plants – Nuclear Power Plants – Gas turbines – Hydro Power Plants – Solar energy – wind energy – Tidal Power – Geo Thermal Power.

UNIT – V: Transmission of Power
Transmission of Power – Belt and Rope Drives – Types of Belts – Materials – Velocity ratio – Speed Ratio – Rope Drives – V-Belt – Flat Belt.

UNIT – VI: Computer Aided Design & Manufacturing
Introduction to engineering applications of computer aided design – Computer Aided Drawing – Advantages of CAD – Computer Aided Manufacturing – Functions of Robots in manufacturing Applications – advantages of Robots – Computer integrated Manufacturing (CIM).

Text Books:

1. Shanmugam G and Palanichamy M S, “Basic Civil and Mechanical Engineering”, Tata McGraw Hill Publishing Co., New Delhi.
2. Ramamrutham S., “Basic Civil Engineering”, Dhanpat Rai Publishing Co. (P) Ltd.

References:

1. S.Trymbaka Murthy., “Computer Aided Engineering Drawing” , Universities Press
2. Seetharaman S., “Basic Civil Engineering”, Anuradha Agencies.
3. Venugopal K. and Prahu Raja V., “Basic Mechanical Engineering”, Anuradha Publishers, Kumbakonam.
4. Er. R. Vaishnavi, Basic Civil and Mechanical Engineering, 2/e, S. Chand Publications

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Engineering knowledge	1.2	1.2.1
		1.3	1.3.1
		1.4	1.4.1
	PO2: Problem analysis	2.2	2.2.1
		2.3	2.3.1
CO2	PO1: Engineering knowledge	1.2	1.2.1
		1.3	1.3.1
		1.4	1.4.1
	PO2: Problem analysis	2.2	2.2
		2.3	2.3.1
CO3	PO1: Engineering knowledge	1.2	1.2.1
		1.3	1.3.1
		1.4	1.4.1
	PO2: Problem analysis	2.2	2.2.1
		2.3	2.3.1
CO 4	PO1: Engineering knowledge	1.2	1.2.1

		1.3	1.3.1
CO 5	PO1: Engineering knowledge	1.2	1.2.1
	PO2: Problem analysis	1.3	1.3.1
		1.4	1.4.1

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B.Tech II Year I Semester

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19APC0501	Discrete Mathematics	3	0	0	3

Course Objectives

- Understand the methods of discrete mathematics such as proofs, counting principles, number theory, logic and set theory.
- Understand the concepts of graph theory, binomial theorem, and generating function in analysis of various computer science applications.

UNIT I : Mathematical Logic:
Introduction, Connectives, Normal Forms, The theory of Inference for the Statement Calculus, The Predicate Calculus, Inference Theory of Predicate Calculus.

UNIT II: SET Theory:
Basic concepts of Set Theory, Representation of Discrete structures, Relations and Ordering, Functions, Recursion.

UNIT III: Algebraic Structures:
Algebraic Systems: Examples and General Properties, Semi groups and Monoids, Polish expressions and their compilation, Groups: Definitions and Examples, Subgroups and Homomorphism's, Group Codes.
Lattices and Boolean algebra: Lattices and Partially Ordered sets, Boolean algebra.

UNIT IV: An Introduction to Graph Theory:
Definitions and Examples, Sub graphs, complements, Graph Isomorphism, Vertex Degree: Euler Trails and Circuits, Planar Graphs, Hamilton Paths and Cycles, Graph Coloring and Chromatic Polynomials
Trees: Definitions, Properties, Examples, Rooted Trees, Trees and Sorting, Weighted trees and Prefix Codes, Biconnected Components and Articulation Points.

UNIT V: Fundamental Principles of Counting:
The rules of Sum and Product, Permutations, Combinations: The Binomial Theorem, Combinations with Repetition.
The Principle of Inclusion and Exclusion: The Principle of Inclusion and Exclusion, Generalizations of Principle, Derangements: Nothing is in Its Right Place, Rook Polynomials and arrangements with Forbidden Positions.
Generating Functions: Introductory Examples, Definitions and Examples: Calculation Techniques, Partitions of Integers, the Exponential Generating Functions, The Summation Operator.

TEXT BOOKS:

1. Discrete Mathematics and Its Applications [7th Edition] Kenneth H. Rosen
2. "Discrete Mathematical Structures with Applications to Computer Science", J.P. Tremblay and R. Manohar, Mc Graw Hill Education, 2015.
3. "Discrete and Combinatorial Mathematics, an Applied Introduction", Ralph P. Grimaldi and B.V.Ramana, Pearson, 5th Edition, 2016.

