P. B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE: VIJAYAWADA-10.
(An Autonomous college in the jurisdiction of Krishna University, Machilipatnam)

Semester I	Course Code	Course Title	Credits	Hours
B.Sc. (CAMS / CAME / MSCS / CSCS / MPCS / MECS)	**CSCP11B/ CGSP11(CSCS)**	**Problem Solving in C Lab**	**1**	**30**

Course Outcome No	Upon successful completion of this course, students should have the knowledge and skills to:	Program Outcome No
CO1	Apply logical skills to analyze a given problem	PO1, PO7, PSO1, PSO4, PSO2
CO2	Design an algorithmic solution for a given problem	PO1, PO7, PSO1, PSO4, PSO2
CO3	Write a maintainable C program according to coding standards for a given algorithm	PO1, PO7, PSO1, PSO4, PSO2
CO4	Debug a given program	PO1, PO7, PSO1, PSO4, PSO2
CO5	Execute the C program	PO1, PO7, PSO1, PSO4, PSO2

		CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Course Code: CSCP11A	Title of the Course: Programming using C Lab	CO1					L	M	L
		CO2					M	L	M
		CO3					L	M	L
		CO4					M	L	H
		CO5					L	M	L

Experiments List

Cycle-I

Week 1:

Write a C program to check whether the given two numbers are equal, bigger or smaller?

Week 2:

Write a C program to perform arithmetic operations using Switch...case?

Week 3:

- Write a program to find the sum of individual digits of a positive integer.
- Write a program to check whether the given number is Armstrong or not.

Week 4:

Write a program to generate the first N terms of the Fibonacci sequence.

Week 5:

Write a program to find both the largest and smallest number in a list of integer values

Week 6:

- Write a program that uses functions to add two matrices.
- Write a program for multiplication of two n X n matrices.

Week 7:

Write a program to demonstrate refection of parameters in swapping of two integer values using Call by Value& Call by Address.

Week 8:

Write a program to calculate factorial of given integer value using recursive functions.

Cycle-II

Week 9:

Write a program to search an element in a given list of values.

Week 10:

Write a program to illustrate pointer arithmetic.

Week 11:

Write a program to sort a given list of integers in ascending order.

Week 12:

Write a program to calculate the salaries of all employees using Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary) structure.

a. DA is 30 % of Basic Pay

b. HRA is 15% of Basic Pay

c. Deduction is 10% of (Basic Pay + DA)

d. Gross Salary = Basic Pay + DA+ HRA

e. Net Salary = Gross Salary - Deduction

Week 13:

Write a program to perform various string operations.

Week 14:

Write a program to read the data character by character from a file.

Week 15:

Write a program to create Book (ISBN, Title, Author, Price, Pages, Publisher) structure and store book details in a file and perform the following operations

a. Add book details

b. Search a book details for a given ISBN and display book details, if available

c. Update a book details using ISBN

d. Delete book details for a given ISBN and display list of remaining Books.

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Semester I	Course Code	Course Title	Credits	Hours
B.Sc. (CAMS / CAME / MSCS / CSCS / MPCS / MECS)	**CSCT11B/ CGST11(CSCS)**	**Problem Solving In C**	**4**	**60**

Course Objectives:

This course aims to provide exposure to problem-solving through programming and introduce the concepts of the C Programming language.

Course Learning Outcomes:

Course Outcome No	Upon successful completion of the course, a student will be able to:	Program Outcome No.
CO1	Understand the evolution & functionality of Digital Computers and develop an algorithm for solving a given problem.	PO1, PO7, PSO1, PSO4
CO2	Understand tokens and control structures in C.	PO1, PO7, PSO1, PSO4
CO3	Understand arrays and strings and implement them.	PO1, PO7, PSO1, PSO4
CO4	Understand the right way of using functions, pointers, structures and unions in C	PO1, PO7, PSO1, PSO4
CO5	Develop and test programs written in C files	PO1, PO7, PSO1, PSO4

		CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Course Code: CSCT11A	Title of the Course: Programming in C	CO1						L	M
		CO2						M	L
		CO3						M	L
		CO4						L	M
		CO5						M	L

UNIT I **12 periods**

General Fundamentals: Introduction to computers: Block diagram of a computer, characteristics and limitations of computers, applications of computers, types of computers, computer generations.

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages – Structured Programming Language- Design and Implementation of Correct, Efficient and Maintainable Programs.

UNIT II **12 periods**

Introduction to C: Introduction – Structure of C Program – Writing the first C Program –File used in C Program – Compiling and Executing C Programs – Using Comments –

Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C- Programming Examples.

Decision Control and Looping Statements: Introduction to Decision Control Statements– Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – goto Statement.

UNIT III **10 periods**

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array– Operations on Arrays – one dimensional, two dimensional and multi-dimensional arrays, character handling and strings.

UNIT IV **14 periods**

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

Structure, Union, and Enumerated Data Types: Introduction – Nested Structures – Arrays of Structures – Structures and Functions– Union – Arrays of Unions Variables – Unions inside Structures – Enumerated Data Types.

UNIT V **12 periods**

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Error Handling during File Operations – Accepting Command Line Arguments.

BOOKS

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.

2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language" - Pearson publications.

3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.

4. Yashavant Kanetkar - Let Us 'C' – BPB Publications.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))

4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion

2. Try to solve MCQ's available online.

3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),

2. Closed-book and open-book tests,

3. Problem-solving exercises,

4. Practical assignments and laboratory reports,

5. Observation of practical skills,

6. Individual and group project reports like "Creating Text Editor in C".

7. Efficient delivery using seminar presentations,

8. Viva voce interviews.

9. Computerized adaptive testing, literature surveys and evaluations,

10. Peers and self-assessment, outputs form individual and collaborative work

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MODEL Question Paper: 2020-2021

TITLE: Problem solving in C **COURSE CODE: CSCT11B/CGST11(CSCS)**
SECTIONS: B.Sc. (CAMS / CAME / MSCS / MPCS / MECS) & B. Sc (CSCS) **SEMESTER: I**
TIME: 3 Hrs. **MAX: 75M**

SECTION –A

ANSWER ANY FIVE QUESTIONS **5 X 5 =25 M.**

1. What is a flowchart? Utilize flowchart symbols and draw a flowchart to find biggest of two numbers. **(CO1, L3)**
2. Write a short note on block diagram of computers. **(CO1, L2)**
3. Explain do…while loop with an example program. **(CO2 , L2)**
4. Develop a C program to find largest number in a given integer list. **(CO3 ,L3)**
5. Classify data types in C. Write a short note on any two data types. **(CO2 , L2)**
6. How to declare and initialize 1D arrays. **(CO3, L1)**
7. Construct a student structure to accept student details and write a C program to calculate grade of a student. (**CO4 , L3)**
8. Illustrate command line arguments with an example program. **(CO5, L2)**

SECTION – B

ANSWER ALL THE QUESTIONS **5 X 10 =50 M.**

9 A) Define Algorithm. Demonstrate Key features of algorithm with examples. **(CO1, L2)**

(or)

B) List out the characteristics and limitations of computers. **(CO1, L1)**

10 A) Give Classification of Control statements in C. Explain multi-way decision making statements in C with examples. **(CO2, L2)**

(or)

B) Write a program to check whether the given number is Armstrong or not. **(CO2, L3)**

11 A) Develop a program in C for matrix multiplication. **(CO3, L3)**

(or)

B) Demonstrate various String handling functions in C with examples. **(CO3, L2)**

12 A) Compare and contrast structures with unions. **(CO4, L4)**

(or)

B) Explain the types of functions in C. **(CO4, L2)**

13 A) List different file handling functions in C. Explain with examples. **(CO5, L2)**

(or)

B) Explain call by value and call by reference with example. **(CO4, L2)**

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Parvathaneni Brahmayya Siddhartha College of Arts & Science, Vijayawada-10
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Reaccredited at the level 'A+' by the NAAC
College with Potential for Excellence
(Awarded by UGC)

GENERAL ENGLISH SYLLABUS FOR B.A/ B.COM/B.SC COURSES UNDER CBCS
SEMESTER-I

Course Code: ENGT11B **Time: 3 Hours**
Title: English Praxis– I **Max. Marks: 75**
Credits: 3 **Pass Marks: 30**

SYLLABUS
ENGLISH PRAXIS-I
A COURSE IN COMMUNICATION AND SOFT SKILLS

I. UNIT: Listening Skills 10 hours

1. Importance of Listening
2. Types of Listening
3. Barriers to Listening
4. Effective Listening

II. UNIT: Speaking Skills 10 hours

1. Sounds of English: Vowels and Consonants
2. Word Accent
3. Intonation

III. UNIT: Grammar 15 hours

1. Concord
2. Modals
3. Tenses (Present/Past/Future)
4. Articles
5. Prepositions
6. Question Tags
7. Sentence Transformation (Voice, Reported Speech & Degrees of Comparison)
8. Error Correction

IV. UNIT: Writing 10 hours

1. Punctuation
2. Spelling
3. Paragraph Writing

V. UNIT: Soft Skills 15 hours

1. SWOC
2. Attitude
3. Emotional Intelligence
4. Telephone Etiquette
5. Interpersonal Skills

REFERENCES:

1. A Course in Communication Skills and Soft Skills – I & II, Published by Orient Black Swan Private Limited, 2016.

2. A Course in Communication Skills and Soft Skills – III, Published by Orient Black Swan Private Limited, 2016.
3. "Communication Skills" by Leena Sen , published by Asoke K Ghosh, Prentice Hall of India Private Ltd – Delhi-110006.
4. "Effective English Communication for you" by Syamala, Emerald publishers New Edition-2007.
5. "A Practical Course in Spoken English" by J.K. Gangal, PHI Learning Private Ltd – 2010.
6. Murphy's English Grammar, Published by Cambridge University Press, 2004.
7. Communication Skills in English, Published by Oxford University Press, 1990.
8. Modern English by N. Krishnaswamy , Published by Macmillan India Limited, 1998.

GENERAL ENGLISH SYLLABUS FOR B.A/ B.COM/B.SC COURSES UNDER CBCS
SEMESTER-I

Course Structure and Syllabi under CBCS

Sl No.	Semester	Course Code	Name Of The Subject	Teaching Hours	Credits
1	**I Semester**	**ENGT11B**	**English Praxis-I**	4	3

OBJECTIVE: The main objective of this course is to equip the learners with listening, speaking, reading, writing skills and also build up their ability to use Soft Skills in their professional and daily life effectively.

COURSE OUTCOMES:

At the end of the course, the learners will be able to:

CO 1. Gain more confidence in learning various kinds of listening techniques as well as create more effective strategies to improve one's ability to listen and to understand people. **PO2**

CO 2. Improve their speaking ability in English both in terms of fluency and comprehensibility and practice in using English to perform preliminary communicative functions required for their everyday social and professional interactions with others. **PO2**

CO 3. Explore basic elements of grammar and test their abilities in concord, modals, tenses, articles, prepositions, question tags and transformation of sentences. **PO7**

CO 4. Develop their written expression of thought and discover opportunities to build connections within the areas of punctuations, spelling and paragraph writing. **PO2**

CO 5. Formulate problem solving skills, making appropriate and responsible decisions, improve their attitude, emotional intelligence, telephone etiquette and interpersonal skills. **PO6**

CO-PO MATRIX- ENG T11B							
CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	H						
CO2	H						
CO3							M
CO4		H					
CO5						H	

PARVATHANENI BRAHMAIAH SIDDHARTHA COLLEGE OF ARTS AND SCIENCE; VIJAYAWADA-10

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SEMESTER- I **PAPER - I**

TITLE OF THE PAPER: HINDI-I

NO OF HOURS: 60 **CREDITS: 03**

WEF: 2021-22

COURSE CODE: HINT11A

COURSE OUTCOMES:

1. मानव मूल्यों को पहचानकर छात्र समाज कल्याण हेतु अपने योगदान दे सकेंगे ।
2. आधुनिक युग की भावनाओं को पहचानकर सामाजिक समस्यओं के प्रति जागरुक हो सकेंगे।
3. हिन्दी और अंग्रेजी के माध्यम से विध्यार्थी अनुवाद कौशल विकसित कर सकेंगे।
4. छात्रों में व्याकरण के व्दारा भाषा में निपुणता बढ़ेगी।
5. छात्रों में पत्रलेखन व्दारा लेखन कौशल बढ़ेगा तथा संप्रेषण बढ़ेगा।

SYLLABUS

I.गद्य संदेश :

1.साहित्य की महत्ता

2.सच्ची वीरता

3.मित्रता

II.कथा – लोक :

1.मुक्तिधन

2.गूदड़ साई

3.उसने कहा था

III.व्याकरण : कार्यालयीन हिन्दी शब्दावली

(हिन्दी से अंग्रेजी में बदलना तथा अंग्रेजी से हिन्दी में बदलना)

IV. व्याकरण :

1.लिंग

2.वचन

3.विलोम शब्द

4.काल

5.वाच्य

6.वाक्य शुद्ध कीजिए

V.पत्र लेखन: पत्र लेखन (मित्र को पत्र, पिताजी को पत्र)

Recommended Books:

1.गद्य संदेश – Dr.V.L.Narasimham Siva Koti

2.कथा – लोक - Dr.Ghana Shyam

3.मिलिन्द प्रकाशन

Hyderabad-95.
Degree First Year Text Book,
Vikram Publishers Pvt. Ltd., Durga Agraharam, Vijayawada-2

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE :: VIJAYAWADA-520 010.
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I SEMESTER Model Question Paper

Course Code: HINT11A **Max. Marks: 70M**
Time: 3 Hrs. **Pass Min. : 30M**

SECTION-I

I निम्न लिखित प्रश्नों का उत्तर लिखिए। **4×5=20**

1.(a) जीवन में साहित्य की क्या आवश्यकता है? साहित्य व्दारा सभ्यता की परीक्षा किस प्रकार हो सकती है? L1

(अथवा)

(b) वीरता किसे कहते हैं? लेखक का 'सच्ची वीरता' से क्या अभिप्राय है? L1

2.(c) रहमान का चरित्र-चित्रण कीजिए। L2

(अथवा)

(d) गूदड़ साई का शीर्षक पर अपना उद्देश्य प्रकट कीजिए। L2

3.(e) काल किसे कहते हैं तथा उसके कितने प्रकार हैं? L3

(अथवा)

(f) वाच्य किसे कहते हैं तथा उसके कितने प्रकार हैं? L3

4.(g) **नीचे दिए गए शब्दों का लिंग बदलकर लिखिए। L1**

1.विद्वान 2.अध्यापक 3.मोर 4.ठाकुर 5.धोबी

(अथवा)

(h) **नीचे दिए गए शब्दों का वचन बदलकर लिखिए। L1**

1.लड़की 2.वीर 3.सेना 4. रुपया 5.कविता

SECTION-II **1×10=10**

5.(a) 'मित्रता' पाठ का सारांश लिखिए। L2

(अथवा)

(b) 'साहित्य की महत्ता' पाठ का सारांश लिखिए। L2

SECTION-III 1×10=10

6.(a) 'मुक्तिधन' कहानी का सारांश लिखिए। L2

(अथवा)

(b) 'उसने कहा था' कहानी का सारांश लिखिये। L2

SECTION-IV

7.(a) **किन्हीं पाँच शब्दों को अंग्रेजी से हिंदी में अनुवाद कीजिए। L2** **5×2=10**

1.Acceptance 2.Ballot Officer 3.Chairman 4.Duty 5.Supervisor
6.High Court 7.Fair copy 8.Eligibility 9. Passport 10.Accountant

(अथवा)

(b) **किन्हीं पाँच शब्दों को हिंदी से अंग्रेजी में अनुवाद कीजिए। L2**

1.प्रशासन 2.परिपत्र 3.गोपनीय 4.स्पष्टीकरण 5.राजदूत
6.निर्देशक 7.शिक्षा-अधिकारी 8.कुलपति 9.महा प्रबंधक 10.अनुवादक

8.(a) **किन्हीं पाँच शब्दों का विलोम शब्द लिखिए। L1** **5×2=10**

1.वीरता 2. अच्छा 3.नया 4.आना 5.भिन्न 6.सस्ता 7.मित्र 8. लेना

(अथवा)

(b) **वाक्य शुद्ध कीजिए। L1**

1.मोहन पुस्तक पढ़ा।

2.सीता ने चार आम खाया।

3.राम ने गया।

4.दशरथ की तीन रानियाँ थीं।

5.चोरी कौन किया?

SECTION-V 1×10=10

9.(a) पुस्तकें खरीदने के लिए पैसे माँगते हुए अपने पिताजी के नाम पर पत्र लिखिए। L3

(अथवा)

(b) हिंदी सीखने की आवश्यकता के बारे में बताते हुए अपने मित्र को पत्र लिखिए। L3

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PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE :: VIJAYAWADA-10.
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MATHEMATICS	MATT11A	2019-'20(BT)	B.Sc. & B.A. (EMS)

SEMESTER-I **PAPER-I** **No of Credits: 5**

DIFFERENTIAL EQUATIONS

Course Outcomes

S. No	C.O
	Upon successful completion of this course, students should have the knowledge and skills to:
1	Determine the solution of differential equations of the first order and of the first degree by Exact, Linear and Bernoulli's method.
2	Understand the basic concepts of first order differential equations to find Orthogonal trajectories.
3	Determine the solution of differential equations of the first order and of a degree higher than first by using methods of solvable for P, X, and Y.
4	Compute all solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable coefficients.
5	Calculate the solutions of higher order differential equations by Cauchy Euler and Variation of parameters.

CO-PO MATRIX

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1					H		
CO2					H		
CO3						M	
CO4							M
CO5							M

OBJECTIVES:

1. Understand all of the concepts relating to the order and linearity of ODEs, analytic and computational solution methods for ODEs, and the real-world applications of ODEs.
2. Apply your understanding of the concepts, formulas, and problem solving procedures to thoroughly investigate relevant physical models.

3. Explain the concepts of linear systems, ODE solution methods, and related ideas at a fundamental level, as well as how and why we use the solution techniques that we use.

UNIT-I: DIFFERENTIAL EQUATIONS OF FIRST ORDER& FIRST DEGREE (18Hrs)

1.1 Linear Differential Equations
1.2 Differential Equations Reducible to Linear Form, Bernoulli's differential equations.
1.3 Exact Differential Equations
1.4 Integrating Factors, 1/Mx+Ny, 1/Mx-Ny, $e^{\int f(x)dx}$, $e^{\int g(y)dy}$, *and Inspection method*
1.5 Change of Variables

UNIT-II: ORTHOGONAL TRAJECTORIES &DIFFERENTIAL EQUATIONS OF FIRST ORDER BUT NOT FIRST DEGREE (18Hrs)

2.1 Orthogonal Trajectories
2.2 Self Orthogonal Trajectories
2.3 Equations solvable for p
2.4 Equations solvable for y
2.5 Equations solvable for x
2.6 Equations Homogeneous in X & Y
2.7 Equations that do not contain x (or y)
2.8 Clairaut's Equation and Equations reducible to clairaut's form.

UNIT – III: Higher order linear differential equations-I (18Hrs)

3.1 Solution of homogeneous linear differential equations of order n with constant coefficients
3.2 Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators.
3.3 General Solution of f(D)y=0
3.4 General Solution of f(D)y=Q when Q is a function of x.
3.5 $\frac{1}{f(D)}$ is Expressed as partial fractions.
3.6 P.I. of f (D) y = Q when Q= be^{ax}
3.7 P.I. of f (D) y = Q when Q is b sinax or b cosax.

UNIT – IV: Higher order linear differential equations-II (18Hrs)

4.1 Solution of the non-homogeneous linear differential equations with constant coefficients.
4.2 P.I. of f (D) y = Q when Q= bx^k
4.3 P.I. of f (D) y = Q when Q= $e^{ax}V$
4.4 P.I. of f (D) y = Q when Q= xV
4.5 P.I. of f (D) y = Q when Q= x^mV where v = sin bx and cosbx

UNIT-V: Higher order Differential Equations –III (18Hrs)

5.1 The Cauchy-Euler Equation.
5.2 Linear differential Equations with non-constant coefficients
5.3 Method of Variation of parameters.

Prescribed Text book:				
S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION

1	V.Krishna Murthy	A text book of mathematics for B.A/B.ScVol – I	S-Chand&co	2015

Reference books:				
S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1	Dr. A. Anjaneyulu	A text book of mathematics for B.A/B.ScVol – I	Deepthi Publications	2015
2	RaiSinghania	Ordinary& Partial Differential Equations	S-Chand	2009
3	ZafarAhsan	Differential Equations and their applications	Prentice-Hall of India Pvt Ltd, McGraw Hill	2000

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS &SCIENCE:: VIJAYAWADA-10.

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

STATISTICS	STAP11B	2020 – 21 Onwards	B.A(EMS)/ B.Sc.(MSCs,MSDs&CAMS)

SEMESTER-I **Practical - I** **No of Credits: 2**

DESCRIPTIVE STATISTICS AND PROBABILITY

1. (a) Computation of Measures of Central Tendency (Mean, Median and Mode)

   (b) Computation of Measures of Dispersion (Q.D, M.D and S.D)

2. (a) Computation of non-central and central moments for grouped data.

   (b) Computation of coefficients of Skewness (Karl Pearson's and Bowley's methods)

3. Fitting of (a) straight line (b) parabola by the method of least squares.

4.Fitting of (a) Exponential curves of the type $y = ab^x$ and $y = ae^{bx}$ (b) Power curve by the method of least squares.

5. Computation of correlation coefficient and regression lines for ungrouped data

6. Computation of correlation coefficient and regression lines for grouped data

7. Computation of rank correlation coefficient (a) untied ranks (b) tied ranks

   (c) comparison of more than two groups

8. Computation of Bayesian probabilities

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
	CO1					**H**		
	CO2					**M**		
	CO3					**M**		
	CO4					**L**		
STAT11B	**CO5**					**H**		

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STATISTICS	STAT11B	2020 – 21 Onwards	B.A(EMS)/B.Sc.(MSCs, MSDs&CAMS)

SEMESTER- I **PAPER - I** **No of Credits: 3**

DESCRIPTIVE STATISTICS AND PROBABILITY

S. No	PROGRAMME OUTCOMES
PO1	Remember the basic concepts of statistics at different levels and to understand them for gaining of knowledge.
PO2	Apply the statistical techniques in the analysis of data and also acquire knowledge in optimization techniques.
PO3	Facilitate students to acquire flair knowledge to estimate the values in real life problems.

COURSE OUTCOMES

CO.NO	Upon successful completion of this course, students should have the knowledge and skills to:	Mapping
CO1	Understand the basic concept of Statistics and apply statistical Measures to analyze the data.	**BTL2, PO2**
CO2	Analyze the bi-variate data using statistical techniques.	**BTL4, PO2**
CO3		**BTL4,PO2**
CO4	Apply the probability theory in day to day life in decision making against uncertainty.	**BTL3, PO2**

CO-PO MATRIX								
COURSE CODE	CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
STAT11B	CO1					H		
	CO2					M		
	CO3					M		
	CO4					L		
	CO5					H		

Unit – I

Moments - Central and Non-central moments, inter-relationships, Sheppard's corrections for moments for grouped data.Simple problems

Skewness : Def. and measures of skewness by Karl Pearson's, Bowley's formulae and based on moments. Simple problems

Kurtosis : Def. measurement of kurtosis based on moments, Simple problems.

Unit – II

Correlation - Karl Pearson's correlation coefficient, and Spearman's rank correlation coefficient and their properties.Simple problems

Unit – III

Curve fitting: Principle of least squares, Fitting of straight line, Quadratic, Exponential and Power curves**.** Simple problems

Regression +Analysis: Simple linear regression, Properties of regression coefficients, simple problems

Unit – IV

Probability - Basic Terminology in probability. Mathematical, Statistical and Axiomatic definitions of probability with Merits and demerits. . Addition and Multiplication theorems for 2 and n events, Boole's inequalities.Simple problems

Unit – V

Conditional probability, Bayes' theorem . Simple problems

Text Book: Fundamentals of Mathematical Statistics, 11th Edition, 2010, S. C. Gupta and V. K. Kapoor, Sultan Chand & Sons, New Delhi

List of Reference Books:

1. B.A/B.Sc. First Year Statistics(2010) , Telugu Akademi, Hyderabad.
2. Mathematical Statistics with Applications, 2009, K.M.Ramachandran and Chris P.Tsokos Academic Press(Elsevier), Haryana .

3. Probability and Statistics,Volume I, D.Biswas, New central book Agency (P) Ltd, New Delhi.
4. An outline of Statistical theory, Volume two,3rd Edition,2010(with corrections) A.M.Goon,M.K. Gupta, B.Dasgupta ,The World Press Pvt.Ltd., Kolakota.
5. Sanjay Arora and Bansi Lal:. New Mathematical Statistics, Satya Prakashan , New Delhi.
6. Mathematical Statistics, 3rd edition, 2009, Parimal Mukhopadhyay, Books & Allied(p) Ltd, Kolkata.

