

W.e.f. 2019-20 onwards

CBCS COURSE STRUCTURE, NIZAM COLLEGE, OU, HYDERABAD, TELANGANA STATE

	CODE	COURSE TITLE	HPW	CREDITS	EXAM HOURS	MARKS
SEMESTER-I						
1	ELS-1	English (First Language)	4	4	2 hours	80C+15-I+5A
2	SLS-1	Second Language	4	4	2 hours	80C+15-I+5A
3	AEC-1	Environmental Science /Human values and Ethics	2	2	1½ hours	40C+10-I
4	DSC-101	Differential Equations	5+2(5)	5	3 hours	80C+15I+5A
5	DSC-102	Optional-2	4+3 (5)	4+1 (5)	3 hours	80C+15I+5A
6	DSC-103	Optional-3	4+3 (5)	4+1 (5)	3 hours	80C+15I+5A
	Total		28/25	25		550/700
SEMESTER-II						
7	ELS-2	English (First Language)	4	4	2 hours	80C+15-I+5A
8	SLS-2	Second Language	4	4	2 hours	80C+15-I+5A
9	AEC-2	Environmental Science/ Human values and Ethics	2	2	1½ hours	40C+10-I
10	DSC-201	Differential & Integral Calculus	5+2(5)	5	3 hours	80C+15-I+5A
11	DSC-202	Optional-2	4+2 (5)	4+1 (5)	3 hours	80C+15-I+5A(50P)
12	DSC-203	Optional-3	4+2 (5)	4+1 (5)	3 hours	80C+15-I+5A(50P)
	TOTAL		28/25	25		550/700
SEMESTER-III						
13	ELS-3	English (First Language)	3	3	2 hours	80C+15-I+5A
14	SLS-3	Second Language	3	3	2 hours	80C+15-I+5A
15	SEC-1		2	2	1½ hour	40C+10-I
16	SEC-2	Theory of equations	2	2	1½ hour	40C+10-I
17	DSC-301	Real Analysis	5+2(5)	5	3 hours	80C+15-I+5A
18	DSC-302	Optional-2	4+2 (5)	4+1 (5)	3 hours	80C+15-I+5A(50P)
19	DSC-303	Optional-3	4+2 (5)	4+1 (5)	3 hours	80C+15-I+5A(50P)
	Total		28/25	25		600/750
SEMESTER-IV						
20	ELS-4	English (First Language)	3	3	2 hours	80C+15-I+5A
21	SLS-4	Second Language	3	3	2 hours	80C+15-I+5A
22	SEC-3		2	2	1½ hour	40C+10-I
23	SEC-4	Vector Calculus	2	2	1½ hour	40C+10-I
24	DSC-401	Abstract Algebra	5+2(5)	5	3 hours	80C+15-I+5A

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25	DSC-402	Optional-2	4+2 (5)	4+1 (5)	3 hours	80C+15-I+5A(50P)
26	DSC-403	Optional-3	4+2 (5)	4+1 (5)	3 hours	80C+15-I+5A(50P)
		TOTAL	28/25	25		600/750

**SEMEST
ER-V**

27	ELS-5	English(First Language)	3	3	2 hours	80C+15-I+5A	
28	SLS-5	Second Language	3	3	2 hours	80C+15-I+5A	
29	GE	Basic Mathematics or Mathematics for Economics & Finance	4	4	3 hours	80C+15-I+5 A	
30	DSE - 501	A	5+2(5)	5	3 hours	80C+15-I+5A	
		B					Linear Algebra
		C					Linear Algebra
31	DSE - 502	A	4+2 (5)	5	3 hours	80C+15-I+5A(50P)	
		B					
		C					
32	DSE - 503	A	4+2 (5)	5	3 hours	80C+15-I+5A(50P)	
		B					
		C					
		Total	28/25	25		600/750	