REFERENCE BOOKS:

1. Graph Theory with Applications to Engineering by NARSINGH DEO, PHI.
2. Discrete Mathematics by R.K.Bishtand H.S. Dhami, Oxford Higher Education.
3. Discrete Mathematics theory and Applications by D.S.Malik and M.K.Sen, Cenegage Learning.
4. Elements of Discrete Mathematics, A computer Oriented approach by C L Liu and D P Mohapatra, MC GRAW HILL Education.
5. Discrete Mathematics for Computer scientists and Mathematicians by JOE L.Mott, Abraham Kandel and Theodore P.Baker, Pearson ,2nd Edition

Course Outcomes

1. Understand basics of Mathematical Logic
2. Understand the properties of Compatibility, Equivalence and Partial Ordering relations, Lattices
3. Understand the general properties of Algebraic Systems, Semi Groups, Monoids and Groups.
4. Design solutions for problems using Graphs
5. Understand the fundamental principles of counting

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO1: Engineering Knowledge	1.3	1.3.1
CO2	PO2: Problem Analysis	2.1	2.1.3
CO3	PO2: Problem Analysis	2.1	2.1.3
CO4	PO2: Problem Analysis	2.3	2.3.1
CO5	PO1: Engineering Knowledge	1.3	1.3.1

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B.Tech II Year I Semester

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19APC0502	DATABASE MANAGEMENT SYSTEMS	3	0	0	3

Objectives:

- To understand the basic concepts and the applications of database systems.
- To master the basics of SQL and construct queries using SQL.
- To understand the relational database design principles.
- To become familiar with the basic issues of transaction processing and concurrency control.
- To become familiar with database storage structures and access techniques.

UNIT-I

Introduction-Database System Applications, Purpose of Database Systems, View of Data - Data Abstraction, Instances and Schemas, Data Models, Database Languages - DDL, DML, Database Architecture, Database Users and Administrators, History of Data base Systems.
Introduction to Data base design , ER diagrams, Beyond ER Design, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises. Relational Model: Introduction to the Relational Model - Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design, Introduction to Views Destroying/ altering Tables and Views.

UNIT-II

Relational Algebra and Calculus: Relational Algebra - Selection and Projection, Set operations, Renaming, Joins, Division, Examples of Algebra Queries, Relational calculus - Tuple relational Calculus - Domain relational calculus - Expressive Power of Algebra and calculus.
Form of Basic SQL Query - Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries, Set - Comparison Operators, Aggregate Operators, NULL values - Comparison using Null values - Logical connectives - AND, OR and NOT - Impact on SQL Constructs, Outer Joins, Disallowing NULL values, Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT-III

Introduction to Schema Refinement - Problems Caused by redundancy, Decompositions - Problem related to decomposition, Functional Dependencies - Reasoning about FDS, Normal Forms - FIRST, SECOND, THIRD Normal forms - BCNF - Properties of Decompositions - Loss less join Decomposition, Dependency preserving Decomposition, Schema Refinement in Data base Design - Multi valued Dependencies - FOURTH Normal Form, Join Dependencies, FIFTH Normal form, Inclusion Dependencies.

UNIT-IV

Transaction Management - Transaction Concept - Transaction State - Implementation of Atomicity and Durability - Concurrent - Executions - Serializability - Recoverability - Implementation of Isolation - Testing for serializability.
Concurrency Control - Lock - Based Protocols - Timestamp Based Protocols - Validation - Based Protocols - Multiple Granularity.
Recovery System-Failure Classification-Storage Structure-Recovery and Atomicity - Log - Based Recovery - Recovery with Concurrent Transactions - Buffer Management - Failure with loss of nonvolatile storage - Advance Recovery systems - Remote Backup systems.

UNIT-V

Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing - Clustered Indexes, Primary and Secondary Indexes, Index data Structures - Hash Based Indexing, Tree based Indexing, Comparison of File Organizations.
Tree Structured Indexing: Intuitions for tree indexes, Indexed Sequential Access Methods(ISAM) B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.
Hash Based Indexing: Static Hashing, Extendable hashing, Linear Hashing, Extendible vs. Linear Hashing.

TEXT BOOKS:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, McGrawHill Education, 3rd Edition, 2003.
2. Data base System Concepts, A.Silberschatz, H.F. Korth, S.Sudarshan, McGraw Hill, VI edition, 2006.

REFERENCES:

1. Database Systems, 6th edition, Ramez Elmasri, Shamkat B. Navathe, Pearson Education, 2013.
2. Database Systems Concepts, Peter Rob & Carlos Coronel, Cengage Learning, 2008.
3. Introduction to Database Systems, C.J. Date, Pearson Education.
4. Database Management Systems, G.K. Gupta, McGrawHill Education.

Course Outcomes:

1. Demonstrate the basic elements of a relational database management system,
2. Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respective data.
3. Apply normalization for the development of application software.
4. Define Transactions which preserve the integrity of database
5. Ability to understand Storage and Indexing Techniques

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO1	PO3: Design of Solutions	3.1	3.1.3
CO2	PO3: Design of Solutions	3.1	3.1.3
CO3	PO3: Design of Solutions	3.3	3.3.1
CO4	PO4: Conduct investigations of complex problems	4.2	4.2.1
CO5	PO3: Design of Solutions	3.4	3.4.1

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COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19APC0503	**Digital Logic Design**	**3**	**0**	**0**	**3**

Course Objectives:

1. To understand number representation and conversion between different representation in digital electronic circuits.
2. To analyze logic processes and implement logical operations using combinational logic circuits.
3. To understand characteristics of memory and their classification.
4. To understand concepts of sequential circuits and to analyze sequential systems in terms of state machines.
5. To understand concept of Programmable Devices and PLA

UNIT I

BINARY SYSTEMS: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Compliments, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates, Integrated Circuits.