Model Paper Structure

Section A: Answer FIVE questions out of EIGHT questions (5 x 5M= 25 M)
Section B: Answer FIVE questions out of FIVE questions with internal choice. (5 x 10M = 50M)

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STATISTICS	**STAT11B**	**2019 – 20 Onwards**	**B.A(EMS) / B.Sc.(MSCs,MSDs& CAMS)**

DESCRIPTIVE STATISTICS AND PROBABILITY

Model Paper

Section – A

Answer any <u>FIVE</u> of the following 5 x 5M = 25Marks

1. ExplainSheppard's correction (L-2, CO-1)
2. Explain Bowley's coefficient of skewness (L-2,CO-1)
3. Explain correlation. What are the types of correlation? (L-2,L-1, CO-1)
4. Write the properties of regression coefficients. (L-1, CO-1)
5. Write a short note on least squares
6. Define the terms (i) Mutually Exclusive (ii) Equally likely events

7. State and prove addition theorem of probability for two events (L-1,L-3, CO-4)

8. If A and B are independent events, then prove that (L-3, CO-4)

$i)\ \bar{A}\ and\ B$ $ii)\ \bar{A}\ and\ \bar{B}$ are also independent

Section – B

Answer ALL questions **5 x 10M = 50Marks**

9. A) Explain the relationship between central and non-central moments(L-2, CO-1)

(OR)

B) Show that the limits for Karl Pearson's coefficient of skewness lies between -3 and +3(L-3, CO-4)

10. A) Fit a straight line of the form $y = a + bx$ to the following data. Estimate the value of y when x = 7(L-3, CO-4)

X	1	2	3	4	5	6
y	18	51	90	120	140	150

(OR)

B) Explain correlation coefficient and their limits are independent of change of origin and scale(L-2,CO-1)

11. A) Define multiple correlation coefficient and state its properties(L-1, CO-1)

(OR)

B) Find the regression equation of $X_1\ on\ X_2\ and\ X_3$ given the following results: (L-3,CO-4)

Trait	Mean	S.D.	r_{12}	r_{23}	r_{31}
X_1	28.02	4.42	0.8		
X_2	4.91	1.1		-0.56	
X_3	594	85			-0.4

Where X_1 = Seed per acre ; X_2 = Rainfall in inches; X_3 = Accumulated temperature

12. A) Calculate Yule's coefficient of association and Yule's coefficient of colligation from the following data (AB) = 60; $(A\beta)$ = 10; $(\alpha B) = 10$; $(\alpha\beta) = 50$(L-3, CO-4)

(OR)

B) Define consistency of data. Give the conditions for consistency of data for 2 & 3 attributes(L-1, CO-1)

13. A)State and prove multiplication theorem of probability for n events(L-1,L-3, CO-4)

(OR)

B) State and prove Baye's theorem(L-1,L-3, CO-4)

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పి.బి. సిద్ధార్థ ఆర్ట్స్ & సైన్స్ కళాశాల (స్వయంప్రతిపత్తి) :: విజయవాడ -10

బి.ఏ., బి.బి.ఏ., బి.కాం., బి.ఎస్సి., బి.సి.ఏ., తదితర ప్రోగ్రాములు

సి.బి.సి.ఎస్. పద్ధతిలో సవరించబడిన పాఠ్యప్రణాళిక

2020-2021 విద్యా సంవత్సరం నుండి

తెలుగు - పాఠ్య ప్రణాళిక

సెమి.	కోర్సు	శీర్షిక	పీరియడ్లు/వారానికి	క్రెడిట్లు	మొత్తం మార్కులు		
					IA	SE	Total
I	I	తెలుగు - I	04	03	25	75	100

(B.A,B.Com-GEN,C.A,A&F,TPP,BPM,BBA,BBA-B.A,BCA,B.Sc&CSCS) EXTRA

కోర్స్ కోడ్:TELT11A **అంశం: తెలుగు** **సెమిస్టర్- I**

కోర్సు-1 : తెలుగు-I

యూనిట్ల సంఖ్య: 5 పీరియడ్ల సంఖ్య: 60

కోర్స్ అవుట్ కంమ్స్ :

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ప్రాచీన తెలుగు సాహిత్యం యొక్క ప్రాచీనతను, విశిష్టతను గుర్తిస్తారు. తెలుగు సాహిత్యంలో ఆదికవి నన్నయ కాలంనాటి భాషాసంస్కృతులను, ఇతిహాసకాలం నాటి రాజనీతి విషయాలపట్ల పరిజ్ఞానాన్ని సంపాదించగలరు.
2. శివకవుల కాలంనాటి మతపరిస్థితులను, భాషా విశేషాలను గ్రహిస్తారు. తెలుగు నుడికారం, సామెతలు, లోకోక్తులు మొదలైన భాషాంశాల పట్ల పరిజ్ఞానాన్ని పొందగలరు.
3. తిక్కన భారతంనాటి మత, ధార్మిక పరిస్థితులను, తిక్కన కవితా శిల్పాన్ని, నాటకీయతను అవగాహన చేసుకోగలరు.
4. పోతన అద్భుత కథాకథన శిల్పం, సజీవపాత్ర చిత్రణ, శబ్దాలంకారాల ప్రయోగం మొదలగు విభిన్న రీతులపట్ల అభిరుచిని పొందగలరు. మొల్ల కవిత్వంలోని వీనుల విందైన పదాలు, పాత్రలు మనోభావాల చిత్రణ గుర్తించగలరు.
5. తెలుగు పద్యం స్వరూప-స్వభావాలను, సాహిత్యాభిరుచిని పెంపొందించుకుంటారు. ప్రాచీన కావ్యభాషలోని వ్యాకరణాంశాలను అధ్యయనం చేయడం ద్వారా భాషా సామర్థ్యాన్ని, రచనలో మెలకువలను గ్రహించగలరు.

లెర్నింగ్ అబ్జెక్టీవ్స్ :

1. తెలుగు భాషాసాహిత్యాల పట్ల ప్రీతి, మమకారం, ప్రాచీన కాలంలోని రాజనీతి పట్ల అవగాహన కల్గుతుంది.
2. ప్రాచీన కాలం నాటి చరిత్ర, సంస్కృతి ఆచార సాంప్రదాయాల పట్ల ఆసక్తి కల్గుతుంది.
3. అలనాటి ధర్మ, మత పరిస్థితులు, నైతిక విలువల పట్ల అవగాహన ఏర్పడుతుంది.
4. పూర్వ కవుల సజీవ పాత్రల సృష్టి, వివిధ శబ్ద ప్రయోగాల పట్ల అభిరుచి కల్గుతుంది.
5. కావ్య భాషలోని భాషా పరిజ్ఞానం, వ్యాకరణాంశాలు, వివిధ రచనలలోని మెలకువలు తెలుసుకుంటారు.

పాఠ్య ప్రణాళిక

యూనిట్-I

రాజనీతి – నన్నయ

మహాభారతము – సభాపర్వం – ప్రథమాశ్వాసంలో 26వ పద్యము "మీవంశమున..... నీవు వారిదైన నేర్పెఱింగి" నుండి 57వ పద్యము "నాయథాశక్తి .... వాని ననుష్ఠితు బ్రియముతోడ" వరకు.

యూనిట్-II

దక్షయజ్ఞం – నన్నెచోడుడ

కుమార సంభవం – ద్వితీయాశ్వాసంలో 49వ వచనం "అంతకమున్ను.... భయంకరా కారంబుదాల్చిన" నుండి 86వ పద్యం " ప్రమథగణము.... కనిరిశంభు" వరకు.

యూనిట్-III

ధౌమ్యధర్మోపదేశము – తిక్కన

మహాభారతము – విరాటపర్వము – ప్రథమాశ్వాసంలో 116వ పద్యం "ఎఱిగెడు వారికినైనను.... వలయు దగియెడు బుద్ధుల్" నుండి 146వ పద్యం "అతడు నియతితోడ .... సంచయములు దగ జపించుచుండె" వరకు.

యూనిట్-IV

మధుర స్నేహం – పోతన

ఆంధ్రమహాభాగవతము – దశమస్కంధము – కుచేలోపాఖ్యానంలో 962వ పద్యం "లలిత పతివ్రతాతిలకంబు... కుపాయమూ హింప వైతి" నుండి 983వ పద్యం "తన మృదుతల్పమందు... ధరణీసురు డెంతటి భాగ్యవంతుడో" వరుకు.

యూనిట్-V

సీతారావణ సంవాదం – మొల్ల

రామాయణము – సుందరకాండములో 40వ వచనం "ఆరామంజూచి.... వృక్షం బారోహించి యందు" నుండి 87వ పద్యం " కావున నిక్కోమలియెడ.... మనకు దిక్కగు మీదన్" వరకు.

వ్యాకరణము:

1. **సంధులు:-** సవర్ణ, గుణ, యణాదేశ, వృద్ధి, అకార, ఇకార, ఉకార, త్రిక సంధులు.
2. **సమాసములు:-** తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి సమాసములు.
3. **ఛందస్సు:-** వృత్త పద్యాల్లో ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము.
   జాతులు, ఉపజాతుల్లో కందము, తేటగీతి, ఆటవెలది మరియు ముత్యాలసరాలు.
4. **అలంకారములు:-** శబ్దాలంకారాల్లో అనుప్రాసాలైన వృత్త్యనుప్రాస, ఛేకానుప్రాస, లాటానుప్రాస, అంత్యాను ప్రాసములు.
   అర్థాలంకారాల్లో ఉపమ, ఉత్ప్రేక్ష, రూపక, శ్లేషలు.

ఆధార గ్రంథాలు:

1. శ్రీమదాంధ్ర మహాభారతము : సభాపర్వము-తిరుమల తిరుపతి దేవస్థానం ప్రచురణ
2. శ్రీమదాంధ్ర మహాభారతము : విరాటపర్వము-తిరుమల తిరుపతి దేవస్థానం ప్రచురణ
3. కుమార సంభవం - నన్నెచోడుడు
4. శ్రీ మహాభాగవతము - పోతన
5. రామాయణము - మొల్ల

SEMESTER– PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE :: VIJAYAWADA-520 010.
(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

TELUGU	**TELT11A**	**2020-2021**	**B.A., B.Com., B.B.A., B.B.A.-Ana, B.Com.-CA, B.C.A., & B.Sc.,**

I **Credits – 3**

ప్రశ్నపత్ర నిర్మాణ సూచిక : TELUGU-I

1. ప్రతిపదార్థ పద్యాలు :	**2–1**	**1×7=7మా,**	**2. సందర్భ సహిత వ్యాఖ్యలు:**	**5–3**	**3×4=12మా**
3. సంగ్రహరూప ప్రశ్నలు :	**5–3**	**3×4=12మా,**	**4. వ్యాసరూప ప్రశ్నలు :**	**5–3**	**3×8=24మా**
5. సంధులు :	**5–3**	**3×2=6మా,**	**6. సమాసములు :**	**5–3**	**3×2=6మా**
7. ఛందస్సు :	**2–1**	**1×4=4మా,**	**8. అలంకారములు :**	**2–1**	**1×4=4మా**
				మొత్తం =	**75మా**

గమనికలు / సూచనలు:

1. **ప్రతిపదార్థ పద్యాలు:–** "రాజనీతి, ధౌమ్యధర్మోపదేశం, మధురస్నేహం" అనే మూడు పాఠాల నుండి రెండు పద్యాలు ఇవ్వాలి. అవి కూడ ఈ క్రింది పద్యాల్లో నుండి రెండు ఇవ్వాలి–

రాజనీతి:

1. ఉత్తమ మధ్యమాధమ .... కాలము దప్పకుండగన్
2. బహుధనధాన్య సంగ్రహము ..... భవత్పరి రక్ష్యములైన దుర్గముల్

ధౌమ్యధర్మోపదేశము:

3. రాజ గృహంబు కంటె ..... దగదట్లు సేయగన్
4. ధరణిపు చక్క ..... నుండుటనీతి కొల్పునన్

మధురస్నేహం:

5. కలలో నందను ..... సంపద్విశేషోన్నతుల్.
6. కనిడాయం జనునంత ..... విలోలుండై దిగెన్ దల్పమున్.

2. **సందర్భసహిత వ్యాఖ్యలు:–** "రాజనీతి, దక్షయజ్ఞం, ధౌమ్యధర్మోపదేశము, మధురస్నేహం, సీతారావణ సంవాదం" అనే ఐదు పాఠాలనుండి ఒకొక్కటి చొప్పున సందర్భసహిత వ్యాఖ్య ఇవ్వాలి.

3. **సంగ్రహరూప ప్రశ్నలు:–** "రాజనీతి, దక్షయజ్ఞం, ధౌమ్యధర్మోపదేశము, మధురస్నేహం, సీతారావణసంవాదం" అనే ఐదు పాఠాల నుండి ఒకొక్కటి చొప్పునొ సంగ్రహరూప ప్రశ్న ఇవ్వాలి.

4. **వ్యాసరూప ప్రశ్నలు:–** "రాజనీతి, దక్షయజ్ఞం, ధౌమ్యధర్మోపదేశము, మధురస్నేహం, సీతారావణసంవాదం" అనే ఐదు పాఠాల నుండి ఒకొక్కటి చొప్పున వ్యాసరూప ప్రశ్న ఇవ్వాలి.

5. **సంధులు:–** "సవర్ణ, గుణ, యణాదేశ, వృద్ధి, అకార, ఇకార, ఉకార, త్రిక" సంధులు నుండి ఐదు సంధులు ఇవ్వాలి.

6. **సమాసములు:–** "తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహువ్రీహి సమాసములు" నుండి ఐదు సమాసములు ఇవ్వాలి.

7. **ఛందస్సు:–** వృత్తపద్యాలైన "ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము"ల నుండి ఒక పద్యపాదమును ఇవ్వాలి.
జాతులు, ఉపజాతుల పద్యాలైన "కందము, తేటగీతి, ఆటవెలది" మరియు 'ముత్యాలసరాలు' నుండి ఏవైన మూడిచ్చి ఒకదానిని లక్ష్యలక్షణ సమన్వయం చేయమనాలి.

8. **అలంకారములు:–** అర్థాలంకారలైన "ఉపమ, ఉత్ప్రేక్ష, రూపకము, శ్లేష"ల నుండి ఒక అలంకారము ఇవ్వాలి. అది కూడ ఐదు పాఠాల (రాజనీతి, దక్షయజ్ఞం, ధౌమ్యధర్మోపదేశము, మధురస్నేహం, సీతారావణసంవాదం) నుండి ఒక పద్యాన్ని ఇవ్వాలి–
శబ్దాలంకారాల నుండి "వృత్తనుప్రాస, ఛేకానుప్రాస, లాటానుప్రాస, అంత్యానుప్రాసా"ల నుండి రెండు అలంకారములు ఇచ్చి, ఒక అలంకారము వ్రాయమనాలి.

ఇక నమూనా ప్రశ్నపత్రాన్ని పరిశీలించి ప్రశ్నపత్రాన్ని తయారు చేసుకోవాలి.

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE::VIJAYAWADA-520010
(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

I Semester Model Question Paper, 2020-21 Batch

No. of Pages: 2	**Roll No.:**	**Max. Marks: 75M**
Time: 3 Hrs.	**No. of Questions: 08**	**Pass Min. : 30M**

I. క్రింది వానిలో <u>ఒకదానికి</u> ప్రతి పదార్థ తాత్పర్యమును వ్రాయండి: 7మా **L1**

1. బహుధనధాన్య సంగ్రహము బాణశరాసన యోధవీర సం
గ్రహము నిరంతరాంతరుదకంబులు ఘాసరసేందనౌఘ సం
గ్రహము ననేక యంత్రములు గల్గియ సాధ్యములై ద్విషద్భయా
వహ లగుచుండ నొప్పునె భవత్పరి రక్ష్యములైన దుర్గముల్.

లేదా

2. కలలోనందను మున్నెఱుంగని మహా కష్టాత్ముడై నట్టి దు
ర్బలు డౌపత్సమయంబునన్ నిజ పదాబ్జాతంబులు ల్లంబులోన్
దలపన్నంతనె మెచ్చి యార్తి హరుడై తన్నైన నిచ్చున్ సు ని
శ్చల భక్తిన్ భజియించువారి కిడడే సంపద్విశేషోన్నతుల్.

II. క్రింది వానిలో <u>మూడింటికి</u> సందర్భసహిత వ్యాఖ్యలు వ్రాయండి: 3 × 4 = 12మా **L2**

1. వార్త నిర్వహింపవలయు బతికి.
2. నన్ను బనుపు దక్షు బట్టి తెచ్చెదన్.
3. పురుషార్థంబునకు హాని పుట్టక యున్నే?
4. గోవింద దర్శనోత్సాహి యగుచు.
5. ఉండు టిది న్యాయమె లతాంగీ !

III. క్రింది వానిలో <u>మూడింటికి</u> సంగ్రహరూప సమాధానాలు వ్రాయండి: 3 × 4 = 12మా **L1**

1. రాజు చేయకూడని పనుల్ని తెల్పండి?
2. ప్రమథులు దక్షుని బంధించిన తీరును తెల్పండి?
3. ధౌమ్యుని ఉపదేశానంతరం ఏమి జరిగింది?
4. అంతఃపురకాంతలు కుచేలుని గూర్చి భావించిన విషయాల్ని తెల్పండి?
5. త్రిజట తన స్వప్నాన్ని ఏమని వివరించెను?

IV. క్రింది వానిలో <u>మూడింటికి</u> వ్యాసరూప సమాధానాలు వ్రాయండి: 3 × 8 = 24మా **L1**

1. ప్రజాపాలనలో రాజులు పాటించాల్సిన ధర్మాలేవి?
2. 'దక్షయజ్ఞం' సారాంశాన్ని వ్రాయండి.
3. ధౌమ్యుడు పాండవులకు చేసిన ధర్మోపదేశాన్ని వివరించండి
4. 'మధురస్నేహం' పాఠ్య సారాంశాన్ని తెల్పండి?
5. సీతారావణ సంవాదాన్ని వివరించండి.

V. క్రింది వానిలో <u>మూడింటిని</u> విడదీసి, సంధి కార్యము వ్రాయండి: 3 × 2 = 6మా **L3**

1. శతైకవృద్ధి 2. జగమెల్ల 3. మనుజేంద్రుడు
4. కష్టాత్ముడు 5. ఇక్కోమలి

VI. క్రింది వానిలో <u>మూడింటికి</u> విగ్రహ వాక్యాలు వ్రాసి, సమాస నామములు తెల్పండి: 3×2=6మా **L3**

1. అష్టాంగాలు 2. అశ్రమము 3. భీమార్జునులు2
4. మధురస్నేహం 5. తోయజాక్షి

VII. క్రింది పద్య పాదాన్ని గణ విభజన చేసి, యతిని గుర్తించి, ఏ పద్యపాదమో తెల్పండి: 1×4=4మా **L3**

తన మృదుతల్పమందు వనితామణియైన రమాలలామ పొం

లేదా

క్రింది వానిలో <u>ఒకదానికి</u> లక్ష్య, లక్షణ సమన్వయం చేయండి. **L1**

1. తేటగీతి 2. ముత్యాలసరాలు 3. ఆటవెలది

VIII. క్రింది పద్యంలోని అలంకారమును గుర్తించి, లక్ష్య లక్షణ సమన్వయం చేయండి: 1×4=4మా **L3**

బాల సఖుడైన యప్పద్మ పత్రనేత్రు
గాన నేగి దరిద్రాంధకార మగ్ను
లయిన మము నుద్ధరింపుము హరి కృపాక
టాక్ష రవిదీప్తి వడసి మహాత్మ! నీవు.

లేదా

క్రింది వానిలో <u>ఒకదానికి</u> లక్ష్య, లక్షణ సమన్వయం చేయండి. **L1**

1. వృత్త్యాను ప్రాసము 2. లాటానుప్రాసము

P. B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE: VIJAYAWADA-10.
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Semester II	Course Code	Course Title	Hours	Credits
BSC(MPCS/MECS/CAME/MSCS /CAMS/CSCS/BCA)	CSCP21B	Data Structures Lab	30	1

COURSE OUTCOME NO	Upon successful completion of this course, students should have the knowledge and skills to:	PROGRAM OUTCOME NO
CO1	implement stacks, queues using arrays and linked lists.	PO1, PSO1, PSO2, PSO4
CO2	Write program for conversion from infix to postfix.	PO1, PSO1, PSO2, PSO4
CO3	implement different sorting and searching techniques.	PO 7, PSO1, PSO2, PSO4
CO4	Construct binary trees and binary search trees.	PO 1, PSO1, PSO2, PSO4
CO5	implement binary tree and Graph traversals.	PO1, PO 7, PSO1, PSO2, PSO4

		CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Course Code: CSCP21A	Title of the Course: DATA STRUCTURES LAB	CO1					M	L	M
		CO2					L	M	L
		CO3					M	L	L
		CO4					L	M	L
		CO5					M	L	L

Lab Experiments List

Cycle - I

Week 1: Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array

- Add an element at the beginning of an array
- Insert an element at given index of array
- Update a element using a values and index
- Delete an existing element

Week 2: Write Program to implement the Stack operations using an array.

Week 3: Write a program using stacks to convert a given infix expression to postfix.

Week 4: Write a program for arithmetic expression evaluation.

Week 5: Write Program to implement the Stack operations using Linked List.

Week 6: Write Program to implement the Queue operations using an array.

Week 7: Write Program to implement the Queue operations using Liked List.

Week 8: Write Program to implement circular Queue operations using an array.

Cycle - II

Week 9: Write a program to implement de-queues.

Week 10: Write a program to implement single linked list.

Week 11: Write a program to implement double linked list.

Week 12: Write a program for Binary Search Tree Traversals.

Week 13: Write a program to search an item in a given list using the following Searching Algorithms

- Linear Search
- Binary Search.

Week 14: Write a program for implementation of the following Sorting Algorithms

- Bubble Sort
- Insertion Sort

- Merge sort

Week 15: Write a program for implementation of the following graph traversals.

- BFS
- DFS

@@@@

P. B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE: VIJAYAWADA-10.
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Semester-II	Course Code	Course Title	Hours	Credits
B.Sc. (CAMS / CAME / MSCS / CSCS / MPCS / MECS/), BCA	**CSCT21B**	**Data Structures**	**60**	**4**

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

Course Outcomes:

Course Outcome No	Upon successful completion of the course, student will be able to:	Program Outcome No
CO1	Learn the concepts of ADT and understand analysis of algorithms	PO1, PSO1, PSO2, PSO4
CO2	Understand available Data Structures for data storage and processing.	PO1, PSO1, PSO2, PSO4
CO3	Learn stacks, queues and their applications	PO1, PSO1, PSO2, PSO4
CO4	Understand trees, graphs and implement their operations	PO1, PO7, PSO1, PSO2, PSO4
CO5	Develop ability to implement different Sorting and Search methods	PO1, PO7, PSO1, PSO2, PSO4

		CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Course Code: CSCT21A	Title of the Course: DATA STRUCTURES	CO1						M	H
		CO2						H	L
		CO3						M	H
		CO4						H	L
		CO5						L	M

UNIT – I: **11Periods**

Introduction to Data Structures: Introduction to the Theory of Data Structures, Data Representation, Abstract Data Types, Data Types, Primitive Data Types, Data Structure and Structured Type, Atomic Type, Difference between Abstract Data Types, Data Types, and Data Structures, Refinement Stages.

Principles of Programming and Analysis of Algorithms: Software Engineering, Program Design, Algorithms, Different Approaches to Designing an Algorithm, Complexity, Big 'O'

Notation, Algorithm Analysis, Recursion.

UNIT – II: **11Periods**

Linked Lists: Introduction to Lists and Linked Lists, Basic Linked List Operations, Doubly Linked List, Circular Linked List, Atomic Linked List, Linked List in Arrays, Linked List versus Arrays

UNIT – III: **14Periods**

Stacks: Introduction to Stacks, Stack as an Abstract Data Type, Representation of Stacks through Arrays, Representation of Stacks through Linked Lists, Applications of Stacks, Stacks and Recursion

Queues: Introduction, Queue as an Abstract data Type, Representation of Queues, Circular Queues, Double Ended Queues- Deques, Priority Queues, Application of Queues

UNIT – IV: **10Periods**

Binary Trees: Introduction to Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Counting Number of nodes in Binary Trees, Applications of Binary Tree

UNIT – V: **14Periods**

Searching and sorting: Sorting – An Introduction, Bubble Sort, Insertion Sort, Merge Sort, searching – An Introduction, Linear or Sequential Search, Binary Search, Indexed Sequential Search

Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs, Spanning Trees, Shortest Path, Application of Graphs.

BOOKS:

- "Data Structures using C", ISRD group Second Edition,TMH
- Data Structures through C", YashavantKanetkar, BPBPublications
- "Data Structures Using C" Balagurusamy E.TMH

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual andchallenging)
2. Student seminars (on topics of the syllabus and related aspects (individualactivity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups asteams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. General

1. Group Discussion

2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work.

P. B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE: VIJAYAWADA-10.
(An Autonomous college in the jurisdiction of Krishna University, Machilipatnam)
MODEL Question Paper: 2020-2021

TITLE: DATA STRUCTURES **COURSE CODE:CSCT21B**

SECTIONS: B.Sc. (CAMS / CAME / MSCS / CSCS / MPCS / MECS /BCA) **SEMESTER: II**

TIME: 3 Hrs. **MAX: 75M**

SECTION –A

ANSWER ANY FIVE QUESTIONS **5 X 5 =25 M.**

1. What is an ADT? Explain with an example. **{CO_1, L2}**
2. Explain about algorithm analysis. **{CO1, L2}**
3. Distinguish between linked lists and arrays. **{CO2, L2}**
4. Evaluate the postfix expression **2 3 1 * + 9 -. {CO3, L5}**
5. Explain about min and max priority queues**. {CO3, L2}**
6. Construct binary tree from the following in order and pre order traversals
   In order: D B E A F C

   Pre order: A B D E C F {**CO4, L3}**
7. Explain various representations of graphs with your own example. **{CO5, L2}**
8. Develop a C program for linear search. **{CO5, L3}**

SECTION – B

ANSWER ALL THE QUESTIONS **5 X 10 =50 M.**

9 A) Explain about Data structure, structured type and atomic type. **{CO1, L2}**

(Or)

B) Explain about Time Complexity and Space Complexity. **{CO1, L2}**

10 A) Explain about inserting and deleting a node in double linked list.**{CO2, L2}**

(Or)

B) Explain about insertion in atomic node linked list. **{CO2, L2}**

11A) Develop a C program for stack's using arrays. **{CO3, L3}**

(Or)

B) Develop a C program for circular queues. **{CO3, L3}**

12 A) Explain about binary tree traversals with an example. **{CO4, L2}**

(Or)

B) Demonstrate with an example deleting a node in a binary search tree. **{CO4, L2}**

13 A) Illustrate Merge sort with an example and write code for it. **{CO5, L2}**

(Or)

B) Illustrate Depth First search with an example. **{CO5, L2}**

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ParvathaneniBrahmayya Siddhartha College of Arts & Science, Vijayawada-10
(An Autonomous College under the jurisdiction of Krishna University)
Reaccredited at the level 'A+' by the NAAC
College with Potential for Excellence
(Awarded by UGC)
DEPARTMENT OF ENGLISH
GENERAL ENGLISH SYLLABUS FOR B.A/ B.COM/B.SC COURSES UNDER CBCS
SEMESTER-II

COURSE CODE: ENGT21B **Max. Marks: 100**
No. of Hours per Week: 4 **External: 75M**
No. of Credits: 3 **Internal: 25M**

English Praxis Course-II

A Course in Reading & Writing Skills

I. UNIT

Prose: 1. How to Avoid Foolish Opinions	Bertrand Russell	12
Skills: 2. Vocabulary: Conversion of Words		
: 3. One Word Substitutes		
: 4. Collocations		

II. UNIT

Prose: 1. The Doll's House	Katherine Mansfield	
Poetry: 2. Ode to the West Wind	P B Shelley	
Non-Detailed Tex: 3. Florence Nightingale	Abrar Mohsin	12
Skill: 4. Skimming and Scanning		

III. UNIT

Prose: 1. The Night Train at Deoli	Ruskin Bond	
Poetry: 2. Upagupta	Rabindranath Tagore	12
Skill: 3. Reading Comprehension		
: 4. Note Making/Taking		

IV. UNIT

Poetry: 1. Coromandel Fishers	Sarojini Naidu	12
Skill: 2. Expansion of Ideas		
: 3. Notices, Agendas and Minutes		

V.UNIT

Non-Detailed Text : 1. An Astrologer's Day	R K Narayan	12

Skills: 2. Curriculum Vitae and Resume
Total: 60 hrs.
: 3. Letters
: 4. E-Correspondence

DEPARTMENT OF ENGLISH

GENERAL ENGLISH SYLLABUS FOR B.A/ B.COM/B.SC COURSES UNDER CBCS

SEMESTER-II

COURSE CODE: ENGT21B **Max. Marks: 100**

No. of Hours per Week: 4 **External: 75M**

No. of Credits: 3 **Internal: 25M**

Course Structure and Syllabi under CBCS

Sl No.	Semester	Course Code	Name Of The Subject	Teaching Hours	Credits
1	**II Semester**	**ENGT21B**	**English praxis -II**	4	3

OBJECTIVE: The main objective of this course is to facilitate the learners to acquire the linguistic competence essentially required in a variety of life situations and develop their intellectual, personal and professional abilities.

