REAL ANALYSIS

1. Course Description

Programme: B.Sc | **Max. Hours : 60**

Course Code: U26/MAT/DSC/201 | **Hours per week : 04**

Course Type: DSC- II | **Max. Marks : 100**

No. of credits: 4

2. Course Objectives

1. To offer a thorough introduction to the fundamental ideas of Real Analysis and explain their relevance to current Mathematical progress.
2. To demonstrate the applicability of Real Analysis in analyzing and solving domain-specific challenges within Computer Science, Engineering, Physics, Economics, and various other disciplines.

3. Course Outcomes

After the successful completion of the course, the student will be able to:

CO 1: Recall and explain the concepts of open sets, closed sets, and the convergence and divergence of sequences. (L I)

CO 2: Explain the concepts of convergence of series using various tests, including the limits and continuity of functions. (L II)

CO 3: Analyze the differentiability of real functions using Rolle's Theorem and the Mean Value Theorem. (L IV)

CO 4: Explain the conditions and algebra of integrability for real functions using the Fundamental Theorem of Calculus. (L II)

10/3/26

Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/3/26

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

4. **Course Content**

Module – I **15 Hours**

Real Numbers:
Field Structure and Order Structure, Bounded and Unbounded Sets, Completeness in the Set of Real Numbers, Absolute value of a Real Number

Sections: 2, 3, 4, 5 of Chapter 1, Pg. No: 9 to 26

Open Sets, Closed Sets and Countable Sets:
Limit Points of a Set, Closed Sets- Countable and Uncountable Sets.

Sections: 2, 3, 4 of Chapter 2, Pg. No: 31 to 43.

Real Sequences:
Sequences, Limit Points of a Sequence, Convergent Sequences, Non-Convergent Sequences (Definitions), Cauchy 's General Principle of Convergence, Algebra of Sequences, Some Important Theorems, Monotonic Sequences.

Sections: 1, 2, 4, 5, 6, 7, 8, 9 of Chapter 3, Pg. No: 44 to 50, 52 to 98.

Module -II

15 Hours

Infinite Series:
Positive Term Series, Comparison Tests for Positive Term Series, Cauchy's Root Test, D'Alembert's Ratio Test, Logarithmic Test, Integral Test, Alternating Series (Leibnitz Test). **Sections: 2, 3, 4, 5, 7, 8, 10.1, 10.2 of Chapter 4, Pg. No:103 to 116, 119 to 124, 130 to 136.**

Functions of a Single Variable (I):
Limits, Continuous Functions, Functions Continuous on Closed Intervals.

Sec 1, 2, 3 of Chapter 5, Pg. No: 145 to 171

Module-III **15 Hours**

Functions of a Single Variable (II):
The Derivative, Increasing and Decreasing Functions, Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem, Higher order derivatives.

Sections: 1, 3, 5, 6, 7, 8 of Chapter 6, Pg No: 177 to 180, 184 to 186, 188 to 208.

Module-IV **15 Hours**

Riemann Integral:
Definition and Existence of the Integral, Refinement of Partitions, Darboux's Theorem, Conditions of Integrability, Integrability of the Sum and Difference of Integrable Functions, The Integral as a Limit of Sums, Some Integrable Functions, Integration and Differentiation, The Fundamental Theorem of Calculus.

Sections: 1, 2, 3, 4, 5, 6, 7, 8, 9 of Chapter 9, Pg. No: 263 to 287, 291-300.

Rekha R.J 10/3/26

Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

K Phaneendra 10/3/26

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

5. Reference Books:

1. S.C Malik and Savita Arora, Mathematical Analysis, Seventh Edition, New Age International Publishers.
2. Kenneth A Ross - Elementary Analysis: The theory of Calculus, Springer, Second Edition, 2013.
3. William F. Trench- Introduction to Real Analysis, Prentice Hall/ Pearson Education, First Edition, 2003.
4. Lee Larson - Introduction to Real Analysis I, University of Louisville (course notes), 2014.
5. Shanti Narayan & P. K Mittal – A course of Mathematical Analysis, S Chand & Company Ltd., Revised (29th Edition), 2005.
6. Brian S. Thomson, Judith B. Brucker & Andrew M. Bruckner – Elementary Real Analysis, Prentice Hall, First Edition 2001; Second Edition 2008.

6. Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local/Regional/National /Global Development Needs	Relevance
National	Understanding the integrability of real functions and the Fundamental Theorem of Calculus equips students with essential mathematical skills used in scientific research, engineering analysis, and data modelling, which are important for technological and scientific development.
Global	Real analysis is a versatile and fundamental branch of mathematics with applications spanning a wide range of disciplines. Its rigorous methods and concepts provide a solid framework for understanding and solving real-world problems in various scientific, engineering, and economic fields.

Reetha R-J
10/3/26
Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/3/26
Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

a) **Components on Skill Development/Entrepreneurship Development/Employability.**

SD/ED/EMP	Syllabus Content	Description of Activity
Skill Development	Module I, II, III & IV	Fundamentals of Real Analysis using Mathematical Software
Employability	Module I, II, III & IV	Real analysis helps in understanding optimization, modelling, and stability of economic systems used in financial analysis and forecasting.

7. **Pedagogy**

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Participative Learning	Presentations, Interactive Classroom games/Quiz
2.	Experiential Learning	Field Trips
3.	Problem Solving	Assignments, Research Projects

Rekha R.J
10/3/26

Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/3/26

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

b) CO	Continuous Internal Assessments CIA - 40%	End Semester Examination- 60%
CO1	CIA-1 - Written Exam	Written Exam
CO2	CIA-I(Written Exam)	
CO3	CIA-II (Skill Tests)	
CO4	CIA-II (Assignments)	

10/3/26

Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/3/26

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

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c) Model Question Paper- End Semester Exam Theory

MODEL QUESTION PAPER
THEORY

Course Code: U26/MAT/DSC/201 **Max. Marks: 60**
No. Of Credits: 4 **Max. Time: 2 Hrs**

Note: This question paper consists of Section A and B. The answer to Section A & B must be written in the answer book given.

SECTION – A (Long Essay Type)

I. Answer ALL questions: **Marks: 4 x 10 =40M**

1. (a) Prove that every bounded sequence with a unique limit point is convergent.

   (b)Show that $\lim_{n \to \infty} \frac{3 + 2\sqrt{n}}{\sqrt{n}} = 2$.

OR

2. State and Prove Cauchy 's General Principle of Convergence.

3. (a) State and prove D' Alembert's Ratio Test.

   (b) Test for the convergence of the series (a)$\sum_{n=0}^{\infty} \frac{1}{2n^2 + 1}$.

OR

4. (a) State and prove Cauchy's Root Test.

   (b) If a function f is continuous on a closed interval [a, b] then f attains its bounds at least once in [a, b].

5. (a) State and prove Rolle's Theorem,

   (b) Expand $f(x) = e^x$ using Maclaurin's theorem.

OR

6. (a) Prove Taylor's Theorem with Lagrange's form of remainder.

   (b) Show that using Cauchy's Mean Value theorem $\frac{\sin\alpha - \sin\beta}{\cos\beta - \cos\alpha} = \cot\theta$,where $0 < \alpha < \theta < \beta < \pi/2$.

7. (a) Prove that a necessary and sufficient condition for the integrability of a bounded function f is that for every $\in > 0$ there corresponds $\delta > 0$ such that for every partition P of [a, b] with norm P $< \delta$ is $U(P, f) - L(P, f) < \in$.

Rekha R-J
10/3/26
Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/3/26
Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

(b) Show that a constant function is integrable and $\int_a^b k\,dx = k\,(b-a)$.

OR

8. (a) State and prove the Fundamental Theorem of Calculus.

(b)Show that $\int_1^2 (3x + 1)\,dx = \frac{11}{2}$.

SECTION –B (Short Essay Type)

II. Answer any FOUR of the following questions: **Marks: 4 x 5=20M**

9. Show that the sequence $S_n = \frac{1}{n+1} + \frac{1}{n+2} + \frac{1}{n+3} + \ldots\ldots\ldots + \frac{1}{n+n}$ is convergent.

10. Show that the series $1 + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \ldots\ldots\ldots$ is convergent.

11. Discuss the kind of discontinuity for the function f defined as

$$f(x) = \begin{cases} \frac{x-|x|}{x} & when\ x \neq 0 \\ 2 & when\ x = 0 \end{cases}.$$

12. Determine whether the function f defined on R by $f(x) = \begin{cases} x & if\ 0 \leq x \leq 1 \\ 1 & if\ x \geq 1 \end{cases}$

is differentiable.