**SEMEST
ER-VI**

33	ELS-6	English (First Language)	3	3	2 hours	80C+15-I+5A	
34	SLS-6	Second Language	3	3	2 hours	80C+15-I+5A	
35	PR	Project Report / Optional paper	4	4	1½ HOUR/ 3 HOURS	PR-75+15VV +10presentation 80C+15-I+5A	
36	DSE - 601	A	5+2(5)	5	3 hours	80C+15-I+5Ap	
		B					Integral Transforms
		C					Analytical Solid Geometry
37	DSE - 602	A	4+2 (5)	5	3 hours	80C+15-I+5A(50P)	
		B					
		C					
38	DSE - 603	A	4+2 (5)	5	3 hours	80C+15-I+5A(50P)	
		B					
		C					
		TOTAL	28/25	25		600/750	
		GRAND TOTAL	168/150			3,500/4,400	

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HEAD
 Department of Mathematics
 NIZAM COLLEGE, O U Hyd.

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 B.S. in Mathematics
 Department of Mathematics
 Osmania University
 Hyd-500 007.

Handwritten signature
Head
 Department of Mathematics
 Osmania University
 Hyd-500 007.

Credits under Non-CGPA	NSS/NCC/SPORTS/ EXTRA CURICULAR/ STUDENT CLUBS	6	UP TO 6 (2 IN EACH YEAR)
	SUMMER INTERNSHI P	4	UP TO 4 (2 IN EACH AFTER 1&2 YEARS)
	T+P		Tutorial Problem Solving + Presentation by student

ELS: English Language Skill; SLS: Second Language Skill; AEC: Ability Enhancement Compulsory Course; SEC: Skill Enhancement Course; DSC: Discipline Specific Course; DSE: Discipline Specific Elective; GE: Generic Elective; T: Theory; P: Practical; I: Internal Exam C: College Exam: PR: Project Report; VV: Viva- Voce Examination

Note: I) If a student should opt for "a" in SEC in III semester, the student has to opt for "a" only in IV semester and so is the case with "b" and "c". In the case of DSE also the rule applies.

II) Project work should be done by individual student or a group of 4 students.

S.NO	COURSE CATEGORY	NO OF COURSES	OF CREDITS PE R COURSE	TOTAL CREDITS
1	English language	6	4/3	20
2	Second language	6	4/3	20
3	AECC	2	2	4
4	SEC	4	2	8
5	GE	4	4	4
6	PROJECT	4	4	4
7	DSC	12	5	60
8	DSE	6	5	30
	TOTAL	38		150

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Chairperson
BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.

[Signature]
Head
Department of Mathematics
Osmania University
Hyderabad-500 007.

[Signature]
HEAD
Department of Mathematics
NIZAM COLLEGE, O U Hyd.


[Signature]

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MINUTES OF THE BOARD OF STUDIES MEETING HELD ON 30.06.2021 IN THE DEPARTMENT OF MATHEMATICS, NIZAM COLLEGE (A), BASHEERBAGH, HYDERABAD.

The following members are attended the Board of Studies meeting of Department of Mathematics, Nizam College (A), Osmania University, Basheerbagh, Hyderabad.

1. Prof. B. Surender Reddy
Chairperson, Board of Studies Mathematics
Department of Mathematics
University College of Science
Osmania University, Hyderabad


Head
Department of Mathematics
Osmania University
Hyderabad-500 007.

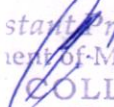
2. Prof. B. Surender Reddy
Head, Department of Mathematics
University College of Science
Osmania University, Hyderabad


Chairperson
BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.


3. Dr. S. Renuka
Assistant Professor
I/C Head, Department of Mathematics
Nizam College(A), Osmania University
Basheerbagh, Hyderabad


HEAD
Department of Mathematics
NIZAM COLLEGE, O U Hyd.

4. Dr. G. Upender Reddy
Assistant Professor
Department of Mathematics
Nizam College(A), Osmania University
Basheerbagh, Hyderabad


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

5. Dr. Ch. Kishore Kumar
Assistant Professor
Department of Mathematics
Nizam College(A), Osmania University
Basheerbagh, Hyderabad


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

Agenda:


1. To approve the revised syllabus of B. Sc., V & VI Semesters.
(B. Sc., III, Year) according to CBCS (TSCHE) Syllabus
2. Any other item with the permission of the chairperson.