UNIT II

GATE – LEVEL MINIMIZATION: The Map Method, Four Variable Map, Five-Variable Map, Product of Sums Simplification, Don't-Care Conditions, NAND and NOR Implementation, Other Two Level Implementations, EX-OR Function, Other Minimization Methods

UNIT III

COMBINATIONAL LOGIC: Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT IV

SYNCHRONOUS SEQUENTIAL LOGIC: Sequential Circuits, Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Design Procedure, Registers, Shift Registers, Ripple Counters, Synchronous Counters, Other counters.

UNIT V

MEMORY AND PROGRAMMABLE LOGIC: Random access memory, memory decoding, Error Detection and Correction, Read-only Memory, Programmable Logic Array, Programmable Array Logic.

DIGITAL LOGIC CIRCUITS: RTL and DTL Circuits, Transistor-Transistor Logic (TTL), Emitter-Coupled Logic (ECL), MOS, CMOS Logic, Comparisons of Logic Families.

TEXT BOOKS:

1. Digital Design, M.Morris Mano & Michael D. Ciletti, Pearson, 6th Edition, 2018.
2. Digital Logic & State Machine Design, David J. Comer, Oxford University Press, 3rd Reprinted Indian Edition, 2012.

REFERENCES:

1. Digital Logic Design, R.D. Sudhakar Samuel, Elsevier
2. Fundamentals of Logic Design, 5/e, Roth, Cengage
3. Switching and Finite Automata Theory,3/e,Kohavi, Jha, Cambridge.
4. Digital Logic Design, Leach, Malvino, Saha,TMH
5. Modern Digital Electronics, R.P. Jain, TMH

Course Outcomes

1. Develop a digital logic and apply it to solve real life problems.
2. Analyze, design and implement combinational logic circuits.
3. Classify different semiconductor memories.
4. Analyze, design and implement sequential logic circuits.
5. Analyze digital system design using PLA.

List of COs	**PO no. and keyword**	**Competency Indicator**	**Performance Indicator**
CO1	PO2: Problem Analysis	2.1	2.1.3
CO2	PO2: Problem Analysis	2.2	2.2.2
CO3	PO2: Problem Analysis	2.2	2.2.4
CO4	PO2: Problem Analysis	2.2	2.2.2
CO5	PO2: Problem Analysis	2.2	2.2.2

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COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19AMC9901	Biology for Engineers	2	0	0	0

Course Outcomes:

CO: 1	Explain about cells and their structure and function. Different types of cells and basics for classification of living Organisms.
CO: 2	Explain about biomolecules, their structure, function and their role in the living organisms. How biomolecules are useful in Industry.
CO: 3	Brief about human physiology.
CO: 4	Explain about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms.
CO: 5	Know about application of biological principles in different technologies for the production of medicines and pharmaceutical molecules through transgenic microbes, plants and animals

UNIT I

Evolution: Different patterns of evolution, Darwin's theory of evolution, Cell as Basic unit of life, cell theory, Cell shapes, Cell structure, Cell cycle. Chromosomes. Prokaryotic and eukaryotic Cell. Plant Cell, Animal Cell, Plant tissues and Animal tissues, Brief introduction to five kingdoms of classification, Tissue Engineering.

UNIT II

Carbohydrates, lipids, proteins, Vitamins and minerals, Nucleic acids (DNA and RNA) and their types. Enzymes, Enzyme application in Industry. Large scale production of enzymes by Fermentation.

UNIT III

Digestive system, Respiratory system, (aerobic and anaerobic Respiration). Respiratory organs, respiratory cycle, Central Nerves System and Excretory system.

UNIT IV

Prokaryotic gene and Eukaryotic gene structure.DNA replication, Transcription and Translation. DNA technology. Introduction to gene cloning.

UNIT V

Brief introduction to industrial Production of Enzymes, Pharmaceutical and therapeutic Proteins, Vaccines and antibodies. Basics of biosensors, Properties and Classification of virus, Immune response to virus, Definitions-Pandemic, Epidemic and outbreak, pandemic alert system ranges, Prevention of pandemic disease and pandemic preparation.

TEXT BOOKS :

1. P.K.Gupta, Cell and Molecular Biology, 5th Edition, Rastogi Publications.
2. U. Satyanarayana. Biotechnology, Books & Allied Ltd 2017.

REFERENCE BOOKS :

1. N. A. Campbell, J. B. Reece, L. Urry, M. L. Cain and S. A. Wasserman, "Biology: A Global Approach", Pearson Education Ltd, 2018.
2. T Johnson, Biology for Engineers, CRC press, 2011
3. J.M. Walker and E.B. Gingold, Molecular Biology and Biotechnology 2nd ed.. Panima Publications. PP 434.
4. David Hames, Instant Notes in Biochemistry –2016
5. Phil Tunner, A. Mctennan, A. Bates & M. White, Instant Notes – Molecular Biology – 2014.
6. Richard Dawkins, River Out of Eden: A Darwinian View of LifeFluid Mechanics and Machinery by D.RamaDurgaiah, New Age International.