COURSE OUT COMES:

At the end of the course the learners will be able to:

CO 1. Acquaint the learner with some widely used words which appeal to be similar but are semantically different and also help them to realize the importance of meanings, and understand the grammatical structures in writing. **PO7**

CO 2. Speak clearly, effectively and appropriately with correct pronunciation, pause and articulation of voice for a variety of audiences and purposes. **PO2**

CO 3. Analyze, interpret, appreciate and comprehend the specified text and the contexts in terms of their content, purpose, and form. **PO1**

CO 4. Think critically; convey their own interpretations, perspectives, producing new creative and artistic works following grammatical structures in oral and written assignment. **PO7**

CO 5. Write effectively for a variety of professional and social settings adapting other writer's ideas as they explore and develop their own. **PO3**

CO-PO MATRIX- ENG T21B							
CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M						
CO2			M				
CO3		H					
CO4							H
CO5							H

PARVATHANENIBRAHMAIAH SIDDHARTHA COLLEGE OF ARTS AND SCIENCE; VIJAYAWADA-10

(An autonomous college in the jurisdiction of Krishna University)

SEMESTER- II **PAPER - II**

TITLE OF THE PAPER: HINDI-II

NO OF HOURS: 60 **CREDITS: 03**

WEF: 2021-22 **COURSE CODE: HINT21A**

COURSE OUTCOMES:

1.मानव मूल्यों से विद्यार्थी अवगत होंगे तथा इस दिशा में आगे बढ़ेंगे।

2.आधुनिक युग की भावनाओं को पहचानकर,निरंतर सामाजिक समस्याओं का सामना करते हुए,आगे बढ़ेंगे।

3.विषय के विश्लेषण से सामाजिक दायित्व को निभाने में अग्रसर होंगे।

4.ग्रहण किये गये पाठ्यांशों के द्वारा विद्यार्थियों का ज्ञान मापन बढ़ेगा तथा अपने क्षेत्र में भी आगे होंगे

5.भाषा की प्रवीणता और प्रयोग से विद्यार्थी उज्वल भविष्य की ओर बढ़ेंगे।

PARVATHANENIBRAHMAIAH SIDDHARTHA COLLEGE OF ARTS AND SCIENCE; VIJAYAWADA-10

(An autonomous college in the jurisdiction of Krishna University)

SEMESTER- II **PAPER - II**

TITLE OF THE PAPER: HINDI-II

NO OF HOURS: 60 **CREDITS: 03**

WEF: 2021-22 **COURSE CODE: HINT21A**

SYLLABUS:

I.गध्य संदेश:

1. संस्कृति औरसाहित्य का परस्पर संबंध
2. भारत एक है
3. एच.आई.वी. / एड्स

II. कथा लोक

1. ज़रिया
2. भूख हड़ताल
3. परमात्मा का कुत्ता

III.कार्यालयीन हिन्दी शब्दावली

(हिन्दी से अंग्रेजी में बदलना तथा अंग्रेजी से हिन्दी में बदलना)

IV. **व्याकरण:** संधि विच्छेद ,वाक्य प्रयोग

V.**पत्र लेखन:** आवेदन पत्र,पुस्तक विक्रेता के नाम पत्र

Recommended Books:

1. गध्य संदेश- Dr. V. L.Narasimham Siva Koti

2. कथा लोक- Dr. Ghana Shyam

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS &SCIENCE :: VIJAYAWADA-520 010.

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

II SEMESTER Model Question Paper

Course Code: HINT21A **Max. Marks: 70M**

Time: 3 Hrs. **Pass Min. : 30M**

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SECTION-I

निम्नलिखित प्रश्नों का उत्तर लिखिए।

4×5=20

1. (a) भारत की मध्यकालीन संस्कृति कैसी रही है? L1

(अथवा)

(b) विविधता के भीतर भारत की एकता कैसे समायी हुई है? स्पष्ट कीजिए। L1

2. (c) एच.आई.वी./ एड्स के लक्षणों पर प्रकाश डालिए। L2

(अथवा)

(d) "अधेड आदमी" चरित्र चित्रण कीजिए। L2

3. (e) "ज़रिया" कहानी का उद्धेश्य क्या है? L2

(अथवा)

(f) "भूख हड़ताल" की विशेषताएँ क्या-क्या हैं? L2

4. (g) अनुवाद किसे कहते हैं ?L1

(अथवा)

(h) संधि किसे कहते हैं तथा उसके कितने प्रकार के हैं ?L1

SECTION-II

1×10=10

1. (a) एच.आई.वी./ एड्स के इतिहास पर प्रकाश डालिए।L2

(अथवा)

(b) 'भारत एक है' पाठ का सारांश लिखिए। L2

SECTION-III **1×10=10**

6. (a) "ज़रिया" कहानी का सारांश लिखिए। L2

(अथवा)

(b) "भूख हड़ताल" कहानी का सारांश लिखिए। L2

SECTION-IV

7.(a) **किन्हीं दस शब्दों को अंग्रेजी से हिंदी मेंअनुवाद कीजिए। L1**

10×1=10

1.Camp Office 2.Embassy 3.Muncipal Corporation 4.Governor 5.Applicant
6.Charge 7.Absence 8.Supervisor 9.Court 10. Building division 11.District board 12.Cash section 13. Branch office 14.Complaint office
15.Enquiry office

(अथवा)

(b) **किन्हीं दस शब्दों को हिंदी से अंग्रेजी में अनुवाद कीजिए।L1**

1.प्रशासनअधिकारी 2.विज्ञापन 3.लेखा परीक्षक 4.प्राचार्य 5.स्वीकार करना
6.अतिथि गृह 7.प्रयोगशाला 8.हृदय-रोग विभाग 9.जिला बोर्ड 10.कलक्टरी
11.सिविल न्यायालय 12.वन विभाग 13.प्रसारण केन्द्र 14.बजट अनुभाग
15.अस्पताल

8.(a) **किन्हीं पाँच शब्दों का संधि विच्छेद कीजिए।L3**

5×2=10

1.रामावतार 2.परमौषध 3.यद्यपि 4.गायक
5.उन्नति 6.प्रत्येक 7.यशोधरा 8.निराशा

(अथवा)

(b) **किन्हीं पाँच शब्दों को वाक्यों में प्रयोग कीजिए। L3**

1.विरासत 2.अज्ञानांधकार 3.इकट्ठा करना 4.बसर करना
5.दुर्भिक्ष 6.पथ प्रदर्शक 7.हवन 8.चिरस्थाई

SECTION-V

1×10=10

9. (a) अनुवादक की नौकरी के लिए प्रबन्धक के नाम पत्र लिखिए। L3

(अथवा)

(b) किसी पुस्तक विक्रेता के नाम पत्र लिखिए। L3

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Department of Mathematics

COURSE STRUCTURE

Sem	Course Code	Paper	Title of the Paper	Total Marks	Internal Exam	Sem.End Exam	Teaching Hours	Credits
II	MAT T21B	CORE	REAL ANALYSIS	100	30	70	6	5

Programme Outcomes

S. No	P.O
	At the end of the Programme the student will be able to:
1	Demonstrate the ability to use mathematical skills such as formulating and tackling mathematics related problems and identifying and applying approximate physical principles and methodologies to solve a wide range of problems associated with mathematics.
2	Apply the underlying unifying structures of mathematics and the relationships among them.
3	Investigate and apply mathematical problems and solutions in variety of contexts related to science and technology, business and industry.

Course Outcomes of MAT T21B

S. No	C.O Upon successful completion of this course, students should have the knowledge and skills to:	Mapping
1	Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate the limit of a bounded sequence.	L2, PO –1,2
2	Apply the Ratio, Root, Alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.	L3, PO – 1
3	Calculate the limit and examine the continuity of a function at a point.	L2,PO – 1
4	Understand the consequences of various mean value theorems for differentiable functions.	L3, PO – 1
5	Determine the Riemann integrability and the Riemann-Stieltjes integrability of a bounded function and prove a selection of theorems concerning integration.	L3, PO – 1

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS &SCIENCE:: VIJAYAWADA-10.

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

MATHEMATICS	**MAT T21B**	**2021-2022 onwards**	**B.A(EMS), B.Sc. (MPC, MPCS, MECS, CAME, CAMS, MSCS)**

REAL ANALYSIS

SEMESTER-II **No of Credits: 5**

OBJECTIVE: TO ENHANCE THE ANALYTICAL SKILLS DATA EVALUATIONAL SKILLS AND LOGICAL THINKINGNESS OF THE STUDENT.

UNIT-I: SEQUENCES (18 Hrs)

1.1 Sequences, Range of sequences, Subsequences, Bounded sequences

1.2 Limit of a sequences, convergent sequences, Divergent and oscillatory sequences.

1.3 sandwich Theorem and related problems.

1.4 monotonic sequences – theorems – related problems.

1.5 Bolzano Weistrass theorem – related problems.

1.6 Cauchy sequences, Cauchy general principle of convergence – Related problems.

1.7 Cauchy's first theorem of limits, Corollary of Cauchy's first theorem on limits, related problems, Cauchy's second theorem on limits and related problems.

UNIT-II: INFINITE SERIES (18 Hrs)

2.1 Introduction to Infinite Series, behaviour of the series, Cauchy's general principle of convergence for series,

2.2 series of non-negative terms, Geometric series, Auxiliary series

2.3 Comparison test of first type, second type, Limit Comparison test – Related Problems.

2.4 Cauchy's nth root test – Related problems.

2.5 D'Alembert's ratio test and their problems,

2.6 Alternating series, Leibnitz's test and Problems.

2.7 Absolute convergent series, conditionally convergent series.

UNIT-III: LIMITS AND CONTINUITY **(18 Hrs)**

3.1 Limit of a function, algebra of limits

3.2 Sandwich theorem, limits at infinity – Problems.

3.3 continuity of a function at a point and on an interval, Algebra of continuous functions,

3.4 Standard theorems on Continuous functions.

3.5 Uniform Continuity definition – theorems – problems.

UNIT-IV: DIFFERENTIATION **(18 Hrs)**

4.1 Derivative of a function on an interval at a point, Algebra of derivative functions

4.2 Increasing and decreasing functions definition and problems

4.3 Darboux's theorem, Rolle'sTheorem, Lagrange's mean value theorem, Cauchy's mean value theorem and their problems,

UNIT-V: RIEMANN INTEGRATION **(18 Hrs)**

5.1 Introduction, partitions, lower and upper Riemann sums – Properties and problems.

5.5 Lower and Upper Riemann Integrals, Darboux's theorem, Riemann Integrability

5.7 Necessary and sufficient condition for R-Integrability and problems

5.8 Algebra of integrable functions.

5.10 Fundamental theorem of integral calculus and problems.

5.11 Integral as the limit of a sum and problems.

5.12 Mean value theorems of integral calculus.

Student Activities:

1) **Class-room activities:** Power point presentations, Assignments
2) **Library activities:** Visit to library and preparation of notes for Assignment problems.
3) **Activities in the Seminars, workshops and conferences:** Participation/presentation in seminar/workshop/conference.

CO-CURRICULAR ACTIVITES:

- Quiz Competitions, Seminars
- Group Discussions

WEB LINKS:

https://drive.google.com/file/d/1BPWJAS6NqSxmYt2VMShpEEM4z52_pbW_/view?usp=sharing
https://drive.google.com/file/d/1oFNosFs8JWqB2pKGqpYtgauRI3BGtJBB/view?usp=sharing

Prescribed Text books:				
S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1	BVSS Sharma, S. AnjaneyaSastry& N. Krishna Murthy	A text book of mathematics for B.A/B.ScVol – II	S-Chand Company Ltd.	2014

Reference books:				
S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1	Dr.A. Anjaneyulu	A text book of mathematics for B.A/B.ScVol – I	Deepthi Publications	2015

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE:: VIJAYAWADA-10.

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SEMESTER – II
Model Paper

COURSE CODE : MAT TT21B

TITLE OF THE PAPER : REAL ANALYSIS

Time: 3hrs. **Max. Marks: 70**

Answer ALL Questions

SECTION – A (5 x 4 = 20 Marks)

1. (a) Prove that every convergent sequence is bounded. (CO1,L1)

   (OR)

   (b) Prove that a convergence sequence has a unique limit. (CO1,L1)

2. (a) If $\sum U_n$ converges then show that $\lim_{x\to\infty} U_n = 0$ (CO2,L1)

   (OR)

   (b) Test for convergence of $\sum_{n=1}^{\infty} \frac{\sqrt{n}}{n^2+1}$ (CO2,L1)

3. (a) Prove that $\lim_{x\to 0} \frac{3x+|x|}{7x-5|x|}$ does not exist. (CO3,L1)

   (OR)

   (b) If $f(x) = \sin\frac{1}{x}$, $\forall x \in R-\{0\}$. Prove that $\lim_{x\to 0} \sin\frac{1}{x}$ does not exist. (CO3,L1)

4. (a) Find 'C' of Cauchy's mean value theorem $f(x) = \frac{1}{x^2}, g(x) = \frac{1}{x}$ on $[a,b] a,b > 0$ (CO4,L2)

   (OR)

   (b) Prove that $f(x) = \frac{x}{\sin x}$ is increasing in $\left[0, \frac{\pi}{2}\right]$ (CO4,L2)

5. (a) If $f(x) = x$ on [0, 1] and $P = \left\{0, \frac{1}{4}, \frac{2}{4}, \frac{3}{4}, 1\right\}$ compute L(p,f) and U(p,f). (CO5,L2)

   (OR)

   (b) Prove that every constant function is Riemann integrable on [a, b]. (CO5,L2)

Answer ALL Questions

SECTION – B (5 x 10 = 50 Marks)

6. (a) If $S_n = \frac{1}{n+1} + \frac{1}{n+2} + ... + \frac{1}{n+n}$ then show that $\{S_n\}$ is convergent. (CO1, L2)

   (OR)

   (b) State and Prove Cauchy's general principle of convergence for sequences. (CO1,L2)

(P.T.O)

7. (a) State and Prove D'Alembert's ratio test. (CO2,L3)

(OR)

(b) Show that the Series $\sum_{n=1}^{\infty}(-1)^n\left(\sqrt{n^2+1}-n\right)$ is conditionally convergent. (CO2,L3)

8. (a) Prove that if $f:S\to R$ is uniformly continuous then f is continuous in S. Is the converse true? Justify your answer. (CO3,L2)

(OR)

(b) Examine for continuity the function $f(x)=|x|+|x-1|$ at $x=1$ (CO3,L2)

9. (a) State and Prove Rolle's Theorem. (CO4,L3)

(OR)

(b) Show that $\frac{v-u}{1+v^2}<\tan^{-1}v-\tan^{-1}u<\frac{v-u}{1+v^2}$ $for 0<u<v$. Hence deduce that

$\frac{\pi}{4}+\frac{3}{25}<\tan^{-1}\frac{4}{3}<\frac{\pi}{4}+\frac{1}{6}$ (CO4,L3)

10. (a) Show that $f(x)=3x+1$ is integrable on $[1,2]$ and $\int_1^2(3x+1)dx=\frac{11}{2}$ (CO5,L3)

(OR)

(b) Prove that every continuous function in [a, b] is Riemann Integrable. (CO5,L3)

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P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous -ISO 9001 – 2015 Certified

Title of the Course: Probability Distributions and Statistical Methods Lab

Offered to: BA (E.M. S) & B.SC (M.S. Cs, M.S. Ca&M.S.Ds.) **Course Code: STAP21C**

Course Type: Core (P) **Year of Introduction: 2019-2020**

Year of Revision: 2021-22 **Percentage of Revision: 60%**

Semester: II **Credits: 1**

Hours Taught: 30periods **Max.Time: 2** Hours

Course Prerequisites (if any): Nil

S. No	Programme Outcomes
PO1.	**Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology
PO2.	**Effective Citizenship**: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO3.	**Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO4.	**Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development
PO5.	**Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO6:	**Specialized Skills / Transferable Skills:** Acquisition of communication and soft, analytical and technological skills that aid in enhancing
PO7.	**Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Programme Outcomes Mapping**
CO 1	To fit a data into various theoretical probability distributions.	PO – 5

CO 2	Apply and Analyze the qualitative data	PO – 6
CO3	Identify the relations between the variables and estimate.	PO - 7

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
	CO1						**H**	
	CO2					**M**		
	CO3						**M**	
	CO4					**H**		
STAP21C	**CO5**					**H**		

List of Practicals

1. (a) Fitting of Binomial distribution (Direct Method). (CO – 1)
   (b) Fitting of Binomial distribution (Recurrence Method).(CO – 1)
2. (a) Fitting of Poisson distribution (Direct Method).(CO – 1)
   (b) Fitting of Poisson distribution (Recurrence Method). (CO – 1)
3. (a) Fitting of Normal distribution (Areas Method). (CO – 1)
   (b) Fitting of Normal distribution (Ordinates Method). (CO – 1)
4. Computation of Yule's coefficient of association. (CO – 2)
5. Computation of Pearson's and Tcherprows coefficient of contingency(CO – 2)
6. (a) Computation of correlation coefficient for ungrouped data. (CO – 3)
   (b) Computation of correlation coefficient for grouped data. (CO – 3)
7. (a) Fitting of a straight line by the method of least squares. (CO – 3)
   (b) Fitting of a parabola by the method of least squares. (CO – 3)
   (c) Fitting of power curve $y = ax^b$ by the method of least squares. (CO – 3)
   (d) Fitting of exponential curves $y = ae^{bx}$ & $y = ab^x$ by the method of least squares.(CO-3)
8. (a) Construction of regression lines for the ungrouped data. (CO – 3)
   (b) Construction of regression lines for the grouped data.(CO – 3)

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Structure of Practical Paper

Total Marks: 50 Marks

(i) For Continuous Evaluation	**:**	**15 marks (Internal Evaluation)**
(ii) For semester end Practical Examination	**:**	**35 marks (External Evaluation)**

P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous -ISO 9001 – 2015 Certified

Title of the Course :Probability Distributions and Statistical Methods

Offered to: BA (EMS) & B.SC (MSCs, M.S.Ca &M.S.Ds)**Course Code : STAT21C**

Course Type: Core (Theory) **Year of Introduction: 2019-20**

Year of Revision : 2021-22 **Percentage of Revision: 60%**

Semester: II **Credits: 4**

Hours Taught: 60 periods **Max.Time:** 3 Hours

Course Prerequisites: Students required basic knowledge in Calculus, Algebra and Probability.

Course Description: This course helps the students to familiarize students with the ways in which we talk about uncertainty and look at everyday situations in which probability arises. Also this course aims at providing basic knowledge about theoretical distribution models that can suit different phenomena of interest measured as variables in a continuum.

Course Objectives:

1) To enable the students to develop basic knowledge in theoreticalProbability distributions
2) To provide understanding and applying standard continuous probability distribution to different situations.
3) To get the knowledge regarding qualitative factors
4) To understand the relation between quantitative factors
5) To make the estimated values using regression

Learning Outcomes: At the end of the course, the student will

1) Acumen to apply standard discrete probability distribution to different situations.
2) ability to handle transformed random variables and derive associated distributions.
3) The parameters describe an underlying physical setting in such a way that their value affects the distribution of the measured data.

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Programme Outcomes Mapping**
CO 1	Develop the basic knowledge in Probability distribution and uncertainty conditions we apply standard discrete probability distributions to identify the probability values.	PO - 5

CO 2	Obtained the knowledge of applications on standard continuous distributions. Also get the knowledge in respect of usage in day-to-day life.	PO - 5
CO3	Analyse the qualitative data	PO - 6
CO 4	Statistically analyze the strengths of relationship between variables.	PO - 7
CO 5	To outline the vital area of regression models applicable in a wide variety of real time situations	PO - 7

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
	CO1					**H**		
	CO2					**M**		
	CO3						**L**	
	CO4							**M**
STAT21C	**CO5**							**M**

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Theoretical Probability Discrete Distributions** Rectangular, Binomial, Poisson, Negative Binomial, Geometric, Hyper Geometric distributions: Definitions, Means, Variances, M.G.F, C.G.F, P.G.F, additive property,limiting cases, memory less property if exists . Simple problems.	**12**
II	**Theoretical Probability Continuous Distributions** Rectangular, Normal, Exponential, Gamma, Beta Distributions: Definitions, Means, Variances, M.G.F, C.G.F, P.G.F, additive property,limiting cases, memory less property if exists . Simple problems.	**12**
III	**Theory of Attributes**: Notations, Dichotomy classification, class and class frequencies, order of classes and class frequencies. Ultimate class frequencies, relation between class frequencies. Consistency of data - Conditions for consistency of data for 2 and 3 attributes only. Independence of attributes- criterion of independence of two attributes. Association of attributes-Yule's coefficient of association and coefficient of colligation. Relationship between coefficient of	**12**

	association and colligation and simple problems.	
IV	**Correlation**: Meaning, Types of Correlation, Measures of Correlation- Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems. **Multiple and Partial Correlation**- Coefficients of multiple and partial correlations, properties of multiple and multiple correlation coefficients, coefficient of multiple determination. simple problems	**12**
V	**Curve fitting** Principle of least squares, fitting of straight line, fitting of second degree polynomial or parabola. Fitting of power curve and exponential curves. **Regression Analysis**: Introduction, Linear Regression- Regression coefficients, properties of regression coefficients, angle between two lines of regression. Standard error of estimate (residual variance), Explained and unexplained variation, coefficient of determination and simple problems	**12**

Text Book:

Fundamentals of Mathematical Statistics, 12th Edition, Sep 2020, S. C. Gupta and V. K. Kapoor, Sultan Chand & Sons, New Delhi

Reference Books:

1.B.A/B.Sc. Second Year Statistics(2010) , Telugu Akademi, Hyderabad.

2. Mathematical Statistics with Applications, 2009, K.M.Ramachandran and Chris P.Tsokos Academic Press(Elsevier), Haryana .

3.Probability and Statistics, Volume I & II, D. Biswas, New central book Agency (P) Ltd, NewDelhi.

4. An outline of Statistical theory, Volume II,3rd Edition,2010(with corrections) A.M.Goon,M.K. Gupta, B.Dasgupta ,The World Press Pvt.Ltd., Kolakota.

5.Sanjay Arora and BansiLal:. New Mathematical Statistics, SatyaPrakashan , New Delhi.

Websites of Interest: **http://onlinestatbook.com/rvls/index.html**

Co-Curricular Activities in the class:

1. Pictionary
2. Case Studies on topics in field of statistics
3. Snap test and Open Book test
4. Architectural – To be build the procedures
5. Extempore – Random concept to students
6. Interactive Sessions
7. Teaching through real world examples

***

Model Question Paper

Max.: 75 Marks **STAT21C** **Min.Pass : 30 Marks**

Model Paper

Section A

Answer any FIVE of the following **5 x 5M = 25M**

1. In Binomial distribution mean and variance are 4 and 3 respectively. Find mode of the distribution. (Co – 1, L - 1)
2. Show that in Poisson distribution mean and variance are equal. (Co – 1, L - 6)
3. Write the properties of normal distribution. (Co – 2, L - 4)
4. Obtain the mean and variance of Beta distribution of 2^{nd} kind. (Co – 2, L - 5)
5. Explain the types of correlation. (Co – 4, L - 2)
6. Define class and class frequency of an attribute with examples. (Co – 3, L - 1)
7. Write the properties of regression coefficients. (Co – 5, L - 4)
8. Explain the concept of rank correlation. (Co – 4, L - 2)

Section – B

Answer the following **5 x 10M =50M**

9. a) Define Binomial distribution and derive the recurrence relation forcentral moments.

(Co – 1, L - 1)

(OR)

b) (i) A book contain 43 mistakes in 585 pages. Find the probabilitythat there will be no
mistake in randomly selected 10pages of thebook.

(ii) If a Poisson distribution such that 3P(x=1) = 2P(x=3). Find P(2≤X≤5) (Co – 1, L - 1)

10. a) Show that mean, median and mode are equal in Normal distribution. (Co – 2, L - 6)

(OR)

b) In a distribution exactly normal, 7% of the items are under 35and 89% are under 63. What
are the mean and standard deviationof the distribution. (Co – 2, L - 6)

11. a) Write the criteria for independence of three attributes. Find all the remaining class frequencies
for the following set of frequencies. N= 23713, (A) = 1618, (B) = 2015, (C) = 770, (AB) = 587,
(AC) = 335, (BC) = 428, (ABC) = 158 (Co – 3, L - 1)

(OR)

b) The male population of a particular state is 250lakhs. The number of literate males is 20 lakhs
and total number of male criminals is 26000. The number of literate male criminals is 2000. Do
you find any association between literacy ad criminality. (Co – 3, L - 1)

12. a) State the Karl Pearson's correlation coefficient and prove that it has between -1 and +1.
(Co – 4, L - 5)

(OR)

b) Obtain the rank correlation coefficient of marks of 12 students in statistics and computer science
given below (Co – 4, L - 5)

X	58	64	65	55	44	80	65	75	40	55	64	55
Y	52	48	45	62	45	68	62	82	44	45	74	62

13. a) Derive the regression equation of y on x (Co – 5, L - 3)

(OR)

b) Fit the power curve of the type $y = ax^b$ to the following data (Co – 5, L - 3)

X	3	5	8	10	12	13
Y	17	41	94	139	191	220

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SEMESTER–II **Credits – 3**

TELUGU-II

ఆధునిక తెలుగు సాహిత్యం

యూనిట్ల సంఖ్య: 5

కోర్స్ అవుట్ కమ్స్:

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ఆంగ్ల భాష ప్రభావం కారణంగా తెలుగులో వచ్చిన ఆధునిక సాహిత్యాన్ని, దాని విశిష్టతలను గుర్తిస్తారు.
2. సమకాలీన ఆధునిక సాహిత్య ప్రక్రియలైన "వచన కవిత్వం, కథ, నవల, నాటకం" విమర్శలపై అవగాహన పొందుతారు.
3. భావకవిత, అభ్యుదయ కవిత్వాల లక్ష్యాలను గూర్చిన జ్ఞానాన్ని పొందుతారు. ఇంకా అస్తిత్వవాదం, ఉద్యమాల పుట్టుకను, ఆవశ్యకతను గుర్తిస్తారు.
4. కథా సాహిత్యం ద్వారా సామాజిక చైతన్యాన్ని పొందుతారు. సిద్ధాంతాల ద్వారా కాకుండా, వాస్తవ పరిస్థితులను తెలుసుకోవడం ద్వారా సిద్ధాంతాన్ని సమీక్షించుకోగలరు.
5. ఆధునిక తెలుగు కల్పనా సాహిత్యం ద్వారా సామాజిక, సాంస్కృతిక, రాజకీయ చైతన్యాన్ని పొందుతారు.