13. Examine the validity of the hypothesis and conclusion of Lagrange's Mean Value Theorem for $f(x) = |x|$ on $[-1, 1]$.

14. Prove that every continuous function is integrable.

Rekha R-J
10/2/26
Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/2/26
Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

Question Paper format – Bloom's Taxonomy Level

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Question Paper format – Bloom's Taxonomy Level

SECTION A - INTERNAL CHOICE				4Q X 10 M = 40 M
Question Number	**Module Covered**	**Question**	**CO**	**BTL (Bloom's Taxonomy Level)**
1	Module I	(a) Prove that every bounded sequence with a unique limit point is convergent (b) Show that $\lim_{n\to\infty} \frac{3+2\sqrt{n}}{\sqrt{n}} = 2$	CO 1	Level I
2	Module I	State and Prove Cauchy 's General Principle of Convergence.	CO 1	Level I
3	Module II	(a) State and prove D' Alembert's Ratio Test. (b) Test for the convergence of the series (a)$\sum_{n=0}^{\infty} \frac{1}{2n^2+1}$	CO 2	Level II
4	Module II	(a) State and prove Cauchy's Root Test. (b) If a function f is continuous on a closed interval [a, b]. then f attains its bounds at least once in [a, b].	CO 2	Level II
5	Module III	(a) State and prove Rolle's Theorem. (b) Expand $f(x) = e^x$ using Maclaurin's theorem	CO 3	Level IV
6	Module III	(a) Prove Taylor's Theorem with Lagrange's form of remainder. (b) Show that using Cauchy's Mean Value theorem $\frac{sin\alpha - sin\beta}{cos\beta - cos\alpha} = cot\theta$, where $0 < \alpha < \theta < \beta < \pi/2$.	CO 3	Level IV
7	Module IV	(a) Prove that a necessary and sufficient condition for the integrability of a bounded function f is that for every $\epsilon > 0$ there corresponds $\delta > 0$ such that for very parttion P of [a, b] with norm $P < \delta$ is $U(P,f) - L(P,f) < \epsilon$. (b) Show that a constant function is integrable and $\int_a^b k\,dx = k\,(b-a)$.	CO 4	Level II
8	Module IV	(a) State and prove Fundamental theorem of Calculus. (b) Show that $\int_1^2 (3x+1)\,dx = \frac{11}{2}$.	CO 4	Level II

Rekha A-J 10/2/26

Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

10/2/26

SECTION B - ANSWER ANY 4 OUT OF 6 **(To compulsorily have ONE question from each module)**				**4Q X 5 M = 20 M**
9	Module I	Show that the sequence $S_n = \frac{1}{n+1} + \frac{1}{n+2} + \frac{1}{n+3} + \ldots\ldots\ldots + \frac{1}{n+n}$ is convergent	CO 1	Level I
10	Module I	Show that the series $1 + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \ldots\ldots\ldots$ is convergent.	CO 1	Level I
11	Module II	Discuss the kind of discontinuity for the function f defined as $f(x) = \begin{cases} \frac{x - \lvert x \rvert}{x} & when\ x \neq 0 \\ 2 & when\ x = 0 \end{cases}$	CO 2	Level II
12	Module II	Determine whether the function f defined on R by $f(x) = \begin{cases} x & if\ 0 \leq x \leq 1 \\ 1 & if\ x \geq 1 \end{cases}$ is differentiable	CO 2	Level II
13	Module III	Examine the validity of the hypothesis and conclusion of Lagrange's Mean value theorem for $f(x) = \lvert x \rvert$ on $[-1, 1]$	CO 3	Level IV
14	Module IV	Prove that every continuous function is integrable.	CO 4	Level II

c. Question Paper Blueprint

Modules	**Hours Allotted in the Syllabus**	**CO Addressed**	**Section A (No. of Questions)**	**Total Marks**	**Section B (No. of Questions)**	**Total Marks**
1	15	CO-1	2	4x10=40	6 (By taking at least one question from each Module)	4x5=20
2	15	CO-2	2			
3	15	CO-3	2			
4	15	CO-4	2			

Rekha K-J
10/3/26
Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

K Phaneendra
10/3/26
Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

9. CO-PO Mapping

CO	PO	Cognitive Level	Classroom sessions (hrs.)
1	1, 2	Remember	15
2	2, 7	Understand	15
3	1, 2	Analyze	15
4	1, 2	Discuss	15

Rekha R.J
10/2/26

Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/2/26

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

REAL ANALYSIS

Practical Syllabus

1. Course Description

Programme: B.SC.
Course Code: U26/MAT/DSC/201/P
Course Type: DSC 2
No. of credits: 1

Max. Hours: 30
Hours per week: 02
Max. Marks : 50

2. Course Objectives:

1. Test the convergence or divergence of a given sequence/series.
2. Analyze the behaviour of functions with regard to continuity, differentiability and integrability.

