"Dissemination of Education for Knowledge, Science and Culture"

-Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha's

# VIVEKANAND COLLEGE, KOLHAPUR

# (EMPOWERED AUTONOMOUS)

## DEPARTMENT OF MATHEMATICS

### Three/Four- Years UG Programme

### Department/Subject Specific Core or Major (DSC)

### NEP- Phase-II

# Curriculum, Teaching and Evaluation Structure

### (as per NEP-2020 Guidelines)

## for

# B.Sc.-I Mathematics

# Semester-I & II

**(Implemented from academic year 2024-25 onwards)**

Vivekanand College, Kolhapur (Empowered Autonomous)

**Department of Mathematics**
**B.Sc. I**

**POs:**

- **PO1: Disciplinary Knowledge:** Graduates will gain in-depth understanding in their specific major or discipline, mastering the foundational principles and theories, as well as advanced concepts. Execute strong theoretical and practical understanding developed from the specific programme in the area of work.
- **PO2: Problem-Solving Skills:** Graduates will learn to use their knowledge to identify, analyse, and solve problems related to their field of study Students should progress their vertical mobility
- **PO3: Analytical Skills:** Graduates will gain the ability to collect, analyse, interpret, and apply data in a variety of contexts. They might also learn to use specialized software or equipment
- **PO4: Research Skills and Scientific temper:** Depending on the field, graduates might learn how to design and conduct experiments or studies, analyse results, and draw conclusions. They might also learn to review and understand academic literature.
- **PO5: Communication Skills:** Many programs emphasize the ability to communicate effectively, both orally and in writing. Graduates may learn to present complex information clearly and succinctly, write detailed reports, and collaborate effectively with others.
- **PO6: Ethics and Professionalism**: Graduates may learn about the ethical and professional standards in their field, and how to apply them in real-world situations.

**PSOs:**

- **PSO1:** Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
- **PSO2:** The skills and knowledge gained has intrinsic beauty, which also leads to proficiency in analytical reasoning. This can be utilised in modelling and solving real life problems.
- **PSO3:** Students should be able to recall basic facts about mathematics and train the students to extract information, formulate and solve problems in systematic and logical manner.
- **PSO4:** Students will learn numerical aptitude applying both qualitative and quantitative knowledge for their further career.
- **PSO5:** This programme will also help students to enhance their employability for government jobs, jobs in banking, insurance and investment sectors, data analyst jobs and jobs in various other public and private enterprises.

**VIVEKANAND COLLEGE, KOLHAPUR (EMPOWERED AUTONOMOUS)**
**Department of Mathematics**
**Teaching and Evaluation Scheme**
**Three/Four- Years UG Programme**
**Department/Subject Specific Core or Major (DSC)**
**First Year Semester-I & II**

| Sr. No. | Course Abbr. | Course code | Course Name | Teaching Scheme Hours/week | | Examination Scheme and Marks | | | | Course Credits |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH | PR | ESE | CIE | PR | Marks | |
| **Semester-I** | | | | | | | | | | |
| 1 | DSC-I | 2DSC03MAT11 | Basic Algebra | 2 | - | 40 | 10 | - | 50 | 2 |
| 2 | DSC-II | 2DSC03MAT12 | Calculus | 2 | - | 40 | 10 | - | 50 | 2 |
| 3 | OEC-I | 2OEC03MTS11 | Mathematical Science-I (Foundations of Mathematics) | - | 4 | - | - | 25 | 25 | 2 |
| 4 | DSC-PR-I | 2DSC03MAT19 | DSC Mathematics Lab-I | - | 4 | - | - | 25 | 25 | 2 |
| | **Total** | | | **4.0** | **8** | **80** | **20** | **50** | **200** | **8.0** |
| **Semester-II** | | | | | | | | | | |
| 1 | DSC-III | 2DSC03MAT21 | Differential Equations – I | 2 | - | 40 | 10 | - | 50 | 2 |
| 2 | DSC-IV | 2DSC03MAT22 | Discrete Mathematics | 2 | - | 40 | 10 | - | 50 | 2 |
| 3 | OEC-II | 2OEC03MTS21 | Mathematical Science-II (Quantitative aptitude) | - | 4 | - | - | 25 | 25 | 2 |
| 4 | DSC-PR-II | 2DSC03MAT29 | DSC Mathematics Lab-II | - | 4 | - | - | 25 | 25 | 2 |
| | **Total** | | | **4** | **8** | **80** | **20** | **50** | **150** | **8** |

# Semester -I

**B. Sc. Part – I Semester -I Mathematics**

**DSC-I: 2DSC03MAT11: Basic Algebra**

**Theory: 30 hrs.**

**Marks-50 (Credits: 02)**

**Course Outcomes (COs):**

**On completion of the course, the students will be able to:**

**CO1:** Employ De-Moivre's theorem.

**CO2:** Find rank, eigen values, eigen vectors of the matrix.

**CO3:** Solve system of linear homogeneous and non-homogeneous equations.

**CO4:** Understand Hermitian and Skew Hermitian matrices.

| UNIT | Contents | Hours Allotted |
|---|---|---|
| 1 | **ALGEBRA OF COMPLEX NUMBERS:**<br>1.1. Sums and Products, Moduli, Polar form, Geometrical representation of Complex Numbers, Exponential form, arguments of Products and Quotients.<br>1.2. De-Moivre's Theorem and examples<br>1.3 Applications of De-Moivre's Theorem<br>1.3.1 $n^{th}$ roots of unity.<br>1.3.2 Expansion of $cos\ n\theta, sin\ n\theta$<br>1.3.3 Circular functions and hyperbolic functions.<br>1.3.4 Relations between circular and hyperbolic functions.<br>1.3.5 Inverse circular and hyperbolic functions. | 15 |
| 2 | **MATRICES**<br>2.1. Introduction<br>2.2 Definitions of Hermitian and Skew Hermitian matrices.<br>2.3. Properties of Hermitian and Skew Hermitian matrices.<br>2.4. Rank of a Matrix, Row-echelon form and reduced row echelon form, normal form.<br>2.5. System of linear homogeneous and non-homogeneous equations.<br>2.5.1. Condition for consistency and examples.<br>2.5.2. Nature of the general solution and examples.<br>2.5.3. Gaussian elimination and Gauss Jordon method and examples. (Using row-echelon form and reduced row echelon form).<br>2.6. Characteristic equation, eigen values and eigen vectors of a matrix and examples<br>2.7. Cayley Hamilton theorem and examples. | 15 |