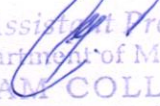
Resolutions:

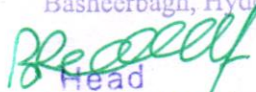
1. Approved the revised syllabus for B. Sc., V & VI, - Semesters

Resolutions:


1. It is unanimously resolved to approve the proposed syllabus for core courses of B.Sc., V, VI Semesters (As per the approved syllabus of TSCHE)
2. It is resolved to Appoint Examiners from other Autonomous Institutions and Government Colleges keeping in View their Experience and Academic Back ground.
3. It is resolved to empower the Chairperson of the Department of Autonomous College to Appoint Panel of Examiners.
4. It is resolved to approve Scheme of Evaluation proposed by the Department in total.

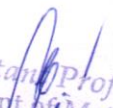

Chairperson
BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.


Head
Department of Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.


HEAD
Department of Mathematics
NIZAM COLLEGE, O.U. Hyd.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

SEMESTER-V.

1.5 Linear Algebra

(w.e.f. academic year 2021-22)

DSC-E

BS:501

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: The students are exposed to various concepts like vector spaces , bases , dimension, Eigen values etc.

Outcome: After completion this course students appreciate its interdisciplinary nature.

Unit- I

Vector Spaces: Vector Spaces and Subspaces -Null Spaces, Column Spaces, and Linear Transformations -Linearly Independent Sets; Bases -Coordinate Systems -The Dimension of a Vector Space

Unit- II

Rank-Change of Basis - Eigenvalues and Eigenvectors - The Characteristic Equation

Unit- III

Diagonalization -Eigenvectors and Linear Transformations -Complex Eigenvalues - Applications to Differential Equations.

Unit- IV


Orthogonality and Least Squares : Inner Product, Length, and Orthogonality -Orthogonal Sets -Orthogonal Projections - The Gram-Schmidt Process.

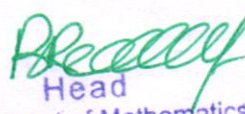
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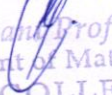
- David C Lay, *Linear Algebra and its Applications 4e*


References:


- S Lang, *Introduction to Linear Algebra*
- Gilbert Strang , *Linear Algebra and its Applications*
- Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence; *Linear Algebra*
- Kuldeep Singh; *Linear Algebra*
- Sheldon Axler; *Linear Algebra Done Right*


Chairperson
BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.


Head
Department of Mathematics
Osmania University
Hyderabad-500 007.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.


HEAD
Department of M. them.
NIZAM COLLEGE, O U Hyd.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001

1.14 Mathematics for Economics and Finance

Generic Elective - V(B)

BS:502(B)

Theory: 4 credits and Tutorials: 0 credits
Theory: 4 hours /week and Tutorials: 1 hours /week

Objective: Many models and problems in modern economics and finance can be expressed using the language of mathematics and analysed using mathematical techniques. The aim is to show how a range of important mathematical techniques work and how they can be used to explore and understand the structure of economic models.

Outcome: Student were chiefly interested in learning the mathematics that had applications to economics and finance. Students gain a familiarity with economics and finance principles and are confident in applying them.

Unit- I

Linear Equations: Introduction - Solution of Linear Equations - Solutions of Simultaneous Linear Equations - Graphs of Linear Equations - Budget Lines - Supply and Demand Analysis .

Quadratic Equations: Introduction - Graphs of Quadratic Functions - Quadratic Equations - Applications to Economics.

Unit- II

Functions of a Single Variable: Introduction - Limits - Polynomial Functions - Reciprocal Functions - Inverse Functions. **The Exponential and Logarithmic Functions:** Introduction - Exponential Functions - Logarithmic Functions - Returns to Scale of Production Functions - Compounding of Interest.