List of COs	PO no. and keyword	Competency Indicator	Performance Indicator
CO: 1	PO1:Apply the knowledge of basic science	1.2	1.2.1
CO: 2	PO1:Apply the knowledge of basic science	1.2	1.2.1
CO: 3	PO1:Apply the knowledge of basic science	1.2	1.2.1
CO: 4	PO1:Apply the knowledge of basic science	1.2	1.2.1
CO: 5	PO1:Apply the knowledge of basic science	1.2	1.2.1

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COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19AES0510	Basics of Python Programming Lab	0	0	2	1

Course Objectives:

- To train the students in solving computational problems
- To elucidate solving mathematical problems using Python programming language
- To understand the fundamentals of Python programming concepts and its applications.
- To understand the object-oriented concepts using Python in problem solving.

Laboratory Experiments

1. Install Python Interpreter and use it to perform different Mathematical Computations. Try to do all the operations present in a Scientific Calculator

2. Write a function that draws a grid like the following:

```
+ - - - - + - - - - +
|         |         |
|         |         |
|         |         |
|         |         |
+ - - - - + - - - - +
|         |         |
|         |         |
|         |         |
|         |         |
+ - - - - + - - - - +
```

3. Write a function that draws a Pyramid with # symbols

```
                              #
                 #            #        #
              #        #      #      #    #
            #    #        #   #   #    #     #
```

Up to 15 hashes at the bottom

4. Using turtles concept draw a wheel of your choice

5. Write a program that draws Archimedean Spiral

6. The letters of the alphabet can be constructed from a moderate number of basic elements, like vertical and horizontal lines and a few curves. Design an alphabet that can be drawn with a minimal number of basic elements and then write functions that draw the letters. The alphabet can belong to any Natural language excluding English. You should consider at least Ten letters of the alphabet.

7. The time module provides a function, also named time that returns the current Greenwich Mean Time in “the epoch”, which is an arbitrary time used as a reference point. On UNIX systems, the epoch is 1 January 1970.

```
>>> import time
>>> time.time()
1437746094.5735958
```

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.

8. Given n+r+1 <= 2r . n is the input and r is to be determined. Write a program which computes minimum value of r that satisfies the above.

9. Write a program that evaluates Ackermann function

10. The mathematician Srinivasa Ramanujan found an infinite series that can be used to generate a numerical approximation of 1/ **π** :

Write a function called estimate_pi that uses this formula to compute and return an estimate of **π.**

$$\frac{1}{\pi} = \frac{2\sqrt{2}}{9801} \sum_{k=0}^{\infty} \frac{(4k)!(1103 + 26390k)}{(k!)^4 396^{4k}}$$

It should use a while loop to compute terms of the summation until the last term is smaller than 1e^{-15} (which is Python notation for 10 $^{-15}$). You can check the result by comparing it to math.pi.

11. Choose any five built-in string functions of C language. Implement them on your own in Python. You should not use string related Python built-in functions.

12. Given a text of characters, Write a program which counts number of vowels, consonants and special characters.

13. Given a word which is a string of characters. Given an integer say ‘n’, Rotate each character by ‘n’ positions and print it. Note that ‘n’ can be positive or negative.

14. Given rows of text, write it in the form of columns.

15. Given a page of text. Count the number of occurrences of each latter (Assume case insensitivity and don’t consider special characters). Draw a histogram to represent the same

16. Write program which performs the following operations on list’s. Don’t use built-in functions

a) Updating elements of a list
b) Concatenation of list’s
c) Check for member in the list
d) Insert into the list
e) Sum the elements of the list
f) Push and pop element of list
g) Sorting of list
h) Finding biggest and smallest elements in the list
i) Finding common elements in the list

17. Write a program to count the number of vowels in a word.

18. Write a program that reads a file, breaks each line into words, strips whitespace and punctuation from the words, and converts them to lowercase.
19. Go to Project Gutenberg (http://gutenberg.org) and download your favorite out-of-copyright book in plain text format. Read the book you downloaded, skip over the header information at the beginning of the file, and process the rest of the words as before. Then modify the program to count the total number of words in the book, and the number of times each word is used. Print the number of different words used in the book. Compare different books by different authors, written in different eras.
20. Go to Project Gutenberg (http://gutenberg.org) and download your favorite out-of-copyright book in plain text format. Write a program that allows you to replace words, insert words and delete words from the file.
21. Consider all the files on your PC. Write a program which checks for duplicate files in your PC and displays their location. Hint: If two files have the same checksum, they probably have the same contents.
22. Consider turtle object. Write functions to draw triangle, rectangle, polygon, circle and sphere. Use object oriented approach.
23. Write a program illustrating the object oriented features supported by Python.
24. Design a Python script using the Turtle graphics library to construct a turtle bar chart representing the grades obtained by N students read from a file categorizing them into distinction, first class, second class, third class and failed.
25. Design a Python script to determine the difference in date for given two dates in YYYY:MM:DD format(0 <= YYYY <= 9999, 1 <= MM <= 12, 1 <= DD <= 31) following the leap year rules.
26. Design a Python Script to determine the time difference between two given times in HH:MM:SS format.(0 <= HH <= 23, 0 <= MM <= 59, 0 <= SS <= 59)