లెర్నింగ్ ఆబ్జెక్టివ్స్:

1. ఆధునిక భాషా సాహిత్యము నందలి ప్రక్రియల పట్ల ప్రీతి, మమకారం, ఆసక్తి కల్గుతుంది.
2. ఆధునిక కవిత్వము పట్ల అవగాహన పద్ధతులు, ప్రసిద్ధులైన కవుల, రచయితల రచనా శైలి తెలుస్తాయి.
3. ఆధునిక సాహిత్య ప్రక్రియలైన కథ, నవల, నాటకం, విమర్శ మొదలగు సాహిత్య ప్రక్రియలలో రచనా మెలకువలు తెలుసుకోవటం జరుగుతుంది.
4. ఆధునిక సాహిత్యంలోని వివిధ కొత్త పదబంధాలు, శబ్ద ప్రయోగవైచిత్రి, భాషా పరిజ్ఞానాన్ని తెలుసుకుంటారు.
5. కాలానుగుణంగా సాహిత్యం తన స్వరూపాన్ని ఏవిధముగా మార్చుకుంటుందో విద్యార్థులు క్షుణ్ణంగా పరిశీలించే అవకాశం కల్గుతుంది.

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TELUGU-II

పాఠ్యప్రణాళిక

యూనిట్-I

1. ఆధునిక కవిత్వం - పరిచయం
2. కన్యక - గురజాడ వేంకట అప్పారావు
3. కొండవీడు - దువ్వూరి రామిరెడ్డి (కవి కోకిల గ్రంథావళి - ఖండ కావ్యాలు - నక్షత్రాల సంపుటి నుండి)
4. మాతృ సంగీతం - అనిసెట్టి సుబ్బారావు (అగ్ని వీణ కవితాసంపుటి నుండి)

యూనిట్-II

5. తెలుగు కథానిక - పరిచయం
6. భయం / కథ / - కాళీ పట్నం రామారావు
7. స్వేదం ఖరీదు ?/ కథ / - రెంటాల నాగేశ్వరరావు

యూనిట్-III

8. తెలుగు 'నవల' - పరిచయం
9. రథచక్రాలు / నవల / - మహీధర రామ్మోహనరావు (సంక్షిప్త ఇతివృత్తం మాత్రమే)
10. రథ చక్రాలు / సమీక్షా వ్యాసం / - డా. యల్లాప్రగడ మల్లికార్జునరావు

యూనిట్-IV

11. తెలుగు నాటకం - పరిచయం
12. యక్షగానము / నాటకము / నాటిక / - ఎం.వి.ఎస్. హరనాథరావు
13. అపురూప కళారూపల విధ్వంస దృశ్యం 'యక్షగానము'/ సమీక్షావ్యాసం - డా.కందిమళ్ళ సాంబశివరావు

యూనిట్-V

14. తెలుగు సాహిత్య విమర్శ - పరిచయం
15. విమర్శ - స్వరూప స్వభావాలు, ఉత్తమ విమర్శకుడు - లక్షణాలు.

ఆకార గ్రంథాలు / వ్యాసాలు:

1. ఆధునిక కవిత్వం - పరిచయం - ప్రొ.ఎస్వీ. సత్యనారాయణ
2. తెలుగు కథానిక - పరిచయం - ప్రొ. రాచపాళెం చంద్రశేఖర రెడ్డి
3. తెలుగు నవల - పరిచయం - వల్లంపాటి వెంకట సుబ్బయ్య
4. సాంఘిక నవల - కథన శిల్పం - ప్రొ. సి. మృణాళిని
5. తెలుగు నాటకం - పరిచయం - ప్రొ.ఎస్.గంగప్ప
6. తెలుగు సాహిత్య విమర్శ - పరిచయం - ప్రొ. జి.వి. సుబ్రహ్మణ్యం
7. నూరేళ్ల తెలుగు నాటక రంగం - ప్రొ. మొదలి నాగభూషణ శర్మ
8. నాటక శిల్పం - ప్రొ. మొదలి నాగభూషణ శర్మ

Contd...

TELUGU	TELT21A	2020-'21	B.A., B.Com., B.B.A., B.B.A.-Ana, B.Com.-CA, B.C.A., & B.Sc.,

ప్రశ్నపత్ర నిర్మాణ సూచిక: **TELUGU-II**

1. సంక్షిప్తరూప ప్రశ్నలు : 5 × 5 = 25మా

ప్రతి యూనిట్ నుండి తప్పనిసరిగా ఒక ప్రశ్న ఇచ్చి, మొత్తం మీద ఎనిమిది ప్రశ్నలు ఇవ్వాలి. అందులో ఐదింటికి సమాధానాలు వ్రాయమనాలి.

2. వ్యాసరూప ప్రశ్నలు : 5 × 10 = 50మా

ప్రతి యూనిట్ నుండి తప్పనిసరిగా ఒక ప్రశ్న ఇచ్చి, మొత్తం మీద ఎనిమిది ప్రశ్నలు ఇవ్వాలి. అందులో ఐదింటికి సమాధానాలు వ్రాయమనాలి.

మొత్తం = 75మా

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE :: VIJAYAWADA-520 010.

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SEMESTER-END EXAMINATIONS, APRIL-2021

నమూనా ప్రశ్నపత్రం

Course Code: TEL T21A (Telugu-II) **Max. Marks: 75M**

Time: 3 Hrs. **Pass Min. : 30M**

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SECTION - A

I. క్రింది వానిలో ఐదింటికి సంగ్రహ రూప సమాధానాలు వ్రాయండి: 5 × 5 = 25మా

1. 'కొండవీడు' - శ్రీ దువ్వూరి.
2. తెలుగు కథానికను పరిచయం చేయండి.
3. 'కన్యక' ఖండికను వివరించండి.
4. తెలుగు నాటక సాహిత్యాన్ని తెల్పండి.
5. ఉత్తమ విమర్శకుని లక్షణాలు.
6. ఆధునిక కవిత్వం - పరిచయం.
7. కాళీ పట్నం రామారావు.
8. అనిసెట్టి సుబ్బారావు.

SECTION - B

II. క్రింది వానిలో ఐదింటికి వ్యాసరూప సమాధానాలు వ్రాయండి: 5 × 10 = 50మా

9. శ్రీ దువ్వూరి 'కొండవీడు' ఖండికలో ఇచ్చిన సందేశాన్ని తెల్పండి.
10. 'భయం' కథలోని రచయిత అభిప్రాయాన్ని వివరించండి.
11. 'రథ చక్రాలు' నవల్లోని ఇతివృత్తాన్ని విశ్లేషించండి.
12. యక్షగానాన్ని సమీక్షించండి.
13. విమర్శ స్వరూప స్వభావాల్ని వివరించండి.
14. ఆధునిక కవిత్వ ఆవిర్భావ వికాసాన్ని తెల్పండి.
15. తెలుగు సాహిత్య విమర్శను వివరింపుము.
16. సాహిత్య ప్రక్రియగా 'నవల' స్థానాన్ని విమర్శించండి.

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P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

(An Autonomous College under the Jurisdiction of Krishna University)

Re – Accredited at 'A$^+$' by NAAC – III Cycle

College with Potential for Excellence (Awarded by the UGC)

ISO 9001 – 2015 Certified

Object Oriented Programming Using JAVA Lab

Offered To:	**B. Sc. (MPCS,CAMS,MSCS)-3 SEM B.SC(MECS, CAME)-4 SEM**	**Course Code:**	CSCP01
Course Type:	Core (Practical)	**Course:**	Object Oriented Programming using Java Lab
Year of Introduction:	2016 – 2017	**Year of offering:**	2021 – 2022
Year of Revision:	2021	**Percentage of Revision:**	15%
Semester:	III OR IV	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Knowledge in OOP & Java concepts, Programming Fundamentals

Course Objective:

To enable students to implement various OOP concepts using Java programming language and also educating students in accessing databases using JDBC connectivity.

Course Outcomes: At the end of this course, students should be able to:

CO1: Implementing class, constructor, method overloading, method overriding in java. (PO5, PO7)
CO2: Implement different types of inheritance and interfaces in a Java program .(PO5, PO7) CO3: Implement Multithreading, exception handling mechanisms in Java. (PO5, PO7) CO4: Implement Applets and JDBC connectivity. (PO5, PO7)

Java Lab list

1. Write a program to use command line arguments.
2. Write a program to demonstrate that include a method inside the Rectangular Class.
3. Write a program to demonstrate Parameterized Constructors.
4. Write a program to demonstrate Method Overloading.
5. Write a Program to demonstrate Constructor Overloading.
6. Write a program to demonstrate Method Inheritance.
7. Write a program to demonstrate Method Overriding.
8. Write a program to demonstrate Abstract Classes.
9. Write a program to arrange given Strings in Alphabetical Order.
10. Write a program for implementing interfaces.
11. Write a program on Multiple Inheritance.
12. Write a program to demonstrate the Creating threads using thread class.

13. Write a program to demonstrate using thread methods.
14. Write a program to Implement Thread Priority.
15. Write a program to demonstrate Catch Blocks.
16. Write a program to Import Packages.
17. Write a program to demonstrate Applet Program.
18. Write a program to create table and insert values into table in a database.
19. Write a program to delete values in a table in database.
20. Write a program to update values in a table in database.

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DATABASE MANAGEMENT SYSTEMS LAB

Offered to: B.Sc. (MPCS,MECS,CAME,MSCS,CAMS) **Course Code: CSCP33A**	
Course Type: Core (Practical)	**Course:** Database Management Systems Lab
Year of Introduction: 2017 – 2018	**Year of offering:** 2021
Year of Revision: 2021 **Semester**: III	**Percentage of Revision:** 10% **Credits: 1**
Hours Taught: 30 hrs. Per Semester **Max.Time**: 3 Hours	

Course Prerequisites (if any):
Knowledge in databases, SQL queries.

Course Description:
This course is designed to facilitate students to improve their practical skills in handling databases.

Course Objectives:
The main aim of this course is to enable students to experience database operations practically and develop logic in PL/SQL.

Course Outcomes: At the end of this course, students should be:
CO1: Able to implement basic relationships.(PO5, PO7)
CO2: Able to implement various SQL queries.(PO5, PO7)
CO3: Able to use no of constraints on data.(PO5, PO7)
CO4: Able to use different types of joins.(PO5, PO7)
CO5: Able to design PL/SQL programs(PO5, PO7)

LAB LIST

1. Order Tracking Database

The Order Tracking Database consists of the following defined six relation schemas. Employees(eno,ename,zip,hdate)
Parts(pno,pname,qoh,price,level) (hint: qoh: quality on hand)
Customers(cno,cname,street,zip,phone)
Orders(ono,cno,eno,received date,shipped date)
Odetails(ono,pno,qty)
Zipcodes(zip,city)

Solve the following queries

1. Get all pairs of customer numbers for customers based on same zip code. 2. Get part numbers for parts that have been ordered by at least two different customers. 3. For each odetail row, get ono, pno, pname,qty and price values along with the total price for the item. (total price=price*qty)
4. Get customer name and employee pairs such that the customer with name has placed an order through the employee
5. Get customer names living in Fort Dodge or liberal.
6. Get cname values of customers who have ordered a product with pno 10506. 7. Get pname values of parts with the lowest price.
8. Get cname values of customers who have placed at least one order through the employee with number 1000.
9. Get the cities in which customers or employees are located.
10. Get the total sales in dollars on all orders.
11. Get part name values that cost more than the average cost of all parts.
12. Get part names of parts ordered by at least two different Customers.
13. Get for each part get pno, pname and total sales
14. For each part, get pno, pname, total sales, whose total sales exceeds 1000
15. Get pno, part names of parts ordered by at least two different customers.
16. Get cname values of customers who have ordered parts from any one employee based in Wichita or liberal.

1. Shipment database

An enterprise wishes to maintain the details about his suppliers and other corresponding details. For that it uses the following tables

Table s(sid,sname,address)

primary key : sid

Table p(pid,pname,color)

primary key : pid

Table cat(sid,pid,cost)

primary key : sid+pid

reference key : sid references s.sid

pid references p.pid

Solve the following queries

1. Find the pnames of parts for which there is some supplier
2. Find the snames of suppliers who supply every part.
3. Find the snames of suppliers who suppy every red part.
4. Find the pnames of parts supllied by london supplier and by no one else
5. Find the sids of suppliers who charge more for some part other than the average cost of that part
6. Using group by with having clause get the part numbers for all the parts supplied by more than one supplier.
7. Get the names of the suppliers, who do not supply part p2.
8. Find the sids of suppliers who supply a red and a green part
9. Find the sids of suppliers who supply a red or a green part

10.find the total amount has to pay for that supplier by part located from London

3.Employee database

AN ENTERPRISE WISHES TO MAINTAIN A DATABASE TO AUTOMATE ITS OPERATIONS. ENTERPRISE DIVIDED INTO TO CERTAIN DEPARTMENTS AND EACH DEPARTMENT CONSISTS OF EMPLOYEES. THE FOLLOWING TWO TABLES DESCRIBES THE AUTOMATION SCHEMAS

Dept (deptno, dname, loc)

Emp (empno,ename,job,mgr,hiredate,sal,comm,deptno)

1. Create a view, which contain employee names and their manager names working in sales department.
2. Determine the names of employee, who earn more than their managers. 3. Determine the names of employees, who take highest salary in their departments. 4. Determine the employees, who located at the same place.
5. Determine the employees, whose total salary is like the minimum salary 6. of any department.
7. Update the employee salary by 25%, whose experience is greater than 10 years. 8. Delete the employees, who completed 32 years of service.
9. Determine the minimum salary of an employee and his details, who join on the same date.
10. Determine the count of employees, who are taking commission and not taking Commission.
11. Determine the department does not contain any employees.
12. Find out the details of top 5 earner of company.
13. Display those managers name whose salary is more than average salary of his employees.
14. Display those employees who joined the company before 15th of the month? 15. Display the manager who is having maximum number of employees working under him?
16. Print a list of employees displaying „less salary“ if less than 1500 if exactly 1500 display as „exact salary“ and if greater than 1500 display „more salary“?
17. Display those employees whose first 2 characters from hire date-last 2 characters of salary?
18. Display those employees whose 10% of salary is equal to the year of joining? 19. In which year did most people join the company? Display the year and number of employees.
20. Display the half of the enames in upper case and remaining lower case
21. Display ename, dname even if there no employees working in a particular department(use outer join).

4. Pl/sql programs

1. Write a pl/sql program to check the given number is strong or not.
2. Write a pl/sql program to check the given string is palindrome or not.

3. Write a pl/sql program to swap two numbers without using third variable.

4. Write a pl/sql program to generate multiplication tables for 2,4,6.

5. Write a pl/sql program to display sum of even numbers and sum of odd numbers in the given range.

6. Write a pl/sql program to check the given number is palindrome or not.

7. write a pl/sql procedure to prepare an electricity bill by using

following table table used: elect

name null? Type
mno not null number(3)
cname varchar2(20)
cur_read number(5)
prev_read number(5)
no_units number(5)
amount number(8,2)
ser_tax number(8,2)
net_amt number(9,2)

8. Write a procedure to update the salary of employee, who belongs to certain department with a certain percentage of raise.

9. Write a PL/SQL program to fire triggers on insert, update anddelete commands. @@@@

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Object Oriented Programming Using JAVA

Offered To:	**B. Sc. (MPCS,CAMS,MSCS)-3 SEM B.SC(MECS, CAME)-4 SEM**	**Course Code:**	CSCT01
Course Type:	Core (Theory)	**Course:**	Object Oriented Programming using Java
Year of Introduction:	2016 - 2017	**Year of offering:**	2021 – 2022
Year of Revision:	2021	**Percentage of Revision:**	15 %
Semester:	III OR IV	**Credits:**	4
Hours Taught:	60 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Programming Concepts.

Course Description: As the business environment becomes more sophisticated, the software development (software engineering is about managing complexity) is becoming increasingly complex. As of the best programming paradigm which helps to eliminate complexity of large projects, Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

Course Objectives:

1. Understand the features of Object Oriented Programming.

2. Understand features of Java programming language.

3. Know how to write and execute java programs in text editors.

4. Apply polymorphism, inheritance, multithreading, exception handling mechanism and packages in real life applications.

5. Write and read data from the files using streams, file handling methods and understand JDBC to perform database operations.

Course Outcomes: At the end of this course, students should be able to:

CO1: Understand the concept and underlying principles of Object-Oriented Programming, Understand how object-oriented concepts are incorporated into the Java programming language. (PO5, PO7).

CO2: Implement Object Oriented Programming Concepts (class, constructor, overloading, inheritance, overriding) in java. (PO5, PO7).

CO3: Analyse inheritance and interfaces in a Java program (PO5, PO7).

CO4: Evaluate Multithreading, exception handling in Java. (PO5, PO7).
CO5: Create applets and packages in a Java program, Use of Input/output Streams in java and use of JDBC with Oracle database. (PO5, PO7).

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Fundamentals Of Object – Oriented Programming:** Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features **Overview Of Java Language:** Introduction, Simple Java program structure, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments **Constants, Variables & Datatypes:** Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Symbolic Constants, Type casting, Getting Value of Variables, Standard Default values **Operators & Expressions**	10
II	**Decision Making & Branching:** Introduction, Decision making with if statement, Simple if statement, If - Else statement, Nesting of if- else statements, The else if ladder, The switch statement, The conditional operator. **Looping:** Introduction, The While statement, The do-while statement, The for statement,Jumps in loops. **Classes, Objects & Methods:** Introduction, Defining a class, Adding variables, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members, Nesting of methods.	12
III	**Inheritance:** Extending a class, Overloading methods, Final variables and methods, Final classes, Abstract methods and classes. **Arrays, Strings:** Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Wrapper classes. **Interfaces:** MULTIPLE INHERITANCE: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables.	12
IV	**Multithreaded Programming:** Introduction, Creating Threads, Extending the Threads, Stopping and Blocking a Thread, Lifecycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the 'Runnable' Interface. **Managing Errors And Exceptions:** Types of errors, Compile-time errors, Run-time errors, Exceptions, Exception handling, Multiple Catch Statements, Using finally statement. **Packages:** Introduction, Java API Packages, Creating Packages, Accessing a Package, Using a Package.	13

V	**Applet Programming:** Local and remote applets, Applets and Applications, Building Applet code, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state. **Managing Input/Output Files In Java:** Introduction, Concept of Streams, Stream classes, Byte Stream Classes, Character Stream classes: Reader stream classes, Writer Stream classes, Reading and writing files. **Java Database Connectivity:** JDBC introduction, Stages in JDBC Program, Working with Oracle Database: Inserting, Deleting and Updating records.	13

Text Books:

1. Programming with Java, E – Balagurusamy, 3e, TMH.
2. Core Java: An Integrated Approach, Dr. R. Nageswara Rao & KogentLearning Solutions Inc.

Reference Books:

1. Programming with Java, 2ed, John R. Hubbard, Schaum's outline Series, TMH
2. Deitel & Deitel, Java TM : How to program, PHI(2007)

Course Delivery method : Face-to-face / Blended

Course has focus on : Employability

Websites of Interest :

[1].https://www.javatpoint.com/java-tutorial

[2].https://www.w3schools.com/java/

[3].https://www.tutorialspoint.com/jdbc/index.htm

Co-curricular Activities : Programming Contests, Assignments & Quiz.

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OBJECT ORIENTED PROGRAMMING USING JAVA

MODEL PAPER

CLASS: **B. Sc. (MPCS,CAMS,MSCS)-3 SEM AND B.SC(MECS, CAME)-4 SEM**

Max. Marks: 75M

Course Code: CSCT01 **Min. Pass: 30M**

Semester: III OR IV **Time: 3 Hours**

Section-A

ANSWER ANY FIVE QUESTIONS 5x5M=25M

1. Explain structure of java program.(CO1, L2)
2. Define a class and add methods, variables to it and create objects for it. (CO2,L1)
3. Explain constructors in java with example. (CO2,L2)
4. Explain any five string handling methods in java.(CO3, L2)
5. Illustrate implementing interfaces in java with example. (CO3,L2)
6. Illustrate creating threads in java with example .(CO4,L2)
7. Illustrate Arithmetic Exception in java with example.(CO4, L2)
8. Explain byte stream classes in java. (CO5, L2)

Section-B

ANSWER THE FOLLOWING QUESTIONS 5x10M=50M

9. (A) Explain Object Oriented Programming Principles. (CO_1,L2)

(OR)

(B) Explain Java Buzz words. (CO1, L2)

10. (A) Explain the following with programs (CO2, L2)

i. Method Overloading 5M

ii. Abstract classes 5M

(OR**)**

(B) Explain the concept of static members in java with an example. (CO2 ,L2)

11. (A) Explain the concept of final keyword with an example. (CO3,L2)

(OR)

(B) List of different types of inheritance in java with examples. (CO3,L4)

12. (A) Explain life cycle of a thread with neat diagram. (CO4,L2)

(OR**)**

(B) Define Exception. Explain Exception handling mechanism in java with examples

(CO4, L1,L2)

13. (A) Explain creating and accessing package in java with example. (CO5,L2)

(OR)

(B) Explain different stages in JDBC program with an example..(CO5,L6)

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DATABASE MANAGEMENT SYSTEMS

Offered to: B.Sc. (Computer Science ALL SECTIONS) /BCA Course Code: CSCT34B / CSCT37	
Course Type: Core (Theory)	**Course:** Database Management Systems
Year of Introduction: 2017 – 2018	**Year of offering:** 2021
Year of Revision: 2021	**Percentage of Revision:** 10%
Semester: III **Credits: 4**	
Hours Taught: 60 hrs. Per Semester	**Max.Time**: 3 Hours

Course Prerequisites (if any): Basic knowledge in computers andprogramming.

Course Description:

This course focuses towards Database System Concepts and Architecture, ER models, relational algebra relational calculus, SQL and PL/SQL.

Course Objectives:
1. To understand data, database, DBMS and its components and architecture.
2. To understand building blocks of ER model and EER model and their properties.
3. To understand CODD Rules, relational model, relational calculus, relational algebra and normalization.
4. To understand SQL commands and implement the queries on tables.
5. To understand PL/SQL operations.

Course Outcomes: At the end of this course, students should be able to:

CO1: Gain the Knowledge on Database, DBMS and analyse the difference between file-based system and DBMS. (PO5, PO7)
CO2: Model Database using ER and EER diagrams and design database schemas based on that model. (PO5, PO7)
CO3: Understanding the fundamental concepts of DBMS with Special emphasis on Relational Model, understanding Normalization and applying it to normalization of database. (PO5, PO7)
CO4: Create a small database using SQL COMMANDS, store and Retrieve data from the database. (PO5, PO7).
CO5: Understanding PL/SQL and various operations in PL/SQL (PO5, PO7).

Syllabus

Unit	Learning Units	Lecture Hours
I	**Overview of Database Management Systems:** Introduction to Data, information, data vs. information –database and DBMS Role and advantages of DBMS – types of databases –problems with file system data management - -Database systems-components of Database system- DBMS functions **Data Models:** The importance of Data models – Data model basic building blocks – Business Rules- The evolution of Data Models-Degrees of data abstraction	12
II	**Entity-Relationship Modeling:** The Entity Relationship Model – entities – attributes –relationships – connectivity and cardinality –relationship degree - Developing an ER diagram – **The Extended Entity Relationship Model** Entity Super types and Subtypes- Specialization and Generalization -entity integrity - selecting primary keys - Natural Keys and Primary Keys - Primary Key Guidelines - When to Use Composite Primary Keys -	12
III	**The Relational Database Model:** A logical view of data- Tables and their characteristics – keys – Integrity rules – Relational Set operators – Codd‟s Relational database rules **Normalization of database tables:** The need for normalization – The normalization process – converting to first normal form – conversion to second normal form – conversion to third normal form – higher level normal forms -	12
IV	**Structured Query Language:** Introduction to Sql-Data Definition Commands – Data Types - Creating Table Structures - SQL Constraints - advanced data definition commands - alter – drop **Data Manipulation Language:** Adding Table Rows Saving Table Changes - Updating Table Rows - Restoring Table Contents - Deleting Table Rows **Select Queries:** Selecting Rows with Conditional Restrictions – operators - advanced select queries – virtual tables – joining database tables – sub queries – SQL functions	12
V	**PL/SQL:** Introduction- -Structure of PL/SQL-PL/SQL Language Elements-Data Types Control Structures- Iterative Control- Procedures – Functions - Database Triggers**:** Types of Triggers	12

PrescribedTextBooks			
	Author	**Title**	**Publisher**
1	Carlos Coronel, Steven Morris,Peter Rob	Database Principles fundamentals of design, implementation and management	Cengage Learning

2	Steven Feuerstein	Oracle PL./SQL programming	OREILLY

ReferenceTextBook			
	Author	**Title**	**Publisher**
1	Raghu Ramakrishnan	Database Management Systems	McGrawhill
2	J. D. Ullman	Principles of Database Systems	Pearson prentice hall
3	Abraham Silberschatz, Henry Korth, and S. Sudarshan	Database System Concepts	McGraw hill
4	R. Elmasri and S. Navathe	Fundamentals of Database Systems	Pearson

Course Delivery method: Face-to-face / Blended

Course has focus on: Skill Development, Employability

Websites of Interest:

www.tutorialspoint.com/plsql
www.javatpoint.com/pl-sql-tutorial

Co-curricular Activities: Programming Contests, Hackathons & Quiz.