Unit- III


Matrices and Determinants: Introduction - Matrix Operations - Solutions of Linear Systems of Equations - Cramer' s Rule - More Determinants - Special Cases.


Unit-IV

Linear Difference Equations: Introduction - Difference Equations - First Order Linear Difference Equations.

Text:


- Vassilis. C. Mavron and Timothy N.Phillips, *Elements of Mathematics for Economics and Finance*; Springer Publishers.


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BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.


Head
Department of Mathematics
Osmania University
Hyderabad-500 007.

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Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

1.6 Numerical Analysis
(w.e.f. academic year 2021-22)

Theory: 5 credits and Tutorials: 0 credits Theory: 5 hours /week and Tutorials: 1 hours /week

DSE-1F/A

BS:601/A

Theory: 5 credits and Tutorials: 0 credits Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students will be made to understand some methods of numerical analysis.

Outcome: Students realize the importance of the subject in solving some problems of algebra and calculus.

Unit- I

Errors in Numerical Calculations - **Solutions of Equations in One Variable:** The Bisection Method - The Iteration Method - The Method of False Position-Newton's Method - Muller's Method - solution of Systems of Nonlinear Equations.

Unit- II

Interpolation and Polynomial Approximation: Interpolation - Finite Differences - Differences of Polynomials - Newton's formula for Interpolation - Gauss's central differences formulae - Stirling's and Bessel's formula - Lagrange's Interpolation Polynomial - Divided Differences - Newton's General Interpolation formula - Inverse Interpolation.

Unit- III

Curve Fitting: Least Square Curve Fitting: Fitting a Straight Line-Nonlinear Curve Fitting.
Numerical Differentiation and Integration: Numerical Differentiation - Numerical Integration: Trapezoidal Rule-Simpson's 1/3rd-Rule and Simpson's 3/8th-Rule - Boole's and Weddle's Rule - Newton's Cotes Integration Formulae.

Unit- IV

Numerical Solutions of Ordinary Differential Equations: Taylor's Series Method - Picard's Method - Euler's Methods - Runge Kutta Methods.

Text:

- S.S.Sastry, *Introductory Methods of Numerical Analysis*, PHI

References:

- Richard L. Burden and J. Douglas Faires, *Numerical Analysis (9e)*
- M K Jain, S R K Iyengar and R K Jain, *Numerical Methods for Scientific and Engineering computation*
- B.Bradie , *A Friendly introduction to Numerical Analysis*



Prasanna
Chairperson
BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.

Prasanna
Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Hyderabad-500 001.

Prasanna
Department of Mathematics
NIZAM COLLEGE, O U Hvd.

Prasanna
Head
Department of Mathematics
Osmania University
Hyderabad-500 007.

Prasanna
Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Hyderabad-500 007.

1.7 Integral Transforms

(w.e.f. academic year 2021-22)

DSE - 1F/B

BS:601/B

Theory: 5 credits and Tutorials: 0 credits Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students will be exposed to Integral Transforms. The students also learning the Applications of Laplace Transforms to Differential Equations which arises in Physics and Engineering Problems.

Outcome: Students apply their knowledge to solve some problems on special functions and Differential Equations by using the Integral Transforms.

Unit- I

Laplace Transforms-Definition-Existence theorem-Laplace transforms of derivatives and integrals

– Periodic functions and some special functions.

Unit- II

Inverse Transformations - Convolution theorem - Heaviside's expansion formula.

Unit- III

Applications to ordinary differential equations - solutions of simultaneous ordinary differential equations - Applications to Partial differential equations.

Unit- IV

Fourier Transforms- Sine and cosine transforms-Inverse Fourier Transforms.

Text:

• Vasishtha and Gupta, *Integral Transforms*, Krishna Prakashan Media(P), Ltd, Meerut (2e)



Prasanna
Chairperson
BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.

Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

Prasanna
HEAD
Department of Mathematics
NIZAM COLLEGE, O U Hyd.

Prasanna
Head
Department of Mathematics
Osmania University
Hyderabad-500 007.

Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

1.8 Analytical Solid Geometry

(w.e.f. academic year 2021-22)

DSE - 1F/C

BS:601/C

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: Students learn to describe some of the surfaces by using analytical geometry.

Outcome: Students understand the beautiful interplay between algebra and geometry.

Unit- I

Sphere: Definition-The Sphere Through Four Given Points-Equations of a Circle- Intersection of a Sphere and a Line-Equation of a Tangent Plane-Angle of Intersection of Two Spheres-Radical Plane.

Unit- II

Cones and Cylinders: Definition-Condition that the General Equation of second degree Represents a Cone-Cone and a Plane through its Vertex -Intersection of a Line with a Cone.

Unit- III

The Right Circular Cone-The Cylinder- The Right Circular Cylinder.

Unit- IV


The Conicoid: The General Equation of the Second Degree-Intersection of Line with a Conicoid-Plane of contact-Enveloping Cone and Cylinder.

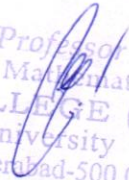
Text:

- Shanti Narayan and P K Mittal, *Analytical Solid Geometry* (17e)


References:


- Khaleel Ahmed, *Analytical Solid Geometry*
- S L Loney, *Solid Geometry*
- Smith and Minton, *Calculus*


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BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

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HEAD
Department of Mathematics
NIZAM COLLEGE, O U Hyd.


Head
Department of Mathematics
Osmania University
Hyderabad-500 007.


Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

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V-SEM. BASIC MATHEMATICS
(GENERIC ELECTIVE)

Theory: 4 credits and Tutorials: 0 credits Theory: 4 hours/week and Tutorials: 0
Hours/ week

Generic Elective-V (A)

UNIT-I

Numbers- Number, Alphabet, Alpha Numeric series, Arithmetic and Geometric Progression, -
Coding and Decoding- Letter Coding, Direct Letter Coding, Number/Symbol Coding,
Substitution, Deciphering message word code, Deciphering number and symbol code- Blood
Relations- Direction Sense-Time and Work-Trains

UNIT-II

Clocks - Calendars - Odd man out - Data Analysis (pie charts & histograms)-Data Sufficiency-
Mathematical Operations- Problem Solving by Substitution, Deriving appropriate conclusions-
Sets and Venn diagrams

UNIT-III

Coordinate Geometry: Fundamentals-Cartesian Coordinates system -Polar Coordinates-
Distance Formula-Section Formula-Centroid of a Triangle-Area of a Triangle

UNIT-IV


Matrices: Introduction-Definitions and Notations-Operations on Matrices- Determinant of a
Square Matrix-Non Singular matrix and Singular Matrix-Sarrus Diagram for Expansion of
Determinant of a matrix 3X3-Properties of

Determinants. (15.1, 15.2, 15.3, 15.5.1, 15.5.2, 15.5.3 of Chapter 15)

Text: 1. P. Mariappan, Business Mathematics, Pears on Publication 2015, New Delhi.

2. R.S. Aggarwal A modern Approach to Verbal and Nonverbal Reasoning- S Chand


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B.S in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007.


Head
Department of Mathematics
Osmania University
Hyderabad-500 007.

1.15 Mathematical Modeling

Project/ Optional - VI

BS:602

Theory: 4 credits and Tutorials: 0 credits
Theory: 4 hours /week and Tutorials: 1 hours /week

Objective: This topic aims to provide the student with some basic modelling skills that will have application to a wide variety of problems.

Outcome: The focus is on those mathematical techniques that are applicable to models involving differential equations, and which describe rates of change. Student realizes some beautiful problems can be modeled by using differential equations. The students also learn how to use the mathematical technique in solving differential equations.

Unit- I

Introduction to Mathematical Modelling: Mathematical Models-Modelling for decision making.

Compartmental Models: Exponential decay and radioactivity - Case Study: Detecting art forgeries - Lake Pollution Models - First order Linear Differential Equations - Equilibrium points and stability.