Reference Books:

1. Peter Wentworth, Jeffrey Elkner, Allen B. Downey and Chris Meyers, "How to Think Like a Computer Scientist: Learning with Python 3", 3rd edition,
2. Available at http://www.ict.ru.ac.za/Resources/cspw/thinkcspy3/thinkcspy3.pdf
3. Paul Barry, "Head First Python a Brain Friendly Guide" 2nd Edition, O'Reilly, 2016
4. Dainel Y.Chen "Pandas for Everyone Python Data Analysis" Pearson Education, 2019

Lab Outcomes:
Student should be able to
1. Design solutions to mathematical problems.
2. Organize the data for solving the problem.
3. Develop Python programs for numerical and text based problems.
4. Select appropriate programming construct for solving the problem.
5. Illustrate object oriented concepts.

List of COs	**PO no. and keyword**	**Competency Indicator**	**Performance Indicator**
CO1	PO1: Engineering Knowledge	1.4	1.4.1
CO2	PO3: Design/Development of Solutions	3.3	3.3.1
CO3	PO2: Problem analysis	2.3	2.3.1
CO4	PO2: Problem analysis	2.3	2.3.1
CO5	PO1: Engineering Knowledge	1.3	1.3.1

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)

B.Tech II Year I Semester

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19AES0102	**Basic Civil & Mechanical Engineering Lab**	**0**	**0**	**3**	**1.5**

Course Outcomes:

CO 1: understand principles of Bending Stress and Strain and
CO 2: understand basic principles of Strain Measurement
CO 3: understand common building materials used in construction and analyze charactestics of common building materials.

PART – A

Laboratory Experiments:

1. Bending test on (Steel/Wood) Cantilever beam.
2. Bending test on (Steel/Wood) simply supported beam.
3. Use of electrical resistance strain gauges.
4. Compression test on Bricks
5. Water absorption test on Bricks
6. Torsion test.
7. Tests on closed coiled and open coiled helical springs

List of COs	PO no. and keyword	Competency Indicator:	Performance Indicator:
CO1	PO1: Engineering knowledge	1.2	1.2.1
		1.3	1.3.1
		1.4	1.4.1
	PO2: Problem analysis	2.2	2.2.1
		2.3	2.3.1
CO2	PO1: Engineering knowledge	1.2	1.2.1
		1.3	1.3.1
		1.4	1.4.1
	PO2: Problem analysis	2.2	2.2
		2.3	2.3.1
CO3	PO1: Engineering knowledge	1.2	1.2.1
		1.3	1.3.1
		1.4	1.4.1
	PO2: Problem analysis	2.2	2.2.1
		2.3	2.3.1

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI
(AUTONOMOUS)

B.Tech II Year I Semester

COURSE CODE	COURSE TITLE	L	T	P	CREDITS
19APC0505	Database Management Systems Lab	0	0	4	2

Course Objectives:
To create a database and query it using SQL, design forms and generate reports.
Understand the significance of integrity constraints, referential integrity constraints, triggers, assertions.

List of Experiments:

```
SQL> CREATE TABLE emp (
  empno decimal(4,0) NOT NULL,   ename varchar(10) default NULL,
  job varchar(9) default NULL,    mgr decimal(4,0) default NULL,
  hiredate date default NULL,   sal decimal(7,2) default NULL,
  comm decimal(7,2) default NULL,   deptno decimal(2,0) default NULL );

SQL> DESC emp;

SQL> CREATE TABLE dept (
  deptno decimal(2,0) default NULL,   dname varchar(14) default NULL,
  loc varchar(13) default NULL );

SQL>
INSERT INTO emp VALUES (7369,'SMITH','CLERK',7902,'17-DEC 1980’,800.00,NULL,20);
INSERT INTO emp VALUES (7499,'ALLEN','SALESMAN',7698,'20-FEB-1981’, 1600.00, 300.00, 30);
INSERT INTO emp VALUES (7521,'WARD','SALESMAN',7698,'22-FEB- 1981’, 1250.00, 500.00, 30');
INSERT INTO emp VALUES (7566,'JONES','MANAGER',7839,'02-APR-1981’,2975.00,NULL,20);
INSERT INTO emp VALUES (7654,'MARTIN','SALESMAN',7698,'1981-09-28',1250.00,1400.00, 30);
INSERT INTO emp VALUES (7698,'BLAKE','MANAGER',7839,'1981-05-01',2850.00,NULL,30);
INSERT INTO emp VALUES (7782,'CLARK','MANAGER',7839,'1981-06-09',2450.00,NULL,10);
INSERT INTO emp VALUES (7788,'SCOTT','ANALYST',7566,'1982-12-09',3000.00,NULL,20);
INSERT INTO emp VALUES (7839,'KING','PRESIDENT',NULL,'1981-11-17',5000.00,NULL,10);
INSERT INTO emp VALUES (7844,'TURNER','SALESMAN',7698,'1981-09-08',1500.00,0.00,30);
INSERT INTO emp VALUES (7876,'ADAMS','CLERK',7788, 'DEC-01-1983',1100.00,NULL,20);
INSERT INTO emp VALUES (7900,'JAMES','CLERK',7698, 'DEC-03-1981',950.00,NULL,30);
INSERT INTO emp VALUES (7902,'FORD','ANALYST',7566,'DEC-03-1981',3000.00,NULL,20);
INSERT INTO emp VALUES (7934,'MILLER','CLERK',7782,’JAN-23-1982’,1300.00,NULL,10);

SQL> INSERT INTO dept VALUES ('10','ACCOUNTING','NEW YORK');
INSERT INTO dept VALUES ('20','RESEARCH','DALLAS');
INSERT INTO dept VALUES ('30','SALES','CHICAGO');
INSERT INTO dept VALUES ('40','OPERATIONS','BOSTON');
```