3. Course Outcomes

After the successful completion of the course, the student will be able to:

CO1: Test the convergence or divergence of a given sequence.
CO2: Understand the convergence or divergence of a given series.
CO3: Analyze the behaviour of functions with regard to derivability.
CO4: Discuss the Riemann integrability of real functions.

Kphaneendra 10/3/26

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

Rekha R-J 10/3/26

Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

PRACTICAL SESSIONS

1. Limit of Sequences
2. Cauchy Sequences and Monotone Sequences
3. Infinite Series
4. Integral Tests and Alternating Series
5. Continuous functions
6. Derivatives
7. The Mean Value Theorems
8. Higher Order Derivatives.
9. Riemann Integrals-I
10. Riemann Integrals-II

Rekha N J
10/3/26

Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

10/3/26

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

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6.Model Question Paper – End Semester Exam Practical

REAL ANALYSIS

Programme : B.Sc.
Course Code :U26/MAT/DSC/201/P
Type of Course: DSC-II **Max. Marks: 50**
No. of credits : 1

I. Answer any SIX of the Following **6x5=30M**

1. Using the definition of limit show that $\lim_{n\to\infty} \frac{2n-3}{n+1} = 2$.

OR

2. Show that the sequence $\{S_n\}$, where $S_{n=1+}\frac{1}{2}+\frac{1}{3}+\ldots..+\frac{1}{n}$ cannot converge.
3. Test for convergence of the series $\frac{1.2}{3^2.4^2} + \frac{3.4}{5^2.6^2} + \frac{5.6}{7^2.8^2} + \cdots$.

OR

4. Show that the following series is convergent:
$1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}\ldots..$
5. Investigate the continuity at the indicated point $f(x) = \begin{cases} \frac{x^3-8}{x^2-4} & when\ x \neq 2 \\ 3 & when\ x = 2 \end{cases}$ at x=2.

OR

6. Discuss the derivability of the function $f(x) = \begin{cases} 1 & when\ 0 \leq x \leq 1 \\ x & when\ x > 1 \end{cases}$ at x=1.
7. Examine the validity of the hypothesis and the conclusion of Rolle's theorem for $f(x) = (x-a)^m(x-b)^n$ where m and n are positive integers on [a, b].

OR

8. Use Taylor's theorem to show that $\cos x \geq 1-\frac{x^2}{2}$, for all real x.
9. Show that a constant function k is integrable and $\int_a^b k\,dx = k\,(b-a)$.

OR

10. Compute $\int_{-1}^{1}|x|\,dx$.

Prepared by	Checked &verified by	Approved by
K-Lavanya.	Rekha R J	
Dr. K Lavanya	Dr.Rekha R Jaichander	Prof. Uma Joseph

Rekha RJ
10/3/26
Head
Dept. of Mathematics
St. Francis College for Women
Begumpet, Hyderabad-16.

Dr. K. PHANEENDRA
Professor
Department of Mathematics
Osmania University
Hyderabad-500 007.

10/3/26.

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SEMESTER – II

DATA STRUCTURES

1. Course Description

Programme: B.Sc.
Course Code: U26/CSC/DSC/201
Course Type: DSC
No. of credits: 4

Max. Hours:60
Hours per week:4
Max. Marks: 100

2. Course Objectives

1. To provide the knowledge of basic data structures and their implementations.
2. To develop skills to apply appropriate data structures in problem solving.