Unit- II

Models of Single Populations: Exponential growth - Density-dependent growth - Limited growth with harvesting. **Interacting Population Models:** Model for an influenza outbreak -

Case Study: Cholera - Predators and prey - Competing Species.

Unit- III

Formulating Heat and Mass Transport Models: Some basic physical laws - Model for a hot water heater- Heat conduction and Fourier's Law - Heat conduction through a wall - Radiative heat conduction - Diffusion.

Unit- IV

Boundary Value Problems - Heat loss through a wall - Insulating a water pipe - **Introduction to Partial Differential Equations:** The heat conduction equation - Oscillating soil temperatures - **Case study:** Detecting Land Mines - Lake Pollution.

Text:

- 1. B.Barnes and G.R.Fulford, *Mathematical Modelling with Case Studies* 3rd Edition, 2009, CRC press.

References:

- 1. Shepley L. Ross, "Differential Equations".
- 2. I. Sneddon, *Elements of Partial Differential Equations*
- 3. Zafar Ahsan, "Differential Equations and their Applications"



BoS in Mathematics
Department of Mathematics
Osmania University
Hyderabad-500 007

38

Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

HEAD
Department of Mathematics
NIZAM COLLEGE, O U Hyd.

Head
Department of Mathematics
Osmania University
Hyderabad-500 007.

Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.

Nizam College (Autonomous)

Model Question Paper for Internal Examination

Marks: 15

Time: 45 Min

I. Fill in the blanks (10X 1/2 = 5)

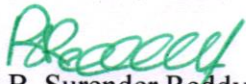
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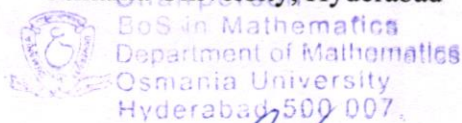
II. Multiple Choice Questions (10X 1/2 = 5)

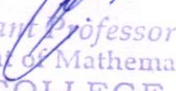
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III. Short Answer Questions (5X1=5)

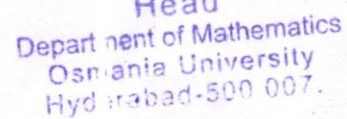
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- 4.
- 5.



Prof. B. Surender Reddy
Chairperson, Board of Studies Mathematics
Department of Mathematics
University College of Science
Osmania University, Hyderabad

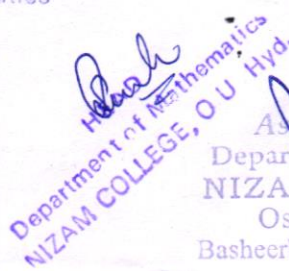



Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.


Prof. B. Surender Reddy
Head, Department of Mathematics
Department of Mathematics
University College of Science
Osmania University, Hyderabad




Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 001.



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Model Theory Question Paper (V, VI- Sem.)

Subject:
Duration of the Examination: 3 hrs

Paper:
Maximum Marks: 80

Section – A (4 X 6=24 Marks)
(Short Answer question)

1. UNIT - I
2. UNIT - II
3. UNIT - III
4. UNIT-IV

Section – B (4 X 14 = 56 Marks)
(Essay Questions)

5. UNIT-I
(a)

(OR)

(b)

6. UNIT-II
(a)

(OR)

(b)

7. UNIT-III
(a)


(OR)

(b)

8. UNIT-IV
(a)

(OR)


(b)


Prof. B. Surender Reddy
Chairperson, Board of Studies Mathematics
Department of Mathematics
University College of Science



Assistant Professor
Department of Mathematics
NIZAM COLLEGE, (A)
Osmania University
Hyderabad-500 007 Basheerbagh, Hyderabad-500 007


HEAD
Department of Mathematics
NIZAM COLLEGE, O U Hyd.


Prof. B. Surender Reddy
Head, Department of Mathematics
Department of Mathematics
University College of Science

Head
Department of Mathematics
Osmania University
Hyderabad-500 007

Assistant Professor
Department of Mathematics
NIZAM COLLEGE (A)
Osmania University
Basheerbagh, Hyderabad-500 007