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DATABASE MANAGEMENT SYSTEMS

MODEL QUESTION PAPER FOR SEM END

EXAMINATION CLASS: B.Sc.(Computer Science)/ BCA

Course Code: CSCT34B / CSCT37 **Max. Marks: 75M**

Semester: III **Time: 3 Hours**

SECTION - A

ANSWER ANY FIVE QUESTIONS 5x5M=25M

1. What are the differences between data and information.(CO1, L1)
2. Write a short note on evolution of data models.(CO1, L1)
3. Explain different types of attributes with neat diagrams. (CO2, L2)
4. Explain CODD Rules(CO3, L2)
5. Explain different types of Aggregate functions in SQL. (CO4, L2)
6. Write a short note on string functions in SQL (CO4, L1)
7. Explain Structure of PL/SQL(CO5, L2)
8. Explain Functions in PL/SQL.(CO5, L2)

Section-B

ANSWER THE FOLLOWING QUESTIONS 5x10M=50M

9. a. Explain the role and advantages of DBMS? (CO1, L1)

OR

b. Explain briefly about degrees of data abstraction. (CO1, L1)

10. a. Explain Specialization hierarchy with an example.(CO2, L2)

OR

b. Explain Entity Relationship diagram with an example (CO2, L2)

11. a. Write a short note on relational set operators (CO3, L1)

OR

b. What is normalization? Explain with an example upto 3NF. (CO3, L2)

12. a. Explain DDL, DML, DCL commands in SQL with examples. (CO4, L2)

OR

b. Explain views in SQL with syntax and examples.(CO4, L2)

13 a. Discuss about iterative control statements available in PL/SQL with syntax and examples.(CO5, L2)

OR

b. Explain types of Triggers.(CO5, L2)

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PARVATHANENIBRAHMAIAH SIDDHARTHA COLLEGE OF ARTS AND SCIENCE; VIJAYAWADA-10

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SEMESTER- III/IV **PAPER – III/IV**

TITLE OF THE PAPER: HINDI-III/IV

NO OF HOURS: 60 **CREDITS: 03**

WEF: 2021-22 **COURSE CODE: HINT01A**

Cos:

1.दोहों के व्दारा विद्यार्थियोंमें समाज सुधार की भावना, मानव मूल्यों का विकास हो सकेगा।

2. हिंदी साहित्य के इतिहास के व्दारा हिन्दी भाषा और साहित्य की प्रमुखता से परिचित हो सकेंगे।

3. समाज कल्याण के विषयों को समझकर विद्यार्थिअपने ज्ञान का विकास कर सकेंगे।

4. समाज में हिन्दी भाषा के परिचित हो सकेंगे और हिन्दी भाषा का ज्ञानप्राप्तकर दूसरों से आसानी से संप्रेषित करने में सक्षम हो सकेंगे।

5.प्रयोजनमूलक हिन्दी प्राप्तकर सकेंगे और हिन्दी में पत्राचार का कौशल विकसित कर सकेंगे।

PARVATHANENIBRAHMAIAH SIDDHARTHA COLLEGE OF ARTS AND SCIENCE; VIJAYAWADA-10

(An autonomous college in the jurisdiction of Krishna University)

SEMESTER- III/IV **PAPER – III/IV**

TITLE OF THE PAPER: HINDI-III/IV

NO OF HOURS: 60 **CREDITS: 03**

WEF: 2021-22 **COURSE CODE: HINT01A**

SYLLABUS

I.**काव्य दीप**:

साखी- 1-10 - कबीरदास

बालवर्णन - सूरदास

मातृभूमि - मैथिलीशरण गुप्त

तोडती पत्थर - सूर्यकांत त्रिपाठी निराला

गीत फरोश - भवानी प्रसाद मिश्र

II.**हिन्दी साहित्य का इतिहास**:

काल विभाजन - आचार्य रामचन्द्र शुक्ल के अनुसार

भक्ति काल : ज्ञानाश्रयी शाखा - कबीर

प्रेमाश्रयी शाखा - जायसी

III.**साधारण निबन्ध**:समाचार पत्र, पर्यावरण और प्रदूषण,

बेकारी की समस्या, कंप्यूटर

IV. **अनुवाद** :(हिन्दी से अंग्रेजी में बदलना तथा अंग्रेजी से हिन्दी में बदलना)

V.**प्रयोजनमूलकहिन्दी**: परिपत्र,कार्यालय ज्ञापन,राष्ट्र-भाषा हिन्दी

Recommended Books:

1.काव्य दीप- **SRI B.RADHA KRISHNA MURTHY**

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(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)
III SEMESTER Model Question Paper, November-2022 (Hindi-III)

Course Code: HINT01A **Max. Marks: 75M**
Time: 3 Hrs. **Pass Min. : 30M**

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PART-A

I. निम्नलिखित प्रश्नों में से किन्हीं पाँच प्रश्नों का उत्तर दीजिए: **5×5=25M**

1. व्याख्या कीजिए। L2

पाहन पूजे हरि मिलै, तो मैं पूजूँ पहाड़।

ताते ये चाकी भली , पीस खाय संसार ।।

2.किसी एक कवि का साहित्यक परिचय दीजिए। L1

(i)कबीर (ii) सूर्यकांतत्रिपाठी‘निराला’

3.मातृभूमिकविता की विशेषताएँ लिखिए। L1

4.व्याख्या कीजिए । L2

जी गीत जनम का लिखूँ, मरन का लिखूँ,

जी गीत जीत का लिखूँ, शरण कर लिखूँ।

5.ज्ञानमार्ग शाखा की विशेषताएँ बताइए। L2

6.प्रदूषण के निवारणोपाय लिखिए। L1

7.परिपत्र की परिभाषा दीजिए। L1

8.अनुवाद किसे कहते हैं? L2

PART-B

II. निम्नलिखित प्रश्नोंका उत्तर दीजिए: **5×10=50M**

9. किसी एक कविता का सारांश विशेषताओं के सहित लिखिए। L2

(i)गीत फरोश (ii) तोड़ती पत्थर

10. (अ) हिन्दी साहित्य का इतिहास - काल विभाजन के बारे में लिखिए। L2

अथवा

(आ) प्रेमाश्रय शाखा की विशेषताओं का परिचय दीजिए।

11.किसी एक निबंध पर प्रकाश डालिए। L2

(i) बेकारी की समस्या (ii) पर्यावरण और प्रदूषण (iii) कंप्यूटर

12. (अ) हिन्दी में अनुवाद कीजिए। L2

(i) India is our country

(ii) We should respect our parents

(iii)How many students are there in the class room?

(iv)Where are you going now?

(v)This is our college.

अथवा

(आ)अंग्रेजी में अनुवाद कीजिए।

(i)हम कॉलेज जाते हैं।

(ii)हिन्दी हमारी राष्ट्रभाषा है।

(iii)रमा नाचती है।

(iv)मानव सेवा ही माधव सेवा है।

(v)कल रविवार था।

13.किसी एक पर टिप्पणी लिखिए। L1

(i)परिपत्र (ii)कार्यालय ज्ञापन (iii)राष्ट्र-भाषा हिन्दी

PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE, VIJAYAWADA

Course Code: **MAT T01A**

Offered to: B.A(EMS), B.Sc. B.Sc(MPC, MPCS, MECS, CAME, MSCA, MSCS)

Domain Subject: **MATHEMATICS** Semester –III/IV

Max. Marks: **100** (IA: 25+ SEE: 75) Theory Hrs./Week: **6**

Course Title: SOLID GEOMETRY
Type of the Course: **Skill Enhancement Course** (Elective) Credits: **5**

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Understand the basic concepts of plane to find the length of perpendicular from a given point to given plane, bisectors of angles between two planes, angle between the pair of planes.

CO2: Determine the equation of a line in various forms & image of a given point w.r.t. a line and plane.

CO3: Compute the equations of the hallow spheres through the given points, plane section of a sphere.

CO4: Determine orthogonal spheres, coaxial system of spheres. The equation of cone, vertex of a cone, General equation of second degree should represent acone.

CO5: Calculate the equation of enveloping cone, reciprocal cone, right circular cone, intersection of two cones with a common vertex.

II. Syllabus: **(Total Theory Hours: 90)**

UNIT-I: The Plane **(18Hrs)**

1.1 Equation of plane in terms of its interception the axis, Equations of the plane through the given points
1.2 Length of the perpendicular from a given point to a given plane, Bisectors of angles between two planes
1.3 Plane passing through the intersection of two given planes, Orthogonal projection on a plane
1.4 Joint equation of a pair of planes, Angle between the pair of planes, Angle between the pair of parallel planes.

UNIT-II: The Line **(18Hrs)**

2.1 Equation of a line in symmetric form and parametric form; Angle between a line and a plane
2.2 The condition that a given line may lie in a given plane, The condition that two given lines are coplanar
2.3 Number of arbitrary constants or parameters in the equations of straight line
2.4 Length of the perpendicular from a given point to a given line.
2.5 The shortest distance between two lines, The length and equations of the line of shortest distance between two straight lines.

UNIT-III: Sphere: **(18Hrs)**

3.1 Definition and equation of the sphere; Equation of the sphere through given points
3.2 Plane sections of a sphere, Great Circle, Small Circle
3.3 Intersection of sphere and a line.
3.4 Conditions for a plane to intersect a sphere
3.5 Equation of a Sphere through a given circle
3.6 Intersection of a sphere and a line; tangent plane touching spheres, Power of a point;
3.7 Plane of contact; Polar plane; Pole of a Plane; Conjugate points; Conjugate planes; Conjugate lines or polar lines, Angle of intersection of two spheres; Conditions for two Spheres to be orthogonal;
3.8 Radical plane; Radical line, Radical Centre, Coaxial system of spheres; Limiting points.

UNIT-IV: Cones **(18Hrs)**

4.1 Definition of a cone, Vertex, guiding curve, generators, Equation of the cone with a given Vertex and guiding curve
4.2 Condition that the general equation of the second degree should represent a cone
4.3 Enveloping cone of a surface, Equations of cones with vertex at origin

4.4 Condition that a cone may have three mutually perpendicular generators, Intersection of a line with a cone
4.5 Tangent lines and tangent plane at a point, Condition that a plane may touch a cone
4.6 Reciprocal cones, Intersection of two cones with a common vertex
4.7 Right circular cone, Equation of the right circular cone with a given vertex, Axis and semi-vertical angle.

UNIT-V: Cylinders: (18Hrs)

5.1 Definition of a cylinder, Equation to the cylinder whose generators intersect a given Conic and are parallel to a given line
5.2 Enveloping cylinder of a sphere
5.3 The right circular cylinder
5.4 Condition for tangents, Director Sphere.

III REFERENCES:

1. Analytical Solid Geometry by Shanti Narayan and P.K. Mittal, published by S. Chand & Company Ltd.7th Edition.
2. A text book of Mathematics for BA/ B.Sc. Vol-1, by V. Krishna Murthy & others published by S. Chand & Company, New Delhi.
3. A text book of Analytical Geometry of Three Dimensions by P.K. Jain and Khaleel Ahmed, published by Wiley Eastern Ltd. 1999.
4. Co-ordinate Geometry of two and three dimensions by P. Balasubrahmanyam, K.Y. Subrahmanyam, G.R. Venkataraman published by Tata-MC Gran-Hill publishers Company Ltd. New Delhi.
5. Solid Geometry by B. Rama Bhupal Reddy, published by Spectrum University Press.

IV.Student Activities:

1) **Class-room activities:** Power point presentations, Assignments
2) **Library activities:** Visit to library and preparation of notes for Assignment problems.
3) **Activities in the Seminars, workshops and conferences:** Participation/presentation in seminar/workshop/conference.

CO-CURRICULAR ACTIVITES:

- Quiz Competitions, Seminars
- Group Discussions

WEB LINKS:

https://www.whitman.edu/mathematics/calculus_online/section12.05.html
https://en.wikipedia.org/wiki/Sphere

PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE, VIJAYAWADA

Course Code: **MAT T01A**

Offered to: B.A (EMS), B.Sc. (MPCS, MECS, CAME, CAMS**)**

Title of the Course: SOLID GEOMETRY **MAX MARKS: 75** **Time: 3hrs.**

Section – A

Answer any FIVE questions **(5x5=25 Marks)**

1. Find the equation of the plane through (4, 4, 0) and perpendicular to the planes x+2y+2z and 3x+3y+2z-8=0. (CO1, L2)

2. Find the angle between the planes 2x-3y-6z =6 and 6x+3y-2z=18. (CO1, L2)

3. Find the image of the point (2,-1,3) in the plane 3x-2y+z=9 (CO2, L3)

4. Find the equation to the sphere through O=(0,0,0) and making intercepts a, b, c on theaxes. (CO3, L3)

5. Find the equations of the spheres passing through the circle$x^2 + y^2 = 4$, z=0 and is intersected by the plane x+2y+2z=0 in a circle of radius 3. (CO3, L3)

6. Find the equation of the cone whose vertex is (1, 1, 0) and whose guiding curve is y=0, $x^2 + z^2 = 4$ (CO4, L3)

7. Find the equation to the cone which passes through the three coordinate axes and the lines $\frac{x}{1} = \frac{y}{-2} = \frac{z}{3}and\frac{x}{2} = \frac{y}{1} = \frac{z}{1}$ (CO4, L3)

8. Find the equation of the cylinder whose generators are parallel to $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and which Passes through the curve $x^2 + y^2$=16, z=0 (CO5, L3)

Section – B

Answer ALL questions. **(5 x 10 = 50 Marks)**

9(a). Prove that the equation $2x^2 - 6y^2 - 12z^2 + 18yz + 2zx + xy = 0$ represents a pair of planes, and find the angle between them. (CO1, L2)

(OR)

9(b). Find the bisecting plane of the acute angle between the planes 3x-2y+6z+2 =0, 2x-y+2z+2=0 (CO1, L2)

10(a). Find the image of the line $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ in the plane x+y+z=1 (CO2, L3)

(OR)

10(b). Find the length and equations to the line of S.D between the lines
$\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-1}{2}, \frac{x-4}{4}=\frac{y-3}{5}=\frac{z-2}{3}$ (CO2, L3)

11(a). Show that the plane 2x-2y+z+12=0 touches the sphere $x^2+y^2+z^2-2x-4y+2z-3=0$ and find the point of contact. (CO3, L3)

(OR)

11(b). Find the limiting points of the co-axial system of spheres of which two members are
$x^2+y^2+z^2+3x-3y+6=0$, $x^2+y^2+z^2-6y-6z+6=0$ (CO3, L3)

12(a). Find the vertex of the cone
$7x^2+2y^2+2z^2-10zx+10xy+26x-2y+2z-17=0$ (CO4, L3)

(OR)

12(b). Find the equation to the right circular cone whose vertex is (1,-2,-1), axes the line $\frac{x-1}{3}=\frac{y+2}{4}=\frac{z+1}{5}$ and semi vertical angle 60° (CO4, L3)

13(a). Find the equation to the right circular cylinder whose guiding circle is
$x^2+y^2+z^2=9$, x-y+z=3 (CO5, L3)

(OR)

13(b). Find the equation of the enveloping cylinder of the sphere $x^2+y^2+z^2-2x+4y-1=0$, having its generators parallel to the line x=y=z. (CO5, L3)

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Department of Mathematics

COURSE STRUCTURE

Sem	Course Code	Paper	Title of the Paper	Total Marks	Internal Exam	Sem.End Exam	Teaching Hours	Credits
II	MATT31	CORE	ABSTRACT ALGEBRA	100	25	75	6	5

Programme Outcomes

S. No	P.O
	At the end of the Programme the student will be able to:
1	Demonstrate the ability to use mathematical skills such as formulating and tackling mathematics related problems and identifying and applying approximate physical principles and methodologies to solve a wide range of problems associated with mathematics.
2	Apply the underlying unifying structures of mathematics and the relationships among them.
3	Investigate and apply mathematical problems and solutions in variety of contexts related to science and technology, business and industry.

Course Outcomes of MATT

S. No	C.O Upon successful completion of this course, students should have the knowledge and skills to:	Mapping
1	Understand concepts of groups and its properties.	L2, PO –1
2	Determine subgroups and whether the given subsets of a group are subgroups.	L4, PO - 1
3	Explain the significance of cosets, normal subgroups and factor groups.	L2,PO - 2
4	Determine group homomorphisms and isomorphisms.	L4, PO – 1
5	Find cycles of a given permutations and understand the properties of cyclic groups.	L1, PO – 2

CO-PO MATRIX							
CO-PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
CO1					**H**		
CO2					**H**		
CO3						**M**	
CO4							**M**
CO5							**M**

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS &SCIENCE

VIJAYAWADA-10.

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

MATHEMATICS	MAT T	2019 – 20 onwards	B.Sc(MSDS)

ABSTRACT ALGEBRA

SEMESTER-II **No of Credits: 5**

OBJECTIVES: 1. This course aims to provide a first approach to the subject of algebra, which is one of the basic pillars of modern mathematics.
2. The focus of the course will be the study of certain structures called groups, Sub groups, cyclic groups, permutation groups etc..
3. Abstract algebra gives to student a good mathematical maturity and enables to build Mathematical thinking and skill.

UNIT-I : GROUPS **(16 hrs)**

1.1 Binary Operation, Semi group, Algebraic Structure, Monoid, Cancellation laws, Group definition, Abelian group, Elementary Properties

1.2 Finite and Infinite groups with examples, Order of a group with examples

1.3 Addition modulo m – Definition – theorem – Problems

1.4 Multiplication Modulo P – definition- {1, 2, 3,…….p-1} where P is a prime number is a group – theorem – Problems

1.5 Order of an element of a group – Definition – Theorems.

UNIT-II: SUB GROUPS **(20 hrs)**

2.1 Complex definition, Multiplication of two complexes, Inverse of a complex, subgroup definition, Identity and Inverse of a subgroup

2.2 Criterion for a complex to be a subgroup, Criterion for the product of two subgroups to be a subgroup

2.3 Union and Intersection of subgroups.

2.4 Cosets Definition – Properties of cosets.

2.5 Index of a subgroups of a finite groups, Lagrange's Theorem.

UNIT-III: NORMAL SUBGROUPS (18 hrs)

3.1 Definition of a normal subgroup, Proper and improper normal subgroups

3.2 Intersection of two normal subgroups, Subgroup of index 2 is a normal subgroup, Simple group

3.3 Quotient group, Criteria for the existence of a Quotient group

UNIT-IV: HOMOMORPHISM (16 hrs)

4.1 Definition of a Homomorphism, Image of a Homomorphism, Properties of a Homomorphism

4.2 Isomorphism, Automorphism definitions and elementary properties

4.3 Kernel of a homomorphism, Fundamental theorem on homomorphism of groups and Applications

4.4 Inner automorphism, Outer automorphism.

(P.T.O)

UNIT-V: PERMUTATIONS AND CYCLIC GROUPS (20 hrs)

5.1 Definition of a permutation group, Equal permutations, Permutation multiplications, Order of a permutation, Inverse of a permutation, Orbits and cycles of permutation

5.2 Transposition, Even and odd permutations – Theorem – Related Problems.

5.3 Cayley's theorem – Related Problems.

5.4 Definition of a cyclic group – Properties of Cyclic group

5.5 Standard theorems on cyclic groups – related problems.

Prescribed Text book:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1	V.Venkateswara Rao, BVSS Sharma, S.AnjaneyaSastry & Others	A textbook of mathematics for B.A/B.ScVol – I	S-Chand	2015

Reference books:

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1	Dr.A. Anjaneyulu	A text book of mathematics for B.A/B.ScVol – I	Deepthi Publications	2015

2	M.L.Khanna	Modern Algebra	Jaya Prakashnadh & Co	2012

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS &SCIENCE :: VIJAYAWADA-10.
(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

SEMESTER – II
Model Paper

COURSE CODE: MATT

TITLE OF THE PAPER: ABSTRACT ALGEBRA

Time: 3hrs. **Max. Marks: 75**

Section – A

Answer any FIVE questions **5x5=25**

1. In a group G, Show that the inverse of an element is unique. (L1,CO1)
2. H is a non-empty complex of a group G. Show that the necessary and sufficient condition for H to be a sub group of G is $a,b\in H\Rightarrow ab^{-1}\in H$. (L1,CO2)
3. Show that any two left (right) cosets of a sub group are either disjoint (or) identical.(L2,CO3)
4. Show that every subgroup of an abelian group is normal. (L3,CO3)
5. Prove that Every Quotient group of an abelian group is abelian. (L2,CO3)
6. If 'f' is a homomorphism of a group G into a group G', then show that the Kernel of f is a normal subgroup of G. (L3,CO3)
7. Use Cayley's theorem to find the regular permutation group isomorphic to the multiplicative group $\{1,-1,i,-i\}$. (L3,CO5)
8. Prove that every cyclic group is abelian. (L2,CO5)

Section – B

Answer ALL questions. **(5 x 10 = 50)**

Unit - I

9. Prove that the set Z of all integers from an abelian group w.r.t to the operation defined by a * b = a+b+2 $\forall$ a,b$\in$z. (L3, CO1)

(OR)

10. Prove that G = {0,1,2,3,4,5} is an abelian group w.r.t. addition modulo 6.(L3,CO1)

Unit – II

11. Prove that the union of two sub groups of a group G is a sub group of G if and only if one is contained in the other. (L1,CO2)

(OR)

12. State and prove Lagrange's theorem on groups. (L1,CO2)

Unit – III

13. If H is a normal subgroup of a group G, then prove that the set of all cosets of H in G is a group with respect to coset multiplication. (L1,CO3)

(OR)

14. Prove that H is a normal subgroup of a group G iff product of two right cosets of H is again a right coset of H. (L1,CO3)

(P.T.O)

Unit – IV

15. State and Prove Fundamental Theorem of Homomorphism. (L1,CO4)

(OR)

16. Let 'a' be a fixed element of a group G. Prove that the mapping $f_a : G \to G$ defined by $f_a(x) = a^{-1}xa \forall x \in G$ is an automorphism of G. (L2,CO4)

Unit - V

17. Prove that every finite group G is isomorphic to a permutation group. (L1,CO5)

(OR)

18. Prove that every subgroup of a cyclic group is cyclic. (L1,CO5)

P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous -ISO 9001 – 2015 Certified

Statistical Inference

Offered to: BA(EMS) & B.SC (MSCs, MSCA & MSDS) / STAP31C

Course Type: Core (Practical)

Year of Introduction: 2021 **Year of Revision: 2022** **Percentage of Revision: 50%**

Semester: III **Paper No. III** **Credits: 1**

Hours Taught: 30 periods. per Semester **Max.Time: 2** Hours

Course Prerequisites (if any): Student required basic knowledge in computers

Course Description:

This course gives a working knowledge of Excel to students with the aim of getting to use data analysis and testing.

Course Objectives

1) To train students in SPSS Software
2) To expose the students to the analysis of statistical data and comparing data sets.

Learning Outcomes: At the end of the course, the student will

1) able to do data analysis using Excel
2) known to choose the data to test various types.

S. No	Programme Outcomes
PO1.	**Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology
PO2.	**Effective Citizenship**: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO3.	**Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO4.	**Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development
PO5.	**Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO6:	**Specialized Skills / Transferable Skills:** Acquisition of communication and soft, analytical and technological skills that aid in enhancing
PO7.	**Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Programme Outcomes Mapping**
CO 1	To Apply statistical analysis that can test hypotheses under parametric approaches.	PO –6
CO 2	To Apply statistical analysis that can test hypotheses under non-parametric approaches.	PO –6

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
	CO1					**H**		
	CO2					**H**		
	CO3						**H**	
	CO4						**H**	
STAP31C	**CO5**						**M**	

List of practical's

1. Small sample test (t-test): One Sample, Independent Sample and Paired Sample.
2. Large sample tests: One Sample, Independent Sample, Paired Sample (Using Excel)
3. Small sample test (F-test): Equality of population variances (Using Excel)
4. Chi square Test: Test of Independence
5. Chi square Test: Goodness of fit
6. Chi square Test: Test of Independence, 2X2, 3X3,…, mXn Cross tabulation (Using Excel)
7. Non Parametric Tests: Mann Whitney U test and Wilcoxon Signed ranks test
8. Non Parametric Tests: Kruskal Wallis Test and Friedman test (Using Excel)

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P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous -ISO 9001 – 2015 Certified

Statistical Inference

Offered to: BA(EMS) & B.SC (MSCs, MSCA & MSDS) / STAT31C

Course Type: Core (Theory)

Year of Introduction: 2021 **Year of Revision: 2022** **Percentage of Revision: 50%**

Semester: III **Paper No. : III** **Credits: 4**

Hours Taught: 60 periods. per Semester **Max. Time: 3** Hours

Course Prerequisites (if any): Student required basic knowledge in Probability and Distribution Theory

Course Description:

This course helps the students to familiarize with the ways in which we talk about uncertainty and estimate their situations in which probability arises. Also this course aims at providing basic knowledge about theoretical and application to test according to situations.

Course Objectives:

1) To describe many of the important estimation methods and characteristics of the estimators.
2) To understand the problem of statistical inference with specific reference to point estimation and interval estimation.
3) To differentiate between large and small samples and apply apt testing procedures.

Learning Outcomes: At the end of the course, the student will

1) Students will understood the distinguish between the parametric and Non Parametric situations.
3) The parameters describe an underlying physical setting in such a way that their value affects the distribution of the measured data..