1. List all records from the emp table
2. List all records from the dept table
3. List all employee names along with their salaries from emp table
4. List all department numbers, employee numbers and their manager’s numbers in that order from emp table.
5. List department names and locations from the dept table.
6. List the employees belonging to the department 20
7. List the name and salary of the employees whose salary is more than 1000
8. List employee number and name of managers
9. List the names of the clerks working in the department 20
10. List the names of analysts and salesmen
11. List the details of the employees who have joined before the end of September 1981
12. List the name of employees who are not managers
13. List the name of the employees whose employee numbers are 7369, 7521, 7839, 7934, 7788
14. List the employee details not belonging to the department 10, 30 and 40
15. List the employee name and salary, whose salary is between 1000 and 2000
16. List employee names who have joined before 30th June 1981 and after December1981
17. List the different jobs (designations) available in emp table
18. List the employee names who are not eligible for commission
19. List the name of the employee and job of the employee who does not report to anybody (managers is NULL)
20. List the employees not assigned to any department
21. List the employees who are eligible for commission
22. List the details of employees whose salary is greater than 2000 and commission is null.
23. List the employees whose names start with an “S”
24. List the employees whose names ending with “S”
25. List the names of employees whose names have exactly 5 characters
26. List the employee names having ‘I’ as the second character
27. List the name, salary and PF amount of all the employees (PF is calculated as 10% of salary)
28. List the names of employees who are more than 25 years old in the organization
29. List the empno, ename, sal in ascending order of salary
30. List the empno, ename, sal, hiredate in descending order of hiredate.
31. List the employee name, Salary, job and department no. in ascending order of deptno and then on descending order of salary
32. List the employee details in ascending order of salary
33. List the employee name, salary, PF, HRA, DA and gross; order the result in ascending order of gross. HRA is 50% of salary and DA is 30% of salary
34. List the number of employees working with the company
35. List the number of jobs available in the emp table

36. List the total salaries payable to employees
37. List the maximum salary of employees working as a salesman
38. List the minimum salary from emp table
39. List the average salary and number of employees working in the department 20
40. List the deptno(s) and number of employees in each department
41. List the department number and the total salary payable in each department
42. List the jobs and the number of employees in each job. The result should be in descending order of the number of employees:
43. List the total salary, maximum, minimum and the average salary of employees job wise
44. List the average salary from each job excluding managers
45. List the total salary, maximum, minimum and the average salary of employees job-wise, for department number 20 only
46. List the average salary for each job type within department
47. List average salary for all departments employing more than five people
48. List jobs of all the employees where maximum salary is >= 5000
49. List the total salary, maximum, minimum and the average salary of employees jobwise, for department number 20 only and display only those rows having average salary greater than 1000
50. For the above query, the output should be arranged in the ascending order of SUM(sal)
51. List the deptno(s) and names in department name order.
52. List the details of employees in departments 10 and 20 in alphabetical order of name
53. List names and jobs of all clerks in department 20 in alphabetical order of name
54. List the names of all employees who have LL and LT in their names
55. List names and total remuneration for all employees
56. List name, annual salary and commission of all salespeople whose monthly salary is greater than their commission, the output should be ordered by salary, highest first. If two or more employees have the same salary sort by employee name within the highest salary order
57. List lowest paid employees working for each manager, sort the output by salary
58. List the employee numbers, names, department numbers and the department name
59. List all the employees who joined the company before their manager
60. Display the different designations in department 20 and 30
61. Display empno, ename from emp where deptno is 10 and 30 in ascending order of empno
62. List the jobs common to department 20 and 30
63. List the jobs unique to department 20
64. List the employees belonging to the department of MILLER
65. List the name of employee who draws the highest salary
66. List all employee details of an employee whose salary is greater than the average salary of employees whose hiredate is before '01-APR-1981'
67. List the job with highest average salary
68. Find the details of the department whose manager's empno is 7698
69. List the names of the employees who earn lowest salary in each department
70. List employee details who earn salary greater than the average salary
71. List all employees who have at least one person reporting to them
72. List the employee details iff more than 2 employees are present in deptno 10
73. List all the employee details who do not manage any one
74. List the employee names whose salary is greater than the lowest salary of an employee belonging to deptno 20
75. List the employee details of those employees whose salary is greater than any of the managers
76. List the employee names whose salary is greater than the highest salary of all employee belonging to dept 20
77. List the employee details of those employees whose salary is more than the highest paid manager
78. List all employees, their job and deptno, who are having same job as that of any employee of deptno 20
79. Using self join, list all the employees who have joined before their manager
80. List all employees who earn less than the average salary of all the employees
81. List all employees name along with their manager's name.
82. Also list the name of employee who has no manager
83. Display the dept that has no employee
84. List the employee details who earn minimum salary for their job
85. List the ename, sal, deptno for those employees who earn sal greater than the avg sal of their dept. Sort the output in deptno order
86. List the employee details who earn highest salary for their job
87. List the details of those employees who are among the five highest earners of the company
88. To increase everyone's salary by 40%
89. Change the department of King to 40
90. All employees who have more than 2 people reporting to them, are to directly report to the PRESIDENT
91. Delete all records from emp
92. Delete the records of clerks
93. To add a column "experience" to the employee table
94. To drop the column "location" from the employee table
95. To modify the column salary in the employee table WITH NUMBER (15,2)
96. Add a column to the existing table emp, which will hold the grades for each employee
97. Modify the emp table, add a Primary Key constraint 'emp_c'
98. Modify the emp table, add constraint REFERENCES to deptno of table emp referring deptno of table dept
99. Modify the emp table, add constraint CHECK for sal of table emp where sal should be greater than 2500
100. Modify the sal column of the emp table to NOT NULL and increases its size to 10
101. Modify the ename column. Increase its width to varchar2(35)
102. To change the name of the table employee to my_employee