3. Course Outcomes:

After the successful completion of the course, the student will be able to:

CO1: To ***demonstrate*** an ***understanding*** of basic data structures and solve problems of Sorting, searching. (LII & L III)

CO2: ***Illustrate*** linear data structure such as stacks, queues and their applications. (L III)

CO3: ***Analyze***operations on linked lists and compare different linked list types(L IV)

CO4: To ***describe*** basic operations on trees and graphs and various graph traversal techniques. (L II)

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

4. Course Content

MODULE I: **15 Hours**

INTRODUCTION TO DATA STRUCTURES

Introduction to data structures, Types of data structures, Data structure Operations. Array: Array Traversal, Linear Search, Binary Search; Sorting using Non-Recursive Methods-Bubble Sort, Selection Sort and Insertion Sort; Sorting using Recursive methods- Merge Sort and Quick Sort.

MODULE II: **15 Hours**

STACKS AND QUEUES

Stacks-Introduction, Stacks, stack operations, applications of stack,stack Implementation.Queues- Introduction, Queues-Basic Concept, Queue Operations,applications of Queue, Queue Implementation. Circular Queues.

MODULE III: **15 Hours**

LINKED LIST

Introduction to Linked Lists- Basic Concept,Types of Linked Lists,Single Linked List Implementation, Linked List implementation of Stack, Linked List implementation of Queue, Doubly Linked List.

MODULE IV: **15 Hours**

TREES AND GRAPHS

Trees- Introduction, Binary Tree, Binary Tree Representation, Binary Tree, Traversal, Binary Search Tree, Applications of Trees- Heap Sort. Introduction to Graphs- Types of Graphs,Graph Implementation- ArrayGraph Traversal-Depth First Search, Breadth First Search. Spanning Tree, Prim's Algorithm, Kruskal's Algorithm.

5. References:

1. Data Structures Using C ,byE.Bala Guruswamy, McGraw Hill Education,FirstEdition,2017
2. Data Structures, by G.S.Baluja, Dhanpat Rai & Co. (P) Limited, First Edition
3. The Ultimate C with Data Structures,Wiley India, by R. NAGESWARA RAO
4. Data Structures With C By Seymour Lipschutz ,Schaum's outline series.

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

6.Syllabus Focus

a) Relevance to Local, Regional, National and Global Development Needs

Local /Regional/National /Global Development Needs	Relevance
Global	This course helps students learn different Algorithms in data Structures

b) Components on Skill Development/Entrepreneurship Development/Employability

SD/ED/EMP	Syllabus Content	Description of Activity
SD	Module I, II	Understanding and applying various searching, sorting techniques. Implementing stacks and queues.
SD	Module III, IV	Practical implementation of linked lists, trees and graphs.

7.Pedagogy

S. No	Student Centric Methods Adopted	Type / Description of Activity
1.	Group Discussion	Participative Learning Group Discussion
2.	Interactive Classroom games	Experiential Learning
3.	Problem solving	Case studies

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

8. Course Assessment Plan

a) Weightage of Marks in Continuous Internal Assessments and End Semester Examination

CO	Continuous Internal Assessments CIA - 40%	End Semester Examination- 60%
CO1	CIA-1 Quiz test or subjective	Written Exam
CO2	CIA-1 Written exam	
CO3	CIA-2 Written Assignment	
CO4	CIA-2 Presentation	

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

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b) Model Question Paper- End Semester Exam

DATA STRUCTURES

Course Code: U26/CSC/DSC/201 **Max.Marks:60**

Credits:4 **Time: 2 hrs**

SECTION - A (Long Essay Type)

I. Answer ALL questions **Marks: 4 x 10 =40**

1. a) Write a program to implement selection sort.
   b) Trace the following list using selection sort 23 12 35 19 41 38

OR

2. Write a program to implement merge sort.

3. Explain applications of stacks.

OR

4. Explain the concept of Stack. Write a program to implement a stack using arrays.

5. Explain single linked lists.Write a program to insert at the beginning and end and display the elements of a single linked list

OR

6. Write a program to perform the linked queue operations.

7. Explain binary trees. List and explain the various tree traversals with an example.

OR

8. Explain Spanning Tree. Explain with example any one minimum Spanning Tree Algorithm.

SECTION - B (Short Essay Type)

II. Answer any Four **4x 5=20 M**

9. Write a program to sort the elements using bubble sort.
10. Explain doubly linked list.
11. Explain Binary Search with example.
12. Write the node structure for a single linked list.
13. Explain Circular Queue.
14. Explain Breadth First Search with examples.