S. No	Program Outcomes
PO1.	**Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology
PO2.	**Effective Citizenship**: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO3.	**Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO4.	**Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development
PO5.	**Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO6:	**Specialized Skills / Transferable Skills:** Acquisition of communication and soft, analytical and technological skills that aid in enhancing

PO7.	**Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Program Outcomes Mapping**
CO 1	Obtain the knowledge on Exact sampling distributions and their application towards real world examples	PO - 5
CO 2	knowledge of point and interval estimation procedures and different methods of point estimation	PO - 6
CO3	Obtain the knowledge on various testing hypothetical statements and finding Uniformly Most Powerful Test	PO - 6
CO 4	a fundamental understanding of Parametric models for developing relevant inferences on associated parameters large and small samples.	PO - 6
CO 5	To obtain the knowledge and to know the applications of various Non-Randomized tests	PO - 6

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
STAT31C	**CO1**					**H**		
	CO2						**M**	
	CO3						**M**	
	CO4						**H**	
	CO5						**H**	

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Exact Sampling Distributions** Concepts of Population, Sample, Parameter, Statistic, Sampling distribution, Standard error. law of large numbers, central limit theorem (statements only). Student's t- distribution, F – Distribution, $\chi 2$ - Distribution: Definitions, properties and their applications.	**9**
II	**Theory of estimation** Introduction, criteria of a good estimator – unbiasedness, consistency, efficiency, & sufficiency. Statement of Neyman's factorization theorem. Estimation of parameters by the method of moments and maximum likelihood (M.L), properties of MLE's (statements only). Binomial, Poisson & Normal population parameters estimate by MLE method.	**15**

	Interval estimation – construction of confidence intervals for population mean using normal distribution.	
III	**Testing of Hypothesis** Concepts of Statistical hypotheses, Null and Alternative hypothesis, Critical region, Type I and II errors, level of significance and Power of a test. One and two tailed tests, p-value. Neyman-Pearson's lemma. Examples in case of Binomial, Poisson, Exponential and Normal distributions.	**12**
IV	**Large sample Tests** Test for single mean and difference of two means, test for single proportion and difference of proportions. Simple Problems. **Small Sample tests - I** t-test for single mean, difference of means and paired t-test. F-test for equality of population variances. Simple Problems.	**12**
V	**Small Sample tests - II** χ2-test for goodness of fit and independence of attributes **Non – Parametric Tests** Non-parametric tests- Advantages and Disadvantages, Measurement scales - Nominal, Ordinal, Interval and Ratio. One sample tests – Sign and Run test. Two sample tests - Median test, Wilcoxon–Mann-Whitney U test, Kruskal – Wallis test or H- test, Run test. Simple Problems.	**12**

Text Book:

Fundamentals of Mathematical Statistics, 11th Edition, 2010, S. C. Gupta and V. K. Kapoor, Sultan Chand & Sons, New Delhi

Reference Books:

1. B.A/B.Sc. Second Year Statistics(2010) , Telugu Akademi, Hyderabad.
2. Mathematical Statistics with Applications, 2009, K.M.Ramachandran and Chris P.Tsokos Academic Press(Elsevier), Haryana .
3. Probability and Statistics, Volume I & II, D. Biswas, New central book Agency (P) Ltd, NewDelhi.
4. An outline of Statistical theory, Volume II,3rd Edition,2010(with corrections) A.M.Goon,M.K. Gupta, B.Dasgupta ,The World Press Pvt.Ltd., Kolakota.

Sanjay Arora and Bansi Lal:. New Mathematical Statistics, Satya Prakashan , New Delhi.

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Model Question Paper Structure for SEE

Max.: 75 Marks **Min.Pass: 30 Marks**

Statistical Inference

Section – A

Answer any FIVE of the following **5 x 5M = 25Marks**

1. Write the statements of Weak Law of large numbers and Central limit theorem.
2. Define F-distribution and write its applications.
3. Prove that sample mean is an unbiased and consistent estimator of population mean.
4. Define the following terms:

   (i) Null hypothesis (ii) Alternative hypothesis (iii) critical region.
5. Explain Type I and Type II errors.
6. Write the procedure for single mean in large sample tests.
7. Write the procedure of F-test for equality of population variances.
8. Explain the procedure of Sign test for single mean.

Section – B

Answer ALL questions **5 x 10M = 50Marks**

9. a. Define student's t-distribution. Write its applications and their properties.

   (OR)

   b. Define chi-square distribution. Write its applications and their properties.

10. a. Explain the characteristics of a good estimator

    (OR)

    b. Find Maximum likelihood estimator for μ and σ^2 in normal population.

11. a. State and prove Neyman-Pearson's lemma.

(OR)

b. If $x \geq 1$ is the critical region for testing $H_0: \theta=2$ vs $H_1: \theta=1$ on the basis of the single observation from an exponential distribution with probability density function $f(x, \theta)= \theta e^{-\theta x}$. Obtain the value of Type I and Type II errors.

12. a. In a Survey of buying habits, 400 women shoppers are chosen at random on supermarket 'A' located in a certain section of the city. Their average weekly food expenditure is Rs.250 with a S.D. of Rs. 40. For 400 women shoppers are chosen at random on Supermarket 'B' in another section of the city, the average weekly food expenditure is Rs.220 with a S.D. of Rs 55.Test at 1% level of significance whether the average weekly food expenditure of the populations of shoppers are equal.

(OR)

b. Explain the procedure of t- test for difference of means.

13. a. Out of 8,000 graduates in a town 800 are females, out of 1,600 graduate employees 120 are females. Use χ^2 to determine if any distinction is made in appointment the basis of sex.

(OR)

b. Explain the procedure of Wald-Wolfowitz run test for two samples.

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CO PO MAPING

Course Code : TEL T01A SEMESTER III/IV

COURSE NAME	COURSE OUT COMES NO	COURSE OUT COMES	PO NO.
B.A., B.B.A. B.B.A. B.A. B.COM (TPP) B.COM (A & F) B.COM (GEN) B.COM (C.A.) B.COM (BPM) B.COM (CA) B.C.A. B.Sc. (MPC) B.Sc. (BZC) B.Sc. (M.E.Cs) B.Sc. (M.PCs) B.Sc. (M.S.Cs) B.Sc. (CAME) B.Sc. (CAMS) B.Sc. (MSDS) B.Sc. (CSCS)	CO 1	వర్ణము, పదము, వాక్యములతో భాషాస్వరూపాన్ని పరిస్తూ పూర్ణంగా తెలుసుకొని చక్కని వ్యవహార వైఖరి ప్రదరిస్తారు.	6
	CO 2	సమాజ స్వరూపాన్ని సాహిత్య ప్రక్రియల ద్వారా పూర్తిగా అవగతం చేసుకొని జీవితాన్ని పరిపూర్ణంగా సాధించగలుగుతారు.	4
	CO 3	వివిధ భాషల పై సంప్రదాయము, సంస్కృతుల ప్రభావాన్ని భిన్న సమాజ దృక్పథాన్ని అవగాహన చేసుకుంటారు.	1
	CO 4	సమాజంలో ప్రసార మాధ్యమాల కృషిని గమనిస్తూ చైతన్యవంతమైనస్ఫూర్తిదాయకమైన జీవితాన్ని గడుపుతారు.	3
	CO 5	చక్కని విలువలతో అందర్నీ కలుసుకుంటూ సహజ సిద్ధమైన నైపుణ్యాలని మరింత పెంపొందించగలుగుతూ ఆదర్శవంతులౌతారు.	2

CO – PO MATRIX

Academic Year 2020-21

Course Code : TEL T01A SEMESTER III/IV

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1		L					
CO2			M				
CO3							H
CO4				M			
CO5					H		

SYLLABUS పాఠ్యప్రణాళిక

TELUGU-III / IV **TELT01A** **Credits – 3**

యూనిట్-I వ్యక్తీకరణ నైపుణ్యాలు

1. భాష-ప్రాథమికాంశాలు:- భాష-నిర్వచనం, లక్షణాలు, ఆవశ్యకత, ప్రయోజనాలు.

2. 'వర్ణం-పదం-వాక్యం', వాక్య లక్షణాలు, సామాన్య-సంయుక్త-సంశ్లిష్ట వాక్యాలు.

3. భాషా నిర్మాణంలో 'వర్ణం-పదం-వాక్యం' ప్రాధాన్యత.

యూనిట్-II సృజనాత్మక రచన

4. కవితా రచన:- ఉత్తమ కవిత - లక్షణాలు.

5. కథా రచన:- ఉత్తమ కథ - లక్షణాలు.

6. వ్యాస రచన:- ఉత్తమ వ్యాసం - లక్షణాలు.

యూనిట్-III అనువాద రచన

7. అనువాదం:- నిర్వచనం, అనువాద పద్ధతులు.

8. అనువాద సమస్యలు:- భౌగోళిక, భాషా, సాంస్కృతిక సమస్యలు, పరిష్కారాలు.

9. అభ్యాసము:- ఆంగ్లం నుండి తెలుగునకు ఒక పేరాను అనువదించడం.

యూనిట్-IV మాధ్యమాలకు రచన-I:- ముద్రణ / ప్రింట్ మీడియా

10. ముద్రణా మాధ్యమం / అచ్చు /:- పరిచయం, పరిధి, వికాసం.

11. వివిధ రకాల పత్రికలు - పరిశీలన, పత్రికా భాష, శైలి, వైవిధ్యం.

12. పత్రికా రచన:- వార్తా రచన, సంపాదకీయాలు, సమీక్షలు - అవగాహన.

యూనిట్-V మాధ్యమాలకు రచన-II:- ప్రసార మాధ్యమం / ఎలక్ట్రానిక్ మీడియా

13. ప్రసార మాధ్యమాలు:- నిర్వచనం, రకాలు, విస్తృతి, ప్రయోజనాలు.

14. శ్రవణ మాధ్యమాలు-రచన:- రేడియో రచన, ప్రసంగాలు, నాటికలు, ప్రసార సమాచారం.

15. దృశ్య మాధ్యమాలు-రచన:- వ్యాఖ్యానం / యాంకరింగ్, టెలివిజన్ రచన.

ఆధార గ్రంథాలు / వ్యాసాలు:

1. వ్యక్తీకరణ నైపుణ్యాలు-చూ.

1. ఆధునిక భాషా శాస్త్ర సిద్ధాంతాలు - ఆచార్య పి.ఎస్. సుబ్రహ్మణ్యం. 2. తెలుగు భాషా చరిత్ర - సం.ఆచార్య భద్రిరాజు కృష్ణమూర్తి.
3. తెలుగు వాక్యం - డా.చేకూరి రామారావు.

2. ఉత్తమ కవిత-లక్షణాలు - చూ. 1.నవ్యకవిత్వ లక్షణములు-ఆచార్య సి.నారాయణరెడ్డి. 2.ఆధునికాంధ్ర కవిత్వము-సంప్రదాయములు, ప్రయోగములు: చతుర్థ ప్రకరణము**3. ఉత్తమ కథ - లక్షణాలు - చూ.** 1. కథా శిల్పం - వల్లంపాటి వెంకట సుబ్బయ్య, పుటలు:11-17

4. ఉత్తమ వ్యాసం - లక్షణాలు - చూ. 1. చదువు-సంస్కృతి (వ్యాసం) - కొడవటిగంటి కుటుంబరావు.

5. అనువాద రచన - చూ. 1. అనువాద సమస్యలు - రాచమల్లు రామచంద్రారెడ్డి, పుటలు: 61-75, 85-94
2. అనువాద పద్ధతులు ఆచరణ సమస్యలు-చేకూరి రామారావు 3.'భాషాంతరంగం',పుట:130-146, తెలుగు విశ్వవిద్యాలయం ప్రచురణ.

6. ముద్రణా మాధ్యమం-చూ. 1. మాధ్యమాలకు రచన, పుటలు: 9-12, డా.బి.ఆర్. అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ.

7. పత్రికా భాష-చూ. 1. మాధ్యమాలకు రచన, పుటలు: 67-74, డా.బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ.

8. పత్రికా రచన- చూ. 1. తెలుగు-మౌలికాంశాలు, పుటలు: 59-69, డా.బి.ఆర్. అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ.

9. ప్రసార మాధ్యమాలు- చూ. 1. మాధ్యమాలకు రచన, పుటలు: 3-10, డా.బి.ఆర్. అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ.

10. రేడియో రచన- చూ. 1. మాధ్యమాలకు రచన, పుటలు: 141-148, డా.బి.ఆర్. అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ.

11. వ్యాఖ్యానం/యాంకరింగ్ - చూ. 1. మాధ్యమాలకు రచన, పుటలు: 178-181, డా.బి.ఆర్. అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ.

12. టెలివిజన్ రచన- చూ. 1. మాధ్యమాలకు రచన, పుటలు:153-160, డా.బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయం ప్రచురణ.

13. తెలుగు జర్నలిజం- డా. బూదరాజు రాధాకృష్ణ.

నమూనా ప్రశ్నపత్రం

Course Code: TEL T01A (Telugu-III/IV) **Max. Marks: 75M**
Time: 3 Hrs. **Pass Min. : 30M**

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అ-భాగం

I. క్రింది వానిలో ఐదింటికి సంగ్రహరూప సమాధానాలు వ్రాయండి. ఎనిమిదవ ప్రశ్నకు సమాధానం తప్పనిసరిగా వ్రాయాలి. **5 × 5 = 25మా**

1. భాష - ప్రయోజనాలు. **L2**
2. ఉత్తమ వ్యాసం - లక్షణాలు. **L1**
3. అనువాద సమస్యలు. **L2**
4. సంపాదకీయాలు. **L3**
5. టెలివిజన్ రచన. **L6**
6. ఉత్తమ కథ - లక్షణాలు. **L2**
7. సమీక్షలు - అవగాహన. **L2**
8. క్రింది అంశాన్ని నుడికారం చెడకుండా తెలుగులోకి అనువదించండి. **L2**

   To many, Indian thought, Indian manners, Indian customs, Indian philosophy, Indian literature are repulsive at the first-right, but let them preservere, let then read, let them become familiar with the great principles underlying these ideas, and it is ninety-nine to onethat the charm will come over them, and fascination will be the result. Slow and silent, as the gentle dew that falls in the morning, unseen and unheared yet producing, a most tremendous result, has been the work of the calm, patient, all-suffering spiritual race upon the world of thought.

ఆ-భాగం

II. క్రింది వానిలో ఐదింటికి వ్యాసరూప సమాధానాలు వ్రాయండి: **5 × 10 = 50మా**

9. భాషా నిర్మాణంలో 'వర్ణం-పదం-వాక్యా'ల ప్రాధాన్యతను వివరించండి. **L1**
10. ఉత్తమ కవితా లక్షణాలను విశ్లేషించండి. **L2**
11. అనువాద లక్షణాలను తెల్పి, పద్ధతులను రాయండి. **L3**
12. ముద్రణా మాధ్యమాన్ని వివరించి, దాని పరిధి వికాసాలను తెల్పుము. **L2**
13. యాంకరింగ్ నిర్వహణ, తీరు తెన్నుల్ని తెల్పండి. **L6**
14. పత్రికా భాష - శైలి - వైవిధ్యాన్ని వివరింపుము. **L2**
15. సామాన్య-సంయుక్త-సంశ్లిష్ట వాక్యాలను వివరింపుము. **L1**
16. ప్రసార మాధ్యమాల విస్తృతి, ప్రయోజనాలను సమీక్షించండి. **L2**

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P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

(An Autonomous College under the Jurisdiction of Krishna University)

Re – Accredited at 'A^{+}' by NAAC – III Cycle

College with Potential for Excellence (Awarded by the UGC)

ISO 9001 – 2015 Certified

OPERATING SYSTEMS LAB

Offered To:	B. Sc. (MPCS, MECS, CAME, MSCS, CAMS)	**Course Code:**	CSCP41C
Course Type:	Core (Practical)	**Course:**	Operating systems Lab
Year of Introduction:	2021 – 2022	**Year of offering:**	2021 – 2022
Year of Revision:	-	**Percentage of Revision:**	-
Semester:	IV	**Credits:**	1
Hours Taught:	30 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Basic Knowledge in OS concepts, data structures and C programming language.

Course Description:

This course deals with training students in developing and implementing logics for various OS scheduling algorithms. It also enables students to gain practical knowledge in implementing various UNIX commands.

Course Objective:

The Purpose of this course is to have students understand and the principles in the design and implementation of operating system software.

Course Outcomes: At the end of this course, students should be able to

CO 1. Implementing DOS & UNIX Commands (PO5, PO6, PO7)

CO 2. Implementing CPU Scheduling Algorithms (PO5, PO6, PO7)

CO 3. Implementing CPU Scheduling Algorithms, Deadlocks Avoidance, Prevention & Memory Management Techniques (PO5, PO6, PO7)

CO 4. Implementing Contiguous Memory Allocation Techniques & Page Replacement Algorithms (PO5, PO6, PO7)

CO 5. Implementing File allocation Strategies (PO5, PO6, PO7)

Lab Exercises

1. **DOS -** Internal Commands
2. **UNIX Commands**

1. In your home directory create a directory named DIR
2. Copy all files whose filenames satisfy the following conditions to ~/DIR. The files are in /usr/include directory, their names start with m, end with .h and contain a number.
3. Create a subdirectory called SUBDIR in your DIR directory.
4. The first five lines of each file you have copied from /usr/include copy to file ~/DIR/ SUBDIR/first five.
5. The last lines of files in ~/DIR copy to file ~/DIR/SUBDIR/last.
6. Concatenate the two files in ~/DIR/SUBDIR into one file ~/DIR/SUBDIR/first and last
7. Delete the files in ~/DIR/SUBDIR except first and last.
8. Store the number of files and directories in ~/DIR into a file ~/DIR/SUBDIR/count
9. Output the long information in the ~/DIR/SUBDIR directory. (Not its content, but information on it).
10. Delete the contents of ~/DIR/SUBDIR/first and last file without removing the file itself.
11. Add a line containing just a star sign (i.e. *) to file ~/DIR/SUBDIR/first and last.
12. Delete ~/DIR together with all the files it contains.
13. Output lines number 11-20 from file /etc/passwd.

3. List of Programmes

1. Write a Program to implement First Come First Serve Scheduling algorithm
2. Write a Program to implement Shortest Job First Scheduling algorithm
3. Write a Program to implement Round Robin Scheduling algorithm
4. Write a Program to implement Priority Scheduling algorithm
5. Write a program to implement Worst Fit Contiguous Memory Allocation
6. Write a program to implement Best Fit Contiguous Memory Allocation
7. Write a program to implement First Fit Contiguous Memory Allocation
8. Write a program to implement First In First Out Page replacement Algorithm
9. Write a program to implement First In Least Recently Used Page replacement Algorithm
10. Write a program to implement First In Optimal Page replacement Algorithm

P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

(An Autonomous College under the Jurisdiction of Krishna University)

Re – Accredited at 'A⁺' by NAAC – III Cycle

College with Potential for Excellence (Awarded by the UGC)

ISO 9001 – 2015 Certified

OPERATING SYSTEMS

Offered To:	B. Sc. (MPCS, MECS, CAME, MSCS, CAMS)	**Course Code:**	CSCT41C
Course Type:	Core (Theory)	**Course:**	Operating systems
Year of Introduction:	2021 – 2022	**Year of offering:**	2021 – 2022
Year of Revision:	-	**Percentage of Revision:**	-
Semester:	IV	**Credits:**	4
Hours Taught:	60 hrs. per semester	**Max. Time:**	3 Hrs

Course Prerequisites (if any): Basic Knowledge in computers, data structures and C programming language.

Course Description:

This course provides basic knowledge about operating system functions, its architectural design along with implementation of various scheduling algorithms. This course also provides knowledge in handling deadlock situation.

Course Objectives:

The Purpose of this course is to give students an idea of the services provided by the operating system,structure, organization of the file system, process synchronizations, scheduling and memory management.

Course Outcomes: At the end of this course, students should be able to

1**. Understand** Operating System Architectural design and its services. (PO5, PO6, PO7)

2. **Implementation** of Scheduling Algorithms. (PO5, PO6, PO7)

3. **Analyse** memory management techniques, concepts of virtual memory and disk scheduling. (PO5, PO6, PO7)

4. **Understand** the implementation of file systems and directories with the interfacing of IO devices with the operating system. (PO5, PO6, PO7)

5. **Identify** the deadlock situation and provide appropriate solutions so that protection and security of the operating system is also maintained. (PO5, PO6, PO7)

Syllabus		
Unit	**Learning Units**	**Lecture Hours**
I	**Operating System**: Introduction, Operating Systems Objectives and functions, Computer System Architecture, OS Structure, OS Operations. Evolution of Operating Systems , Types of operating system - Simple, Batch, Multi programmed , Time shared , Parallel, Distributed Systems, Real-Time Systems, Operating System services.	11
II	**Process and CPU Scheduling** – Process concepts , The Process, Process State, Process Control Block, Process communication, Threads. Process Scheduling -Scheduling Queues, Schedulers, Context Switch, Pre-emptiveScheduling, Dispatcher, , Scheduling Criteria, Scheduling algorithms, Case studies: Linux, Windows. Process Synchronization - The Critical section Problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, and Monitors.	13
III	**Memory Management and Virtual Memory** – Logical & physical Address Space, Swapping, Contiguous Allocation , Paging-Structure of Page Table, Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement , Page Replacement Algorithms, Allocation of Frames.	13
IV	**File System Interface** – The Concept of a File, Accessmethods, Directory Structure, ,File System Mounting , File Sharing, Protection, File System Structure, Mass Storage Structure - Overview of Mass Storage Structure , Disk Structure, Disk Attachment, Disk Scheduling.	12
V	**Deadlocks** – System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.	11

Prescribed Textbooks			
	Author	**Title**	**Publisher**
1	Silberschatz, Galvin, Gagne	Operating System Concepts, eight Edition	John Willey & Sons INC

Reference Textbook			
	Author	**Title**	**Publisher**
1	Abraham Silberchatz, Peter B. Galvin, Greg Gagne	Operating System Principles, 8th Edition	Wiley Student Edition
2	NareshChauhan,	Principles of Operating Systems	OXFORD University Press

Course Delivery method: Face-to-face / Blended

Course has focus on: Skill Development

Co-curricular Activities: Programming Contests, Assignments & Quiz.

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OPERATING SYSTEMS

MODEL QUESTION PAPER

COURSE CODE: CSCT41C TITLE OF PAPER: OPERATING SYSTEMS

CLASS / GROUP: B.Sc(MPCS, MECS, CAME, MSCS, CAMS) SEMESTER: IV

Time: 3 Hrs. Max. Marks: 75

****

SECTION – A

Answer any <u>FIVE</u> questions: 5 X 5 = 25 Marks

1. Explain computer system architecture with a neat diagram. (CO1, L2)
2. Write about process states with a neat diagram. (CO1, L2)
3. Explain about context switching. (CO2, L2)
4. Write short notes on swapping. (CO3, L2)
5. Write about logical and physical address spaces. (CO3, L2)
6. Write about different file access methods. (CO4, L2)
7. What are the necessary conditions for deadlocks? (CO5, L2)
8. Explain how dead locks can be recovered. (CO5, L2)

SECTION – B

Answer <u>ALL</u> questions: **5 X 10 = 50 Marks**

9. (a). Define operating system and explain its functions. (CO1, L2)

OR

(b.) Explain about various types of operating systems. (CO1, L2)

10. (a) Explain SJF and priority scheduling algorithms with an example. (CO2, L2)

OR

(b) Explain about inter process communication. (CO2, L2)

11. (a) Discuss the concept of paging with neat diagram. (CO3, L2)

OR

(b) Consider the following page reference string and calculate the number of page faults by using FIFO and LRU with three frames.

7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1 (CO3, L2)

12. (a). Explain in detail file operations. (CO4, L2)

OR

(b). Discuss about FCFS disk scheduling and SSTF scheduling with a suitable example. (CO4,L2)

13. (a) what is deadlock ?explain deadlock preventions methods. (CO5, L2)

OR

(b) Explain banker's algorithm for deadlock avoidance.(CO5, L2)

Parvathaneni Brahmayya Siddhartha College of Arts & Science, Vijayawada-10
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DEPARTMENT OF ENGLISH

Course Structure and Syllabi under CBCS

Sl No.	Semester	Course Code	Name Of The Subject	Teaching Hours	Credits
1	**III Semester**	**ENG T01A**	**English praxis -III**	4	3

OBJECTIVE: The main objective of this course is to enrich students' abilities to speak fluently, participate confidently in any social interaction, face any professional discourse, demonstrate critical thinking and enhance conversational skills by deserving the professional interviews.

COURSE OUT COMES: At the end of the course the learners will be able to:

CO 1. Analyse interpret, appreciate and comprehend the specified text and the contexts in terms of their content, purpose and form.
PO1

CO 2. Comprehend effectively for a variety of professional and social settings, adapting other writer's ideas as they explore and develop their own. **PO2**

CO 3. Engage in simple, common and basic social and academic conversations, demonstrating the ability to open and close a conversation and to ask for clarification, information or assistance, as well as agreeing/disagreeing and giving examples. **PO2**

CO 4. Convey their own interpretations by building dialogues and developing the learner's performance level in spoken English through the activities. **PO7**

CO 5. Acquaint the learner with the skills to debate, describe and role play. **PO3**

CO-PO MATRIX- ENG T01A							
CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	M						
CO2		M					
CO3		H					
CO4							H
CO5						H	

GENERAL ENGLISH SYLLABUS FOR B.A/ B.COM/B.SC COURSES UNDER CBCS

SEMESTER-III

Course Code: ENG T01A **Max. Marks: 100**
No. of Hours per Week: 4 **External: 75M**
No. of Credits: 3 **Internal: 25M**

A COURSE IN CONVERSATIONAL SKILLS

Learning Outcomes

By the end of the course the learner will be able to:

- Speak fluently in English
- Participate confidently in any social interaction
- Face any professional discourse
- Demonstrate critical thinking
- Enhance conversational skills by observing the professional interviews

I. UNIT

Speech Skills: 1. Tryst with Destiny Jawaharlal Nehru
Skills: 2. Greetings
3. Introductions

II. UNIT

Speech: 1. Yes, We Can Barack Obama
Interview: 2. A Leader Should Know How to Manage Failure Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton
Skills: 3. Requests

III. UNIT

Interview: 1. Nelson Mandela's Interview with Larry King
Skills: 2. Asking and Giving Information
3. Agreeing and Disagreeing

IV. UNIT

Interview: 1. JRD Tata's Interview with T.N.Ninan
Skills: 2. Dialogue Building
3. Giving Instructions/Directions

V. UNIT

1. **Speech**: 1. You've Got to Find What You Love Steve Jobs
Skills: 2. Debates
3. Descriptions
4. Role Play

QUANTITATIVE APTITUDE

Periods per week: 2hr **Total periods: 30**

Course code: LSC T14

Course Objective:

Intended to inculcate quantitative analytical skills and reasoning as an inherent ability in students.

Course Outcomes:

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

Understand the basic concepts of arithmetic ability, quantitative ability, logical reasoning, business computations and data interpretation and obtain the associated skills.

Acquire competency in the use of verbal reasoning.

Apply the skills and competencies acquired in the related areas

Solve problems pertaining to quantitative ability, logical reasoning and verbal ability inside and outside the campus.

UNIT – 1: (10Periods)

Arithmetic ability: Algebraic operations BODMAS, Square roots and Cube roots, Fractions, Divisibility rules, Unit digit, Total number of factors, LCM & GCD (HCF).

UNIT – 2: (10Periods)

Quantitative aptitude: Averages, Ratio and proportion, Problems on ages, Time, distance &speed, Problems on Trains.