Arithmetic Functions, string functions, and DATE Functions in SQL

2. SQL Queries on Sailors, Boats and Reserves

1. Create Table: Sailors

Field Name	Not Null	Datatype
Sid	primary key	integer
Sname		varchar2(20)
Rating		integer

Age		decimal(4,1)

2. Create Table: Boats

Field Name	Not Null	Datatype
Bid	Primary Key	integer
Bname		varchar2(20)
Color		varchar2(20)

3. Create Table: Reserves

Field Name	Not Null	Datatype
Sid	primary key, Foreign key(Sailors)	integer
Bid	primary key, Foreign key(Boats)	integer
Day	primary key	date

4. Insert data in to sailors

Sid	Sname	Rating	Age
22	DUSTIN	7	45.0
29	BRUTUS	1	33.0
31	LUBBER	8	55.5
32	ANDY	8	25.5
58	RUSTY	10	35.0
64	HORATIO	7	35.0
71	ZORBA	10	16.0
74	HORATIO	9	35.0
85	ART	3	25.5
95	BOB	3	63.5

5. Insert records in to Boats

Bid	Bname	Color
101	INTERLAKE	BLUE
102	INTERLAKE	RED
103	CLIPPER	GREEN
104	MARINE	RED

6. Insert records in to Reserves

Sid	Bid	Day
22	101	10-OCT-98
22	102	10-OCT-98
22	103	8-OCT-98
22	104	7-OCT-98
31	102	10-NOV-98
31	103	6-NOV-98
31	104	12-NOV-98
64	101	5-SEP-98
64	102	8-SEP-98
74	103	8-SEP-98

```
insert into Sailors (sid,sname,rating,age) REM values(131,'Lubber',8,55.5);
insert into Reserves(sid,bid,day) values(131,101,'8-OCT-98');
```

- "Find the names of sailors who have reserved boat number 103"
- "Find the names of sailors who have never reserved boat number 103"
- "Find the names of sailors who have reserved a red boat"
- "Find the colors of boats reserved by Lubber"
- "Find the names of sailors who have reserved at least one boat"
- "Find the names of sailors who have reserved a red or a green boat"
- "Find the names of sailors who have reserved both a red and a green boat"
- "Find the names of sailors who have reserved a red but not a green boat"
- "Find the names of sailors who have reserved at least two different boats"
- "Find the names of sailors who have reserved at least n boats"
- “Find the sids of sailors with age over 20 who have not reserved a red boat"
- "Find the names of sailors who have reserved all boats"
- "Find the names of sailors who have reserved all boats called Interlake"
- “Find all sailors with a rating above 7"
- "Find the names and ages of sailors with a rating above 7"
- "Find the sailor name boat id and reservation date for each reservation"
- "Find sailors who have reserved all red boats"
- "Find the names and ages of all sailors"
- "Find the sids of sailors who have reserved a red boat"
- "Compute increments for the ratings of persons who have sailed two different boats on the same day"
- “Find the ages of sailors whose name begins and ends with B and has at least three characters”
- “Find the sids of all sailors who have reserved red boats but not green boats”
- "Find all sids of sailors who have a rating of 10 or have reserved boat 104"
- "Find the names of sailors who have not reserved a red boat"
- "Find sailors whose rating is better than some sailor called Horatio"
- "Find sailors whose rating is better than every sailor called Horatio"
- "Find the sailors with the highest rating"