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

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Question Paper format – Blooms Taxonomy Level

SECTION A - INTERNAL CHOICE			**4Q X 10 M = 40 M**	
Question No	**Module Covered**	**Question**	**CO**	**BTL (Blooms Taxonomy Level)**
1	Module 1	a)Write a program to implement selection sort. b)Trace the following list using selection sort 23 12 35 19 41 38	CO 1	Level II &III
2	Module 1	Write a program to implement merge sort.	CO 1	Level II & III
3	Module 2	Explain applications of stacks.	CO 2	Level III
4	Module 2	Explain the concept of Stack. Write a program to implement a stack using arrays.	CO 2	Level III
5	Module 3	Explain single linked lists.Write a program to insert at the beginning and end and display the elements of a single linked list	CO 3	Level IV
6	Module 3	Explain Queue. Write a program to perform the linked queue operations.	CO 3	Level IV
7	Module 4	Explain binary trees. List and explain the various tree traversals with an example.	CO 4	Level II
8	Module 4	Explain Spanning Tree. Explain with example any one minimum Spanning Tree Algorithm.	CO 4	Level II
SECTION B - ANSWER ANY 4 OUT OF 6 (To compulsorily have ONE question from each module)			**4Q X 5 M = 20 M**	
9	Module 1	Write a program to sort the elements using bubble sort.	CO 1	Level II & III
10	Module 3	Explain doubly linked list.	CO 3	Level IV
11	Module 1	Explain Binary Search with example.	CO 1	Level II & III
12	Module 3	Write the node structure for a single linked list.	CO 3	Level IV
13	Module 2	Explain Circular Queue	CO 2	Level III
14	Module 4	Explain Breadth First Search with examples.	CO 4	Level II

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

c) Question Paper Blueprint

Modules	Hours Allotted in the Syllabus	COs Addressed	Section A (No. of Questions)	Total Marks	Section B (No. of Questions)	Total Marks
1	15 hrs	CO-1	2	4x10=40	6 (By taking at least one question from each Module)	4x5=20
2	15 hrs	CO-2	2			
3	15 hrs	CO-3	2			
4	15 hrs	CO-4	2			

9. CO-PO Mapping

CO	PO	Cognitive Level	Class room sessions(hrs.)
1	1	Analyze	15
2	2	Understand	15
3	1	Remember	15
4	2	Understand	15

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

CBCS 2026

DATA STRUCTURES
Practical Syllabus

1. Course Description

Programme: B.Sc.
Course Code: U26/CSC/DSC/201/P
Course Type: DSC
No. of credits: 1

Max. Hours: 30
Hours per week: 2
Max. Marks: 50

2. Course Objective:

To introduce the fundamental concepts of data structures through C language

3. Course Outcomes:

CO1: To understand searching and sorting techniques using coding exercise
CO2: Apply the principles of stacks, queues and linked lists

4. Course Content:

1. Program to implement linear search.
2. Program to implement Binary search.
3. Program to implement Bubble sort.
4. Program to implement Selection sort.
5. Program to implement Insertion sort.
6. Program to implement Merge sort.
7. Program to implement Quick sort.
8. Program to implement Stack using arrays.
9. Program to implement Queue using arrays.
10. Program to implement Single Linked List.
11. Program to implement Stack using Linked List.
12. Program to implement Queue using Linked List.
13. Program to implement Double Linked List.
14. Program to implement Recursive Binary tree traversals

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
Begumpet, Hyderabad-500 016.

CBCS 2026

PRACTICAL MODEL PAPER

Programme: B.Sc.
Course Code: U26/CSC/DSC/201/P
Type of Course: DSC
No. of credits: 1

Max. Marks: 50
Time :2 hours

I. Answer the following questions

1. Write a C Program to implement Selection Sort.
2. Write a program to implement operation of Queue
3. Write a C Program to implement Stack using linked lists.

OR

4. Write a C Program to implement Binary tree traversals.

Prepared by	Checked &verified by	Approved by
Ms. Jenifer Teaching faculty	Dr. Sr. Sujatha Yeruva HoD	Prof. Uma Joseph Principal

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
Osmania University,
Hyderabad-500 007.