Business computations: Percentages, Profit & loss, Partnership, simple and compound interest, Time & work, Allegations or Mixture.

UNIT – 3: (10Periods)

Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line graphs.

Text Books:

1. Quantitative Aptitude for Competitive Examination by R.S. Agrawal, S.ChandPublications.

Reference Books:

1. Analytical skills by Showick Thorpe, published by S Chand And Company Limited,Ramnagar, NewDelhi-110055
2. Quantitative Aptitude by R V Praveen, PHIpublishers.
3. Quantitative Aptitude for Competitive Examination by Abhijit Guha, Tata Mc Graw Hill Publications.

Links:

1. https://www.indiabix.com/
2. https://www.adda247.com/
3. https://www.smartkeeda.com/test/Quantitative_Aptitude/R_Updated/all/

- 10 marks for surprise tests/online tests
- 40 marks for semester end examination (objective type).Each question carries half

mark only.

QUANTITATIVE APTITUDE

MODEL PAPER

TIME:2HRS **MAX.MARKS:40M**

COURSE CODE: LSC T14 **Roll no:**

Choose the correct answer from the following.. (80questions* ½ =40M)

1. The difference between a number and its three-fifth is 50. What is the number?

a) 75 b) 100 c) 125 d) 150 e)NoneOfThese.

2. How many numbers between 1 and 400 are such which are exactly divisible by 7?

a) 31 b) 43 c) 57 d) 64 e)NoneOfThese.

3. If the sum of a number and its square is 182. Find the number.

a) 15 b) 14 c) 17 d) 16 e)NoneOfThese.

4. The sum and product of two numbers are 12 and 35 respectively. The sum of their reciprocals will:

a) 1/3 b) 35/12 c) 1/5 d) 12/35 e)NoneOfThese.

5. If HCF and LCM of two numbers are 11 and 693 respectively. If one of the numbers is 99, then find the second number.

a) 66 b) 77 c) 88 d) 55 e)NoneOfThese.

6. Find the smallest number which is divided by 15,20 and 35, leave in each remainder 8,is

a) 428 b) 328 c) 214 d) 420 e)NoneOfThese.

7. Find the HCF of 56, 216 and 28.

a) 28 b) 56 c) 216 d) 4 e)NoneOfThese.

8. The least multiple of 7, which leaves a remainder of 4, when divided by 6,9,15 and 18 is:

a) 74 b) 94 c) 184 d) 364 e)NoneOfThese.

9. Two numbers are in the ratio 3: 4 and their HCF is 4.Their LCM is:

a) 12 b) 16 c) 24 d)48 e)NoneOfThese.

10. Find the value of 0.09 x 7.3.

a)1/3 b)2/3 c)3/4 d)4/5 e)NoneOfThese.

11. What is the units place in (1432^{1432} X 1836^{1832} X 1835^{1735})?

a)0 b)1 c)8 d)9 e)NoneOfThese.

12. If 1/5 :1/x :: 1/x : 1/1.25 then the value of x is:

a) 1.5 b) 2 c) 2.5 d) 3.5 e)NoneOfThese.

13. Find the mean proportional between 0.08 & 0.18 is:

a) 0.12 b) 1.2 c) 0.012 d) 0.0012 e)NoneOfThese.

14. If x:y = 5:2 then (8x + 9y) : (8x +2y) is:

a) 33:24 b) 35:27 c) 27: 28 d) 29:22 e)NoneOfThese.

15. The ratio of the number of boys and girls in a college is 7:8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio?

a) 8:9 b) 17:18 c) 21:22 d) 22:21 e)NoneOfThese.

16. In a college the ratio of female to male students is 11:14.Then what is number of students of the class is female?

a)Can't say b)620 c)720 d)420 e)NoneOfThese.

17. Two numbers are in the ratio of 1:2.If each number is increased by 7,the ratio becomes 3:5.The greatest numbers is:

a) 24 b) 26 c) 28 d) 32 e)NoneOfThese.

18. Rs.1210 were divided among A,B,C so that A:B =5:4 and B:C =9:10.Then C gets:

a) Rs.340 b) Rs.400 c) Rs.450 d) Rs.475 e)NoneOfThese.

19. If Rs.1100/- is divided between A and B in the ratio of 1/5:1/6.Find B's share.

a) Rs.600 b) Rs.625 c) Rs.650 d) Rs.500 e)NoneOfThese.

20. If A: B=4:3 and B: C=7:2. Find A:B:C.

a)18:15:20 b)14:9:13 c)17:9:13 d)19:12:20 e)NoneOfThese.

21. 40% of a number is equal to 3/5 of another number. What is the ratio between the first number and the second number?

a) 3:2 b) 2:3 c) 3:4 d) 4:5 e)NoneOfThese.

22. In a camp, 95 men had provisions for 200 days. If after 5 days, 30 men left the camp, how long will food last now?

a)180 days b)285 days c)320 days d)315 days e)NoneOfThese.

23. 20 men complete one-third of a piece of work in 20 days. How many more men should be employed to finish the rest of work in 25 more days?

a) 10 b) 12 c) 20 d) 15 e)NoneOfThese.

24. If 36 men can complete a piece of work in 18 days. In how many days will 27 men complete the same work?

a) 12 b) 18 c) 22 d) 24 e)NoneOfThese.

25. If the capitals of P & Q are in the ratio of 7:9 and the times of their investments are in the ratio 18:21.Then find their Profits Ratio?

a) 14:15 b) 7:5 c) 2:3 d)5:9 e) NoneOfThese.

26. A, B and C together started a business and their capitals are in the ratio 3:4:5 the timing of their investments being in the ratio 4:5:6. In what ratio would their profits be distributed?

a) 8:15:30 b) 12:20:15 c) 4:5:6 d) 6:10:15 e) NoneOfThese.

27. In a business A, B and C invested Rs.35000, Rs.45000 & Rs.55000 respectively. Find the share of A in the total profit of Rs.40, 500.

a) Rs.10600 b) Rs.10800 c) Rs.10400 d) Rs.10500 e)NoneOfThese.

28. P, Q entered into a partnership with Rs.30000 and Rs.60000 respectively. After 4 months P invested Rs.15000 more while Q withdrew Rs.30000.Find the share of P profit in the annual profit of Rs.1, 00,000.

a) Rs.60000 b) Rs.64000 c) Rs.50000 d) Rs.35000 e)NoneOfThese.

29. An amount is distributed among P, Q and R in the ratio 5:3:6.If R gets Rs.600 more than Q. What is the difference between P's and Q's share?

a) Rs.200 b) Rs.800 c) Rs.600 d) Rs.400 e)NoneOfThese.

30. A, B and C enter into a partnership. A invest Rs.6500 for 6months, B invest Rs.8400 for 5 months and C investRs.10000 for 3months. A wants to be the working partner for which he was to received 5% of the profits. The profit earned was Rs.7400.Find B' share?

a) Rs.2625 b) Rs.2500 c) Rs.2660 d) Rs.2835 e)NoneOfThese.

31. Two-fifth of one-third of three-seventh of a number is 15. What is 40 percent of that number?

a) 72 b) 52 c)62 d) 105 e)NoneOfThese.

32. If 120 is 20% of a number, then 120% of that number will be:

a) 60 b) 360 c) 720 d) 420 e)None of these.

33. 75% of a number when added to 75 is equal to the number. The number is:

a) 250 b) 200 c) 300 d) 320 e)None of these

34. If each side of a square is increased to 20%, then find the change in area of the square.

a) Does not change b) 40%↑ c) 22%↑ d) 44% ↑ e)None of these.

35. By how much is 30% of 80 greater than $4/5^{th}$ of 25?

a) 8 b) 12 c) 4 d) 2 e)None of these.

36. If A's salary 40% less than the B' salary, by how much percent is B's salary more than A?

a) 66.66% b) 16.66% c) 33.33% d) 35% e)None of these.

37. Passing marks of an exam is 30% of total marks. If A got 20% of the total marks and failed by 72 marks then find the maximum marks in the examination.

a) 360 b) 180 c) 1440 d) 720 e)NoneOfThese.

38. The ratio of cost price and selling price is 8:9.Find the profit per cent.

a)25% b)50% c)75% d)78% e)NoneOfThese.

39. Loss incurred by selling a car for Rs.252 is equal to the profit earned by selling it for Rs.548.What is the cost price in this case?

a)Rs.350 b)Rs.370 c)Rs.380 d)Rs.400 e)NoneOfThese.

40. A buys an article and sells it to B at a profit of 10%; B sells it to C gaining 20%. If C gives Rs.924, what did A give??

a)Rs.800 b)Rs.900 c)Rs.700 d)Rs.1050 e)NoneOfThese.

41. The average of five consecutive even numbers is 48.Find the smallest number.

a) 40 b) 42 c) 44 d) 46 e)NoneOfThese.

42. If 16a +16b =48, what is the average of 'a' and 'b'?

a) 2 b) 2.5 c) 3 d) 1.5 e)NoneOfThese.

43. Average temperature for Monday, Tuesday and Wednesday is 35^0c and that for Tuesday, Wednesday and Thursday is 36^0c. What is the temperature on Thursday, If temperature on Monday is 31^0c?

a) 31^0c b) 34^0c c) 35^0c d) 33^0c e)NoneOfThese.

44. A class 20 boys and 30 girls, the average age of boys is 11 years and of girls is 12 years. What is the average age of whole class?

a) 12 b) 10 c) 11.2 d) 11.6 e)NoneOfThese.

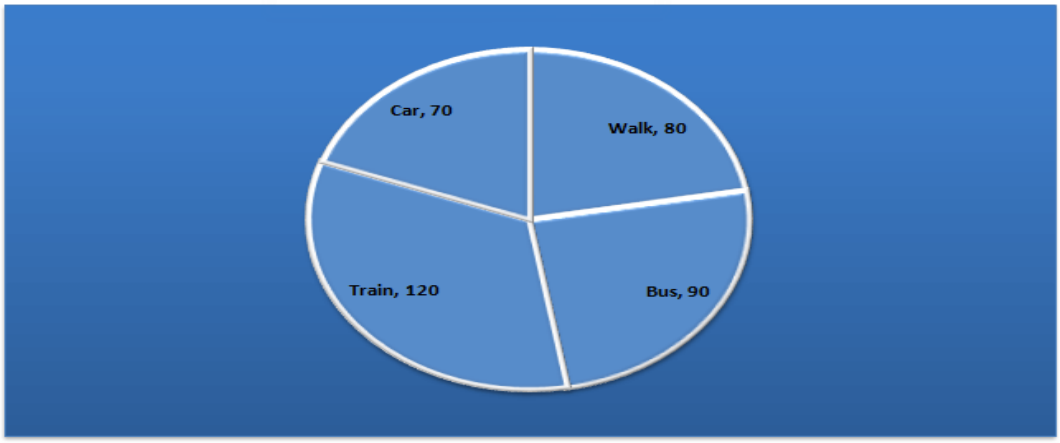
45. The average of 14 girls and their teacher's age is 15 years. If the teacher age is excluded, the average reduced by 1 year. What is teacher's age?

a) 35 years b) 32years c) 29years d) 34years e)NoneOfThese.

Directions (Q.No:46 to 50): The pie-chart given below represents the number of students using different transport to a school.

Total Number of students=2160

All data is in degrees



46. The number of students who come to school by car is

a) 70 b) 290 c) 420 d) 480 e) None of These

47. The ratio of the number of students who come to school by car to the number of students who come to school by bus is

a) 21: 24 b) 21: 27 c) 36: 27 d) 36: 21 e) None of These

48. The total number of students coming to school either by walking or by bus is

a) 480 b) 540 c) 1020 d) 170 e) None of These

49. The number of students who don't come to School by train is

a) 720 b) 1020 c) 2040 d) 1440 e) None of These

50. The number of students coming to school by bus is How much percentage more than the number of students coming to school by walking

a) 10% b) 12.5% c) 11% d) 11.5% e) None of These

51. Find the least value of '*' so that the number 26*54242 is divisible by 3

a)3 b)4 c)1 d)2 e)NoneOfThese.

52. Find 144 to prime factors

a)2x2x2x2x3x3 b)2x2x3x3 c)3x5x7 d)7x7x7 e)NoneOfThese.

8. Find the square root of 3249

a)67 b)55 c)54 d)57 e)NoneOfThese.

54. An amount doubles itself in 5 years with simple interest. What is the rate of interest per annum?

(a) 22% b) 20% c) 25% d) 26% e)NoneOfThese.

55. At what per cent of simple interest per annum will a sum of money become three times in 10 years?

(a) 5% b) 10% c) 15% d) 20% e)NoneOfThese.

56. Find the simple interest on Rs.5000 at 10% per annum for 4 years.

(a)Rs.1500 b) Rs.2000 c) Rs.2500 d) Rs.3000 e)NoneOfThese.

57. A sum of money amounts to Rs.900 in 2 years and to Rs.950 in 3 years. Find the sum.

a)Rs.700 b)Rs.500 c)Rs.600 d)Rs.800 e)NoneOfThese.

58. Find the compound interest on Rs.16000 at 20% per annum for 9 months, the interest being compounded quarterly?

a) Rs.2420 b) Rs.2500 c) Rs.2522 d) Rs.2530 e)NoneOfThese.

59. A sum of money invested at compound interest amount to Rs.800 in 3 years and to Rs.840 in 4 years. The rate of interest per annum is:

a)4% b)5% c)6% d)7% e)NoneOfThese.

60. If the simple interest on a sum for 2 years at the rate of 10% is 500.Then find compound interest for the same for same period.

a)Rs.550 b)Rs.540 c) Rs.525 d) Rs.520 e)NoneOfThese.

61. A mixture of 20kg of spirit and water contains 10% water. How much water must be added to this mixture to raise the percentage of water to 25%?

a) 4 kgb) 5 kgc) 8 kgd) 30 kge)NoneOfThese.

62. A grocer buys two kind of rice at Rs.18 and Rs.12 per kg respectively. In what proportion should these be mixed, so that by selling the mixture at Rs.17.50 per kg, 25% may be gained?

a) 2:1 b) 3:2 c) 3:4 d) 1:2e)NoneOfThese.

63. A can do a piece of work in 20 days while B can do it in 40 days. In how many days can A and B working together does it?

a)10 1/2 days b)11 1/3 days c)12 days d)13 1/3 days e)None of these

64. A and B can together do a piece of work in 12 days. A alone can do it in 20 days. In how many days B alone can do it?

a)20 days b)60 daysc)30 days d)40 dayse)NoneOfThese.

65. A can complete the work in 20 days, B in 30 days and C in 40 days. All started the work together. But after 5 days, A left. After 3 more days B also left the work. C can complete the remaining in how many days?

a)10 1/2 days b)11 1/3 days c) 19 days d)13 1/3 days e)None of these.

66. A can do a piece of work in 20 days. B is 25% more efficient than A. The number of days taken by B to do the same piece of work is:

a) 25 days b) 24 days c) 16 days d) 18 days e)None of these.

67. A car covers a distance of 720 km in 12 hours. What is the average speed of the car?

(a) 50kmph b) 60kmph c) 66kmph d) 36kmph e)Noneofthese.

68. A car travelling at a speed of 45 km/hr can complete a journey in 10 hours. How long will it take to travel the same distance at 50 km/hr?

(a) 6 hours b) 8 hours c) 4 hours d) 5hours e)None of these.

69. The speed of a car is 30kmph after completion every one hour the speed of the car is decreased by 2kmph. How much distance travelled by the car in 10hrs?

a)390km b)200km c)210km d)305km e)NoneOfThese.

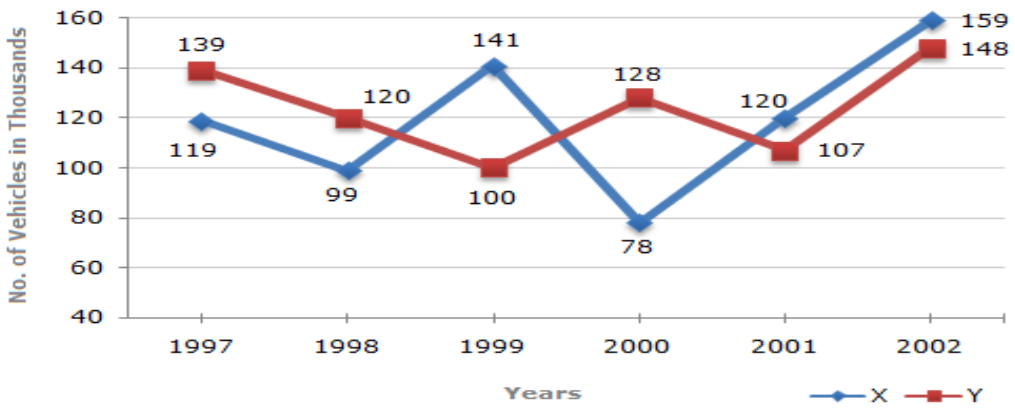
70. The speed of a car is 80km in the first hour and 60km in the second hour. What is the average speed of the car?

a)60kmph b)72kmph c)75kmph d)70kmph e)NoneOfThese.

Directions(Q.no-71 to 75):

Study the following line graph and answer the questions based on it.

Number of Vehicles Manufactured by Two companies over the Years (Number in Thousands)



71. What is the difference between the total productions of the two Companies in the given years ?

a)19000 b)22000 c)26000 d)28000 e)None of these.

72. What is the total number of vehicles manufactured by Company X over the given period ?

a)816000 b)700000 c)245000 d)589000 e)716000

73. In which of the following years, the difference between the productions of Companies X and Y was the maximum among the given years ?

a)1997 b)1998 c)1999 d)2001 e)2000

74. The production of Company Y in 2000 was how much more than the Company X in the same year ?

a)50000 b)65000 c)52000 d)15000 e)None of these.

75. What is the difference between the number of vehicles manufactured by Company Y in 2000 and 2001 ?

a)50000 b)42000 c)33000 d)21000 e)None of these.

Directions (Q.No:76 to 80): Study the following table carefully and answer the given questions.

Number of students studying in different standards of different schools.

Schools P, Q, R, S, T, U

Standards III, IV, V, VI, VII, VIII

	III	IV	V	VI	VII	VIII
P	38	50	58	48	54	42
Q	46	45	45	58	60	50
R	54	42	46	58	48	40
S	50	52	40	46	55	45
T	48	52	55	44	55	48
U	54	60	42	54	52	52

76.What is the approximate average number of students studying in standard III from all schools together?

a)42 b) 36 c) 48 d)54 e) None ofthese

77. Number of students studying in standard VI from school T is what percent of those studying in standard VI from school S?

a) 92.5%b)95.65% c) 86.45% d) 78.65% e) None ofthese

78. Which school has the highest total number of students from all the given standards together?

a)P b) Q c) S d) U e)R

79. Which standard has the lowest total number of students from all the given schools together?

a)III b) IV c) VId) VII e) VIII

80. What is the respective ratio of students studying in standard V of school P and Q together to those studying in standard VIII of schools R and S together?

a) 103: 85 b) 57: 54 c) 53: 52 d) 89: 83 e) None ofthese

DEPARTMENT OF MATHEMATICS

COURSE STRUCTURE

Semester	Course Code	Paper	Title of the paper	Total marks	Internal exam	Sem end exam	Teaching hours	credits
IV	MAT T41A	CORE	Linear Algebra	100	25	75	5	5

Programme Outcomes:

S.No	P. O
	At the end of the program the student will able to
1	Demonstrate the ability to use mathematical skills such as formulating and tackling mathematics related problems and identifying and applying approximate physical principles and methodologies to solve a wide range of problems associated with mathematics.
2	Apply the underlying unifying structures of mathematics and the relationships among them.
3	Investigate and apply mathematics problem and solutions in variety of contexts related to science and technology, business and industry.

Course Outcomes of MAT T

S. No	C.O	
	Upon successful completion of their course, students should have the knowledge and skills to	
1.	Knowledge in fundamental concepts of vector spaces.	L2, PO-1
2.	Ability to understand the basic concepts of Basis and Dimensions.	L2, PO-1
3.	Discuss the linear transformations, rank and nullity.	L2, PO-1
4.	Appreciation in the concept of matrices as a tool in solving system of linear equations and determining eigen values and eigen vectors.	L2, PO-1

CO-PO MATRIX							
CO-PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
CO1					**M**		
CO2					**H**		
CO3							**M**
CO4						**M**	
CO5							**M**

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE VIJAYAWADA-10

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

MATHEMATICS	**MAT T41A**	**2021 – 22 Onwards**	**B.A (EMS),B.Sc.(MPC,MPCS,MECS,CAME,MSCA,MSCS)**

LINEAR ALGEBRA

SEMESTER-IV **No of Credits: 5**

OBJECTIVE: TO ENHANCE THE ANALYTICAL SKILLS AND APPLICATION SKILLS.

UNIT I: Vector spaces (18hrs)

1.1 Vector space definition – general properties of Vector space.

1.2 subspace definition – theorems & related problems.

1.3 Linear sum of two subspaces, linear combination of vectors and linear span of a set – theorems &related problems.

1.4 Linear dependence of vectors - theorems & related problems.

1.5 Linear independence of vectors - theorems & related problems.

UNIT II: Basis and Dimension (18hrs)

2.1 Basis of a vector space – definition, Basis existence, Basis extension, Basis Invariance, theorems.

2.2 Coordinates – definition & related problems.

2.3 Dimension of a vector space, dimension of a subspace - theorems & related problems.

2.4 Quotient space, dimension of Quotient space - theorems.

UNIT III: Linear Transformation (18hrs)

3.1 Vector space homomorphism – definitions

3.2 Linear transformation, Properties of L.T., Determination of L.T. - theorems & related problems.

3.3 Sum of linear transformations, scalar multiplication of L.T., product of linear transformations, Algebra of linear operators - theorems & related problems.

3.4 Range & Null space of a L.T. – Definitions, theorems & related problems.

3.5 Rank nullity theorem - related problems.

UNIT IV: Matrices (18hrs)

4.1 Fundamentals of Matrices.

4.2 Elementary matrix operations & elementary matrices.

4.3 Rank of a matrix – definition, related problems.

4.4 Echelon form of a matrix, reduction to normal form, PAQ form, Inverse of a matrix – related problems only.

4.5 System of linear equations – homogeneous & non homogeneous linear equations - related problems.

4.6 Eigen values & Eigen vectors of a matrix – definitions, theorems & related problems.

4.7 Cayley - Hamilton theorem, related problems.

UNIT V: Inner product spaces (18hrs)

5.1 Inner product spaces – definition, Norm (or) Length of a vector - theorems & related problems.

5.2 Schwarz in equality, Triangle inequality, parallelogram law – theorems.

5.3 Orthogonality – orthogonal, orthonormal vectors, orthogonal set, orthonormal sets of I.P.S - theorems & related problems.

5.4 Gram- Schmid orthogonalization process, Bessel's Inequality and Parseval's Identity.

Prescribed Text book:				
S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1.	V. Venkateswara Rao, N. Krishna Murthy.	A text book of Mathematics for B.A/B.ScVol – III. (Pg No: 111-192; 232 – 321 & 339 – 389; 395 – 434).	S-Chand & Co.	2006

Reference Text books:				
S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHER	YEAR OF PUBLICATION
1.	J.N. Sharma and A. R. Vasistha	Linear Algebra	Krishna PrakashanMandir Meerut-250002.	
2.	Dr. A. Anjaneyulu	A Text Book of Mathematics B.A/B.Sc – Vol III	Deepthi Publications	3rd Edition 2006 – 2007

PARVATHANENI BRAHMAYYA SIDDHARTHA COLLEGE OF ARTS & SCIENCE:: VIJAYAWADA-10.

(An Autonomous College in the jurisdiction of Krishna University, Machilipatnam)

SEMESTER – IV **Model Paper**

COURSE CODE : MAT T41A **Time: 3hrs.**
TITLE OF THE PAPER : LINEAR ALGEBRA **Max. Marks: 75**

SECTION – A

Answer any FIVE of the following questions **5X5=25M**

1. The set W of ordered triads (x, y, 0) where x, y ϵ F is a subspace of $V_3(F)$. (CO1, L2)

2. If two vectors are linearly dependent, prove that one of them is a scalar multiple of the other. (CO1, L2)

3. Show that the set { (1,0,0), (1,1,0),(1,1,1) } is a basis of $C^3(C)$.Hence find the coordinates of the vector (3+4i, 6i, 3+7i) in $C^3(C)$. (CO2,L4)

4. Describe explicitly the linear transformation T: $R^2 \rightarrow R^2$ such that T(2, 3) = (4, 5) and T(1, 0) = (0,0) (CO3,L2)

5. Find the rank of the matrix $\begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$. (CO4,L2)

6. Solve the system $2x_1 - x_2 + x_3 = 0$, $3x_1 + 2x_2 + x_3 = 0$, $x_1 - 3x_2 + 5x_3 = 0$. (CO4,L2)

7. Show that zero is a characteristic root of a matrix if and only if the matrix is singular. (CO4,L2)

8. State & prove the Triangle Inequality. (CO5,L2)

SECTION -B

Answer the following questions. **5X10=50M**

9a) If S, T are the subset of a vector space V (F), then prove that

i) $S \subseteq T \Rightarrow$ (i) $L(S) \subseteq L(T)$

ii) L (S U T) = L(S) + L(T). (CO1,L2)

(OR)

9b). Let V (F) be a vector space and S = { $\alpha_1,\alpha_2,\alpha_3,\ldots\ldots\alpha_n$ } is a finite subset of non-zero vectors of V (F).Then S is linear dependent if and only if some vector $\alpha_k \in S$, $2 \leq k \leq n$, can be expressed as a linear combination of its preceding vectors**.** **(**CO1, L2)

10a) State and prove Basis extension theorem. (CO2, L2)

(OR)

10b) Let W be a subspace of a finite dimensional vector space V (F) then dim V/W = dim V – dim W. (CO2,L2)

11a) Find T (x, y, z) where T : $R^3 \rightarrow R$ is defined by T (1 , 1, 1) = 3; T(0, 1 ,-2) = 1; T(0, 0, 1) = -2. (CO3, L2)

(OR)

11b) State and prove Rank – nullity theorem. (CO3, L4)

12a) Show that the only number λ for which the system $x + 2y + 3z = \boldsymbol{\lambda}x$, $3x + y + 2z = \boldsymbol{\lambda}y$, $2x + 3y + z = \boldsymbol{\lambda}z$ has non-zero solutions is 6. (CO4,L2)

(OR)

12b) State and prove Cayley – Hamilton theorem. (CO4,L2)

13a) State and prove Cauchy – Schwarz's Inequality. (CO5,L4)

(OR)

13b) Given {(2,1,3), (1, 2, 3), (1, 1, 1)} is a basis of R^3; Construct an orthonormal basis. (CO5,L4)

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P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Siddhartha Nagar, Vijayawada – 520 010
Autonomous -ISO 9001 – 2015 Certified

Title of the Course : Applied Statistics Lab **Course Code : STAP01**
Offered to: B.Sc (M.S.Cs & Ca.M.S) **Semester: IV**
Course Type: Core (Practical) **Credits: 1**
Year of Introduction: 2021-22 **Lab Hours :** 30periods.
M**ax.Time: 2** Hours
Course Prerequisites: Students required knowledge in Mathematics and Statistical techniques

Course Description: This course provides the study of data related to population growth, construction index numbers. Also this course deals with industry problems and analyse and get solutions.