- "Find the average of all sailors"
- "Find the average age of sailors with a rating of 10"
- "Find the name and age of the oldest sailor"
- "Count the number of sailors"
- "Count the number of different sailor names"
- "Find the names of sailors who are older than the oldest sailor with a rating of 10"
- "Find the age of the youngest sailor for each rating level"
- "Find the age of the youngest sailor who is eligible to vote(i.e., is at least 18 years old) for each rating level with at least two such sailors"
- "For each red boat, find the number of reservations for this boat"
- "Find the average age of sailors for each rating level that has at least two sailors"
- "Find the average age of sailors who are of voting age(i.e., at least 18 years old) for each rating level that has at least two sailors"
- "Find the average age of sailors who are of voting age(i.e., at least 18 years old) for each rating level that has at least two such sailors"
- "Find those ratings for which the average age of sailors in the minimum overall ratings"
- "Find the sailor ids with top 5 rating ranks."

3. PROGRAMS ON PL/SQL

- Write a PL/SQL program to swap two numbers.
- Write a PL/SQL program to find the largest of three numbers.
- Write a PL/SQL program to find the total and average of 6 subjects and display the grade.
- Write a PL/SQL program to find the sum of digits in a given umber.
- Write a PL/SQL program to display the number in reverse order.
- Write a PL/SQL program to check whether the given number is prime or not.
- Write a PL/SQL program to find the factorial of a given number.
- Write a PL/SQL code block to calculate the area of a circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in an empty table named areas, consisting of two columns radius and area.
- Write a PL/SQL program to accept a string and remove the vowels from the string. (When 'Hello' passed to the program it should display 'Hll' removing e and o from the word Hello).
- Write a PL/SQL program to accept a number and a divisor. Make sure the divisor is less than or equal to Else display an error message. Otherwise Display the remainder in words.

4. **PROCEDURES AND FUNCTIONS**

- Write a function to accept employee number as parameter and return Basic +HRA together as single column.
- Accept year as parameter and write a Function to return the total net salary spent for a given year.
- Create a function to find the factorial of a given number and hence find NCR.
- Write a PL/SQL block o pint prime Fibonacci series using local functions.
- Create a procedure to find the lucky number of a given birth date.
- Create function to the reverse of given number

5. TRIGGERS

- Insert row in employee table using Triggers. Every trigger is created with name any trigger have same name must be replaced by new name. These triggers can be raised before insert, update or delete rows on data base. The main difference between a trigger and a stored procedure is that the former is attached to a table and is only fired when an INSERT, UPDATE or DELETE occurs.
- Convert employee name into uppercase whenever an employee record is inserted or updated. Trigger to fire before the insert or update.
- Trigger before deleting a record from employee table. Trigger will insert the row to be deleted into table called delete_emp and also record user who has deleted the record and date and time of delete.

6. PROCEDURES

- Create the procedure for palindrome of given number.
- Create the procedure for GCD: Program should load two registers with two Numbers and then apply the logic for GCD of two numbers. GCD of two numbers is performed by dividing the greater number by the smaller number till the remainder is zero. If it is zero, the divisor is the GCD if not the remainder and the divisors of the previous division are the new set of two numbers. The process is repeated by dividing greater of the two numbers by the smaller number till the remainder is zero and GCD is found.
- Write the PL/SQL programs to create the procedure for factorial of given number.
- Write the PL/SQL programs to create the procedure to find sum of N natural number.
- Write the PL/SQL programs to create the procedure to find Fibonacci series.
- Write the PL/SQL programs to create the procedure to check the given number is perfect or not

7. CURSORS

- Write a PL/SQL block that will display the name, dept no, salary of fist highest paid employees.
- Update the balance stock in the item master table each time a transaction takes place in the item transaction table. The change in item master table depends on the item id is already present in the item master then update operation is performed to decrease the balance stock by the quantity specified in the item transaction in case the item id is not present in the item master table then the record is inserted in the item master table.
- Write a PL/SQL block that will display the employee details along with salary using cursors.
- To write a Cursor to display the list of employees who are working as a Managers or Analyst.
- To write a Cursor to find employee with given job and dept no.
- Write a PL/SQL block using implicit cursor that will display message, the salaries of all the employees in the 'employee' table are updated. If none of the employee's salary is updated we get a message 'None of the salaries were updated'. Else we get a message like for example, 'Salaries for 1000 employees are updated' if there are 1000 rows in 'employee' table

Reference Books:

1. Ramez Elmasri, Shamkant, B. Navathe, "Database Systems", Pearson Education, 6th Edition, 2013.

2. Peter Rob, Carles Coronel, “Database System Concepts”, Cengage Learning, 7th Edition, 2008.

Course Outcomes:

- Design databases
- Retrieve information from data bases
- Use procedures to program the data access and manipulation
- Create user interfaces and generate reports

List of COs	**PO no. and keyword**	**Competency Indicator**	**Performance Indicator**
CO1	PO 3: Design/Development of Solutions	3.3	3.3.1
CO2	PO2: Problem analysis	2.3	2.3.1
CO3	PO 3: Design/Development of Solutions	3.1	3.1.3
CO4	PO 5: Modern tool usage	5.1	5.1.1