HOD Computer Science
ST FRANCIS COLLEGE FOR WOMEN,
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Panel of Examiners

S.No.	B.Sc-Course Title	Examiner	Designation Place of Work	Contact No.
1.	**Semester I**	Dr. Teresa	Loyola Academy Secunderabad	9949099350
		Dr. Sunitha	Kasturba Gandhi Degree and PG College for Women	9676056078
		Ms T. Vamshi Mohana	RBVRR College, Narayanguda, Hyderabad	9849338286
		Mr. Subash Chander	Nizams College, Hyderabad	9505656130
2.	**Semester II**	Mr Mahesh	Jagruti College	8008677784
		Mr. Ramana	Bhavan's College, Sainikpuri	9949693094
		Ms. Jacintha	Loyola Academy	9908082486
		Mr. Abhishek	Nizam's College	7286834895

PROFESSOR
Department of Computer Science & Engineering
University College of Engineering (A)
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HOD Computer Science
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SEMESTER II

PROBABILITY DISTRIBUTIONS PRACTICAL (CONVENTIONAL)

1.Course Description

Programme : B.Sc
Course Code :U26/STA/DSC/201/P
Course Type : DSC 2A
No of Credits : 1

No of Hrs allotted: 2Hrs./Week
Max . Marks: 50

2.Course Objectives :

- To develop computational skills in fitting discrete and continuous probability distributions to observed frequency data using appropriate statistical methods.
- To enable students to interpret fitted distributions by comparing observed and expected frequencies and assessing the suitability of theoretical models for real datasets.

3.Course Outcomes:

CO 1 : **Apply** appropriate methods to fit Binomial, Poisson, Negative Binomial, Geometric, Normal, Exponential, and Cauchy distributions to given data.

CO 2 : **Analyze** and **interpret** observed and expected frequencies using direct, recurrence relation, area, and ordinate methods to assess the suitability of fitted distributions.

4.Course Content :

1. Fitting of Binomial distribution for n and p=q=1/2
2. Fitting of Binomial distribution –Recurrence Relation Method
3. Fitting of Poisson distribution –Direct Method
4. Fitting of Poisson distribution – Recurrence relation Method.
5. Fitting of Negative Binomial Distribution.
6. Fitting of Geometric distribution.
7. Fitting of Normal Distribution – Area Method.
8. Fitting of Normal Distribution – Ordinates Method.
9. Fitting of Exponential distribution.
10. Fitting of Cauchy distribution.

Head
Dept. Of Statistics
St. Francis College for Women
Begumpet, Hyderabad-16.

CHAIRPERSON
Board of Studies in Statistics
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Osmania University, Hyderabad-7.

Practicals Using MS-EXCEL AND SPSS

1. Fitting of Binomial distribution
2. Fitting of Poisson Distribution
3. Fitting of Normal Distribution
4. Fitting of Exponential distribution
5. Fitting of Cauchy Distribution

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Model Question Paper – End Semester Exam Practical

Course Code: U26/STA/DSC/201/P **Max. Marks: 50**
Credits : 1 **Time: 2 Hrs.**

Answer any THREE questions. **3 x 10= 30**

1. The screws produced by a certain machine were checked by examining samples of 12.The following table shows the distribution of 128 samples according to the number of defective pieces recorded. Fit a Binomial distribution using recurrence relation.

No.of defective pieces	0	1	2	3	4	5	6	7	8	9	10	11	12
No.of samples	2	5	6	8	10	15	20	25	14	10	7	5	1

2. The number of ISD calls made from a telephone booth was tabulated on a day-wise basis as follows .Use the direct formula to fit a Poisson distribution .

No.of ISD calls	0	1	2	3	4	5	6	7
No.of samples	11	25	56	40	22	13	5	0

3. The waiting time X(in minutes) of a railway booking counter is exponentially distributed. The following data is obtained for 200 passengers.

Waiting time	0-5	5-10	10-15	15-20	20-25	25-30	30-35
No.of samples	2	5	6	8	10	15	20

4. Fit a normal distribution by AREAS method to the following data and find the expected frequencies.

C . I	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24-27	27-30
f	4	9	23	43	57	53	36	18	7

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PRACTICAL EVALUATION

S. No	Evaluation	Marks
1	Written Exam	30M
2	Lab	10M
3	Viva	5M
4	Record	5M
	Total	50M

Prepared by	Checked &Verified by	Approved by
Name and Signature of the teaching faculty (G.Priyanka)	Name and Signature of HoD (Dr. Ch.Yugandhar)	Name and Signature of Principal (Prof. T. Uma Joseph)

Head
Dept. Of Statistics
St.Francis College for Women
Begumpet,Hyderabad-16.

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Board of Studies in Statistics
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