Course Objectives:
1) To enable the students to develop basic knowledge in Applied Statistics
2) To provide understanding in some advanced statistical techniques which are used for solving business problems.

Learning Outcomes: At the end of the course, the student will
1) have the hands on practice of working on the data and interpreting the results.
2) Acquire to apply the techniques related solve the real business problems.

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Programme Outcomes Mapping**
CO 1	Measure the Mortality and Fertility rates and the construction of Life tables	PO - 5
CO 2	construct the Quality Control charts for Variables and attribute charts	PO - 6
CO 3	Construct the various types of index numbers	PO - 6

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
	CO1					**H**		
	CO2					**M**		
	CO3						**M**	
	CO4					**H**		
STAP01	**CO5**						**H**	

List of Practicals

Practical No	Theme	Key Topics
Applied Statistics		
1	Control Charts	Construction of Mean & Range charts
2	Control Charts	Construction of p & c charts
3	Index Numbers	Construction of Weighted index numbers
4	Index Numbers	Testing of good index number
5	Index Numbers	Construction of Whole sale price index number
6	Vital Statistics	Determining of Mortality rates
7	Vital Statistics	Determining of Fertility & reproduction rates
8	Vital Statistics	Construction of life tables
9	Psychology & Education	Scaling of ratings using Normal distribution

Structure of Practical Paper

Total Marks: 50 Marks

(i) For Continuous Evaluation : 10 marks (Internal Evaluation)

(ii) For semester end Practical Examination: 40 marks (External Evaluation)

P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous -ISO 9001 – 2015 Certified

Title of the Course :Sampling Techniques and Design of Experiments Lab

Offered to: BA(EMS) & B.SC (M.S.Cs, M.S.Ca &M.S.Ds) **Course Code: STAP41B**

Course Type: Core (Practical) **Credits: 1**

Year of Introduction: 2021-22 **Semester: IV**

Hours Taught: 30periods **Max.Time: 2** Hours

Course Prerequisites (if any): Nil

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Programme Outcomes Mapping**
CO 1	To draw the sample from the population using sampling techniques	PO – 5
CO 2	To Construct suitable designed experiment for a given real life data.	PO - 6

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
STAT41B	**CO1**					**H**		
	CO2						**M**	
	CO3					**H**		
	CO4						**H**	
	CO5							**L**

List of Practicals

1. Simple random sampling with and without replacement. Comparison between SRSWR & SRSWOR
2. Stratified random sampling – proportional & optimum allocations. Comparison between proportional & optimum allocations with SRSWOR

3. Systematic sampling with N = nk. Comparison of systematic sampling with stratified and SRSWOR
4. Analysis of CRD
5. Analysis of RBD. Relative efficiency of RBD over CRD
6. Estimation of single missing observation in RBD and its analysis
7. Analysis of LSD. Relative efficiency of LSD over CRD and RBD
8. Estimation of single missing observation in LSD and its analysis
9. Analysis of 2^2 with RBD layout

Structure of Practical Paper

Total Marks: 50 Marks

(i) For Continuous Evaluation	**:**	**10 marks (Internal Evaluation)**
(ii) For semester end Practical Examination:		**40 marks (External Evaluation)**

P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Siddhartha Nagar, Vijayawada – 520 010
Autonomous -ISO 9001 – 2015 Certified
Applied Statistics

Offered to: BA(EMS) & B.SC (MSDS) / STAT01
Course Type: Core (Theory)
Year of Introduction: 2021 **Percentage of Revision: Nil**
Semester: III **Credits: 4**
Hours Taught: 60 periods. per Semester **Max.Time:** 3 Hours
Course Prerequisites: Students required knowledge in Mathematics and Statistical techniques
Course Description: This course provides the study of data related to population growth, construction index numbers.Also these courses deals with industry problems and analyses and get solutions.

Course Objectives:

1) To enable the students to develop basic knowledge in Applied Statistics
2) To provide understanding in some advanced statistical techniques which are used for solving business problems.

Learning Outcomes: At the end of the course, the student will

1) Have the hands on practice of working on the data and interpreting the results.
2) Acquire to apply the techniques related solve the real business problems.

S. No	Programme Outcomes
PO1	**Effective Communication**: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology
PO2	**Effective Citizenship**: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
PO3	**Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO4	**Environment and Sustainability**: Understand the issues of environmental contexts and sustainable development
PO5	**Critical Thinking**: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
PO6	**Specialized Skills / Transferable Skills:** Acquisition of communication and soft, analytical and technological skills that aid in enhancing
PO7	**Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Programme Outcomes Mapping**
CO 1	Measure the Mortality and Fertility rates and the construction of Life tables	PO - 4
CO 2	construct the Quality Control charts for Variables.	PO –6
CO3	construct the Quality Control charts for Attributes	PO –6
CO 4	Obtain the knowledge on asses the population growth by using vital statistics	PO - 7
CO 5	Helps asses the normalization processes of different scores and estimating the IQ levels.	PO - 6

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
	CO1					**H**		
	CO2						**M**	
	CO3						M	
	CO4						**H**	
STAT01	**CO5**						**H**	

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**Index Numbers** Basic problems involved in the construction of index numbers. Construction of index numbers - Simple aggregate, Weighted aggregate, Simple price relative and Weighted price relative methods. The criteria of good index number.Cost of living index number.Uses and Limitations of index numbers.	**12**
II	**Statistical Quality Control – I** Introduction.Basis of SQC.Uses of SQC.Types of controls – Process&Product.Construction of 3-σ limits. Construction of Mean ($\bar{x}$) and Range (R) charts.Interpretation of $\bar{x} and R charts$	**12**
III	**Statistical Quality Control – II** Construction of p and c charts - Fixed control limits. Interpretation of p and c - charts.Natural and Specification limits. Acceptance sampling inspection plans – AQL, LTPD, AOQL and ASN. OC curves.	**12**

IV	**Vital Statistics** Introduction, definition and uses of vital statistics, sources of vital statistics.Measures of different Mortality and Fertility rates, Measurement of population growth. Life tables: construction and uses of life tables.	**12**
V	**Statistics in Psychology & Education** Introduction.Scaling procedures – Scaling of scores – Z or σ scores, Standard and normalized scores, T and Percentile scores. Reliability of test scores – Def. index and parallel tests. Methods of determining test reliability. Validity of test scores.	**12**

Text Book:

1. S.C. Gupta, (2016), Seventh Edition, Fundamentals of Statistics, Mumbai: Himalaya Publishing House.

2. Fundamentals of Applied Statistics, 2014, S.C.Gupta and V.K. Kapoor;Sutan Chand &Sons , New Delhi.

Reference Books:

1. Levine, D.M., Berenson, M. L. & Stephan, D. (2012*), Statistics for managers using Microsoft*
Excel, New Delhi: Prentice Hall India Pvt.

2. Aczel, A. D. &Sounderpandian, J. (2011), *Complete Business Statistics*, New Delhi: Tata McGraw Hill.

3. Sharma, J. K. (2013), *Business statistics*, New Delhi: Pearson Education

4. Anderson, D., Sweeney, D., Williams, T., Camm, J., & Cochran, J. (2013), *Statistics for Business*
and Economics, New Delhi: Cengage Learning.

5.Agarwal, B.L. Basic Statistics, New Age International Publishers, New Delhi, 6th edition 2013

Websites of Interest: **http://onlinestatbook.com/rvls/index.html**

Co-Curricular Activities in the class:

1. Pictionary
2. Case Studies on topics in field of statistics
3. Snap test and Open Book test
4. Architectural – To be build the procedures
5. Extempore – Random concept to students
6. Interactive Sessions
7. Teaching through real world examples

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Model Question Paper Structure for SEE

Max.: 75 Marks **Min.Pass: 30 Marks**

Applied Statistics

Section – A

Answer any Five of the following **5 x 5M = 25M**

1. Define SQC and write its uses (L- 1, CO – 2)
2. Explain 3 –σ limits (L – 2, CO – 2)
3. What are the applications of C- chart (L – 3, CO – 3)
4. Explain base shifting in index numbers (L – 2, CO – 1)
5. From the following data calculate Index Number by simple (i) aggregate and (ii) relative method(L – 3, CO – 1)

Commodity	A	B	C	D
Price in 1980	162	256	257	132
Price in 1981	171	164	189	145

6. Explain the sources of vital statistics (L – 2, CO – 4)
7. Explain reproduction rates (L – 2, CO – 4)
8. Explain scaling methods (L – 2, CO – 5)

Section – B

Answer all the questions **5 x 10M = 50M**

9. (a) Explain the basic problems involved in the construction of index numbers (L – 2, CO – 1)

OR

(b) Find the cost of living index number by family budget method from the following data (L – 5, CO – 1)

Commodities	Base	Current	% of

	Year	Year	Weights
	Price	Price	
A	20	26	17
B	28	31	29
C	34	40	20
D	92	95	34

10. (a) Explain different fertility rates(L – 2, CO – 4)

OR

(b) Fill in the blanks of the following table which are marked with ? (L – 2, CO – 4)

Age	l_x	d_x	q_x	p_x	L_x	e_x^o
20	693435	?	?	?	?	35081126
21	690673	-	-	-	-	?

11. (a) Explain the construction of mean and range charts(L – 2, CO – 2)

OR

(b) Explain the statistical basis of SQC(L – 2, CO – 2)

12. (a) Explain the construction of fraction defective chart(L – 2, CO – 3)

OR

(b) Explain the construction of number of defects per unit chart(L – 2, CO – 3)

13. (a) Letter grades A,B,C,D and E are assigned by two teachers X and Y to the students of class for Honesty. The table gives the distribution of the proportion of individuals in each rating

(L – 5, CO – 5)

Teacher	A	B	C	D	E
X	0.10	0.15	0.50	0.20	0.05
y	0.20	0.40	0.20	0.10	0.10

OR

(b) Define reliability and validity tests.(L – 2, CO – 5)

P.B. SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada – 520 010

Autonomous -ISO 9001 – 2015 Certified

Title of the Course: Sampling Techniques and Design of Experiments

Offered to: BA(EMS) & B.SC (MSCs, M.S.Ca &M.S.Ds) **Course Code: STAT 41B**

Course Type: Core (Theory) **Credits: 4**

Year of Introduction: 2021-22 **Semester: IV**

Hours Taught: 60periods. **Max.Time:** 3 Hours

Course Prerequisites: Basic Knowledge of Mathematics, Counting principles, distributions, Estimation and Testing of Hypothesis.

Course Description: This course helps the students to understand the various sampling ideas to conduct the socio economics studies. Introduces the basic concepts and principles of experimental design

Course Objectives:

1) To impart basic concepts in Sampling Theory.
2) To explore various sampling techniques and understand their merits and drawbacks.
3) To understand the basic terminology in experimental design.
4) To develop the students ability to plan an experiment.
5) Obtaining relevant information from the experiment in relation to the statistical hypothesis under study.

Learning Outcomes: At the end of the course, the student will

1) Acumen to apply for collecting data for various studies.
2) ability to understand the design for comparing the various fields.
3) develop the skill of identifying important inputs that impact the output.

Course Outcomes:		
Course Outcome	Upon successful completion of this course, students should have the knowledge and skills to:	**Programme Outcomes Mapping**
CO 1	To understand the principles and principal steps of sampling, and different sampling techniques. Apply different sampling techniques to take samples and computeunbiased estimates and confidence limits of population parameters.	PO - 5
CO 2	To analyse the unbiasedness and efficiencies of estimates obtained using different sampling techniques.	PO - 6
CO3	To understand the basic concepts and principles of experimental designs.	PO - 5

CO 4	To Analyze the various design of experiment concepts and missing plot techniques.	PO - 6
CO 5	To Identify the factors and variable for the experiment for building statistical model.	PO - 7

CO-PO MATRIX								
COURSE CODE	**CO-PO**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
	CO1					**H**		
	CO2						**M**	
	CO3					**H**		
	CO4						**H**	
STAT41B	**CO5**							**L**

Syllabus

Unit	Learning Units	Lecture Hours
I	**Introductory Concepts of sampling :** Concepts of Population and Sample, Basic principles of sample survey, The principles steps in a sample survey, Complete enumeration Vs Sampling, Sampling and non-sampling errors, Limitations of sampling, Types of sampling, Non Probability sampling methods, Probability sampling methods **Simple Random sampling:** SRSWR definition and procedure of selecting a sample, SRSWOR definition and procedure of selecting a sample , expectation of sample mean and variance of sample mean in srswor and srswr, advantages and disadvantages.	**12**
II	**Stratified random sampling:** Stratified random sampling, Advantages and Disadvantages Allocation and types of allocation. Estimation of population mean, and its variance. Comparison between proportional and optimum allocations with SRSWOR. **Systematic sampling:** Procedure of construction, types, merits and demerits of systematic sampling. Comparison of systematic sampling with Stratified and SRSWOR	**12**
III	**Analysis of variance :** Analysis of variance(ANOVA) –Definition and assumptions. One-way classification, Two way classification.(one observation per cell) **Design of Experiments:** Terminology, Principles of design of experiments, CRD: Layout, advantages and disadvantage and Statistical analysis of Completely Randomized Design(C.R.D)	**12**

IV	Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) with their layouts, advantages and disadvantage and Statistical analysis, Missing plot technique in RBD and LSD. Efficiency RBD over CRD, Efficiency of LSD over RBDand CRD.	**12**
V	**Factorial experiments** – Main effects and interaction effects of 2^2 and 2^3 factorial experiments and their Statistical analysis. Yates procedure to find factorial effecttotals.	**12**

Text Book:

Fundamentals of Applied Statistics, 11th Edition, 2010, S. C. Gupta and V. K. Kapoor, Sultan Chand & Sons, New Delhi

Reference Books:

1. B.A/B.Sc. Second Year Statistics(2010) , Telugu Akademi, Hyderabad.
2. Mathematical Statistics with Applications, 2009, K.M.Ramachandran and Chris P.Tsokos Academic Press(Elsevier), Haryana .
3. Probability and Statistics, Volume I & II, D. Biswas, New central book Agency (P) Ltd, NewDelhi.
4. An outline of Statistical theory, Volume II,3rd Edition,2010(with corrections) A.M.Goon,M.K. Gupta, B.Dasgupta ,The World Press Pvt.Ltd., Kolakota.
5. Sanjay Arora and Bansi Lal:. New Mathematical Statistics, Satya Prakashan , New Delhi.

Websites of Interest: **http://onlinestatbook.com/rvls/index.html**

Co-Curricular Activities in the class:

1. Pictionary
2. Case Studies on topics in field of statistics
3. Snap test and Open Book test
4. Architectural – To be build the procedures
5. Extempore – Random concept to students
6. Interactive Sessions
7. Teaching through real world examples

***

Model Question Paper

Max.: 75 Marks **Course Code: STAT 41B** **Min.Pass : 30 Marks**

Model Paper

Section A

Answer any FIVE of the following. **5 x 5M = 25M**

1. Write a short note on ANOVA (CO-3,L-2)
2. Define the terms (i) Treatments (ii) Blocks (iii) Experimental error (CO-3,L-1)
3. Write the applications of Completely randomized design (CO-3,L-2)
4. Explain the layout of Latin square design (CO-4,L-2)
5. Explain the layout of Randomized block design (CO-4,L-2)
6. Write the advantages of simple random sampling (CO-1,L-2)
7. Explain the construction of stratified random sampling (CO-2,L-2)
8. Explain the advantages of systematic sampling (CO-2,L-2)

Section – B

Answer the following. **5 x 10M =50M**

9 a) Explain basic principles of sampling (CO-1,L-2)

(OR)

b) In SRSWOR, the sample mean square is an unbiased estimate of the population mean square (CO-1,L-2)

10 a) Show that $V(\overline{y_{st}})_{Ney} \leq V(\overline{y_{st}})_{P} \leq V(\overline{y_{n}})_{R}$ (CO-2,L-2)

(OR)

b) If the population consists of a linear trend then Show that (CO-2,L-2)

$V(\overline{y_{st}}) \leq V(\overline{y_{sys}}) \leq V(\overline{y_{n}})_{R}$

11 a) Explain the principles of design of experiments (CO-3,L-2)

OR

b) Explain analysis of Completely randomized design (CO-3,L-2)

12 a) Explain analysis of Randomized block design (CO-4,L-2)

(OR)

b) Explain analysis of Latin square design (CO-4,L-2)

13 a) Explain analysis of 2^2 – factorial design (CO-5,L-2)

OR

b) Explain analysis of 2^3 – factorial design (CO-5,L-2)

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CBCS CURRICULAR FRAMEWORK (2022-23)

TABLE 1 : B.Sc.(Ca.M.S) Programme SEMESTER - I 2022-23

S.NO	Name of the Course	Course Code	Part No	Type of the Paper	Total Marks	IA TEST	Sem End Exam	Teaching Hours	Credits
1	ENGLISH PRAXIS-I	22ENGT11	I	First Language	100	30	70	4	3
2	TELUGU-I	22TELT11	I	Second Language	100	30	70	4	3
3	HINDI-I	22HINT11							
4	DIFFERENTIAL EQUATIONS	22MATT11	III	Core	100	30	70	6	5
5	DESCRIPTIVE STATISTICS AND THEORY OF PROBABILITY	22STAT11	III	Core	100	30	70	4	4
6	PROBLEM SOLVING IN C	22CSCT11	II	Core	100	30	70	4	4
7	DESCRIPTIVE STATISTICS LAB	22STAL11	II	Core Lab	50	15	35	2	1
8	PROBLEM SOLVING IN C LAB	22CSCL11	II	Core Lab	50	15	35	2	1
9	PERSONALITY ENHANCEMENT AND LEADERSHIP	22LSCT11	II	Life Skill	50	15	35	2	2
		TOTAL(Maximum)			650	195	455	28	23

TABLE 2 : B.Sc.(Ca.M.S) Programme SEMESTER - II 2022-23

S.NO	Name of the Course	Course Code	Part No	Type of the Paper	Total Marks	IA TEST	Sem End Exam	Teaching Hours	Credits
1	ENGLISH PRAXIS-II	22ENGT21	I	First Language	100	30	70	4	3
2	TELUGU-II	22TELT21	I	Second Language	100	30	70	4	3
3	HINDI-II	22HINT21							
4	REAL ANALYSIS	22MATT21	II	Core	100	30	70	6	5
5	PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS	22STAT21	II	Core	100	30	70	4	4
6	DATA STRUCTURES	22CSCT21	II	Core	100	30	70	4	4
7	PROBABILITY DISTRIBUTIONS AND STATISTICAL METHODS LAB	22STAL21	II	Core Lab	50	15	35	2	1
8	DATA STRUCTURES LAB	22CSCL21	II	Core Lab	50	15	35	2	1
9	COMMUNITY SERVICE PROJECT	22CAIP2	II	CSP	100	100	0	0	4
10	ENVIRONMENTAL STUDIES	22LSCT01	III	Life Skill	50	15	35	2	1
11	DIGITAL MARKETING	22CSCSDT02	III	Skill Development	50	15	35	2	2
		TOTAL(Maximum)			800	310	490	30	28

CBCS CURRICULAR FRAMEWORK (2022-23)

TABLE 3 : B.Sc.(Ca.M.S) Programme SEMESTER -III 2022-23

S.NO	Name of the Course	Course Code	Part No	Type of the Paper	Total Marks	IA TEST	Sem End Exam	Teaching Hours	Credits
1	HINDI-III	22HINT01	I	Second Language	100	30	70	4	3
2	TELUGU-III	22TELT01	I						
3	ABSTRACT ALGEBRA	22MATT31	II	Core	100	30	70	2	2
4	SOLID GEOMETRY	22MATT01	II	Core	100	30	70	6	5
5	STATISTICAL INFERENCE	22STAT31	II	Core	100	30	70	4	4
6	DATABASE MANAGEMENT SYSTEMS	22CSCT34	II	Core	100	30	70	4	4
7	OBJECT ORIENTED PROGRAMMING USING JAVA	22CSCT01	II	Core	100	30	70	4	4
8	STATISTICAL INFERENCE LAB	22STAL31	II	Core Lab	50	15	35	2	1
9	DATABASE MANAGEMENT SYSTEMS LAB	22CSCL33	II	Core Lab	50	15	35	2	1
10	OBJECT ORIENTED PROGRAMMING USING JAVA LAB	22CSCL01	II	Core Lab	50	15	35	2	1
11	CYBER SECURITY ESSENTIALS	22CSCSDT05	II	Skill Development	50	15	35	2	1
12	YOGA	22CEXP01	IV	Extension Activity	50	15	35	2	2
		TOTAL(Maximum)			850	255	595	34	28

TABLE 4 : B.Sc.(Ca.M.S) Programme SEMESTER - IV 2022-23

S.NO	Name of the Course	Course Code	Part No	Type of the Paper	Total Marks	IA TEST	Sem End Exam	Teaching Hours	Credits
1	English Praxis-III	22ENGT01	I	First Language	100	30	70	4	3
2	Linear Algebra	22MATT41	II	Core	100	30	70	6	5
3	Sampling Techniques and Design of Experiments	22STAT41	II	Core	100	30	70	4	4
4	Sampling Techniques and Design of Experiments Lab	22STAL41	II	Core Lab	50	15	35	2	1
5	Applied Statistics	22STAT01	II	Core	100	30	70	4	4
6	Applied Statistics Lab	22STAL01	II	Core Lab	50	15	35	2	1
7	Operating Systems	22CSCT41	II	Core	100	30	70	4	4
8	Operating Systems Lab	22CSCL41	II	Core Lab	50	15	35	2	1
9	Internship	22CAIP4	II	IHP	100	100	0		4

CBCS CURRICULAR FRAMEWORK (2022-23)									
10	Quantitative Aptitude	22LSCT14	III	Life Skill	50	15	35	2	2
11	Reasoning	22LSCT15	III	Life Skill	50	15	35	2	2
12	Communication Skills for Employability-I	22ENGSDT04	III	Skill Development	50	15	35	2	2
13	Communication Skills for Employability-II	22ENGSDT05	III	Skill Development	50	15	35	2	2
14	NCC/NSS/Sports/Extra Curricular	22CEXT02	IV	Extension Activity	50	15	35	2	2
		TOTAL(Maximum)			1000	370	630	38	37

TABLE 5: B.Sc.(Ca.M.S) Programme SEMESTER - V 2022-23

S.NO	Name of the Course	Course Code	Part No	Type of the Paper	Total Marks	Internal Assessment	External Assessment Component	Monitoring Hours	Credits
1	Internship in Statistics	**22STAIAP6**	II	Core Project	200	60	140	6	12
2	Internship in Computer Science	**22CSCIAP6**							

TABLE 6: B.Sc.(Ca.M.S) Programme : SEMESTER - VI 2022-23

S.NO	Name of the Course	Course Code	Part No	Type of the Paper	Total Marks	IA TEST	Sem End Exam	Teaching Hours	Credits
1	Numerical Methods	22MATSET01	II	CORE	100	30	70	5	5
2	Mathematical Special functions	22MATSET02	II	CORE	100	30	70	5	5
3	Multiple Integrals and Applications of Vector Calculus	22MATSET03	II	CORE	100	30	70	5	5
4	Integral Transforms With Applications	22MATSET04	II	CORE	100	30	70	5	5
5	Partial Differential Equations and Fourier Series	22MATSET05	II	CORE	100	30	70	5	5
6	Number Theory	22MATSET06	II	CORE	100	30	70	5	5
7	Operations Research-I	22STASET01	II	CORE	100	30	70	3	3
8	Statistical Data Analysis using SPSS and OR-I	22STASEP01	II	CORE LAB	50	15	35	3	2

CBCS CURRICULAR FRAMEWORK (2022-23)									
9	Operations Research-II	22STASET02	II	CORE	100	30	70	3	3
10	Statistical Data Analysis using SPSS and OR-II	22STASEP02	II	CORE LAB	50	15	35	3	2
11	Regression Analysis	22STASET03	II	CORE	100	30	70	3	3
12	Data Analysis using SPSS	22STASEP03	II	CORE LAB	50	15	35	3	2
13	Multivariate Techniques	22STASET04	II	CORE	100	30	70	3	3
14	Multivariate Data Analysis Using 'R'	22STASEP04	II	CORE LAB	50	15	35	3	2
15	SQC & Reliability	22STASET05	II	CORE	100	30	70	3	3
16	SQC & Reliability Lab	22STASEP05	II	CORE LAB	50	15	35	3	2
17	Computational Techniques and R Programming	22STASET06	II	CORE	100	30	70	3	3
18	Computational Techniques Using Excel & R	22STASEP06	II	CORE LAB	50	15	35	3	2
19	Big data Analytics using R	22CASSET01	II	CORE	100	30	70	3	3
20	Big data Analytics using R Lab	22CASSEP02	II	CORE LAB	50	15	35	3	2
21	Data Science using Python	22CASSET02	II	CORE	100	30	70	3	3
22	Data Science using Python Lab	22CASSEP03	II	CORE LAB	50	15	35	3	2
23	Mobile application Development	22CASSET03	II	CORE	100	30	70	3	3
24	Mobile application Development Lab	22CASSEP04	II	CORE LAB	50	15	35	3	2
25	Cyber Security and Malware Analysis	22CASSET04	II	CORE	100	30	70	3	3
26	Cyber Security and Malware Analysis Lab	22CASSEP05	II	CORE LAB	50	15	35	3	2
27	Multimedia Tools and Applications	22CASSET05	II	CORE	100	30	70	3	3
28	Multimedia Tools and Applications Lab	22CASSEP06	II	CORE LAB	50	15	35	3	2
29	Digital Imaging	22CASSET06	II	CORE	100	30	70	3	3
30	Digital Imaging Lab	22CASSEP07	II	CORE LAB	50	15	35	3	2
		TOTAL(Maximum)			**800**	**240**	**560**	**34**	**30**