**Recommended Books:**

1. Ch.V. Ramana Murthy, N. C. Shrinivas, Applied Mathematics**,** S. Chand and Company Ltd., 1st Edition, 2001.
   Scope: Unit-I: Chapter No. 1: Art.1.2 to Art.1.13, Art. 1.15, Art. 1.17 to Art. 1.19, Art.1.23
2. H. K. Dass, Er. Rajnish Verma, Higher Engineering Mathematics, S. Chand and Company

Pvt. Ltd. 3rd Revised Edition 2014.

Scope: Unit-II: Art. 19.1 to Art. 19.3, Art. 21.1 to Art. 21.6, Art. 21.27 to Art. 21.30, Art. 20.1 to Art. 20.4

**Reference Books:**

1. Shanti Narayan (Revised by P. K. Mittal), A Text Book of Matrices, S. Chand and Co., 11th Edition, reprint 2007.
2. Howard Anton and Chris Rorres, Elementary Linear Algebra (Application Version), 10th Edition, 2010.
3. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, Mc-Graw Hill, 8th Edition, 2009.
4. A. R. Vasishtha, Modern Algebra, Krishna Prakashan, Meerut 1994.

**B. Sc. Part – I Semester -I Mathematics**

**DSC-II: 2DSC03MAT12: Calculus**

**Theory: 30 hrs.**

**Marks-50 (Credits: 02)**

**Course Outcomes (COs)**

**On completion of the course, the students will be able to:**

**CO1:** Find higher derivatives of product two differentiable functions using Leibnitz theorem.

**CO2:** Learn conceptual variations while advancing from one variable to several variables in calculus.

**CO3:** Understand the consequences of mean value theorems for differentiable functions.

**CO4:** Apply L'Hôpital rule to various indeterminate forms.

| UNIT | Contents | Hours Allotted |
|---|---|---|
| 1 | **Differentiation**<br>1.1. Successive Differentiation<br>1.1.1. Higher order derivatives: notations.<br>1.1.2. Calculation of $n^{th}$ derivative: Standard results<br>1.1.3. Determination of $n^{th}$ derivative of rational functions: Examples.<br>1.1.4. The $n^{th}$ derivative of product of the powers of sine and cosines: Examples.<br>1.1.5. Leibnitz's Theorem. The $n^{th}$ derivative of product of two functions.<br>1.1.6. Examples on Leibnitz's Theorem.<br>1.2. Partial differentiation<br>1.2.1. Introduction to functions of two and more variables<br>1.2.2. Partial derivative: first order and higher order – examples.<br>1.2.3. Geometrical interpretation of partial derivatives of first order. | 15 |
| 2 | **Mean Value Theorems and Indeterminate forms**<br>2.1. Mean Value Theorems<br>2.1.1. Rolle's Mean Value Theorem, Geometrical interpretation.<br>2.1.2. Lagrange's Mean Value Theorem, Geometrical interpretation.<br>2.1.3. Meaning of sign of derivative<br>2.1.4. Cauchy's Mean Value Theorem.<br>2.1.5. Examples on 2.1.1, 2.1.2, 2.1.3 and 2.1.4<br>2.2. Indeterminate forms<br>2.2.1. Indeterminate forms: L' Hôpital rule for $\frac{0}{0}$ and $\frac{\infty}{\infty}$ form (Statement only).<br>2.2.2. The indeterminate forms $0 \times \infty$, $\infty - \infty$, $0^0$ , $1^\infty$ , $\infty^0$<br>2.3. Expansion of functions<br>2.3.1. Maclaurin's theorem (statement only): Examples.<br>2.3.2. Taylor's theorem (statement only): Examples. | 15 |

**Recommended Books:**

1. Shanti Narayan and P.K. Mittal, Differential Calculus, S. Chand publishing, 15th edition (2016).

Scope: Unit 1 – 1.1: Chapter 5: 5.1 to 5.5 1.2: Chapter 11: 11.6, 11.6.1, 11.7.1
Unit 2 – 2.1: Chapter 8: 8.1, 8.2, 8.3, 8.5 2.2: Chapter 10: 10.1 to 10.6 2.3: Chapter 6: 6.1, 6.2

**Reference Books:**

1. Gorakh Prasad, Differential Calculus, Pothishala Pvt. Ltd., 19th edition (2016).
2. Gabriel Klambauer, Aspects of Calculus, Springer-Verlag (1986).
3. Hari Kishan, Differential Calculus, Atlantic Publishers & Dist. (2007).
4. George B. Thomas Jr., Joel Hass, Christopher Heil & Maurice D. Weir, Calculus, Pearson Education, 14th edition (2018)

**B. Sc. Part – I Semester -I Mathematics**

**OEC MTS PR – I: 2OEC03MTS11: Foundations of Mathematics**

**Theory: 30 hrs.**

**Marks-50 (Credits: 02)**

**Course Outcomes:**

**Upon successful completion of the course students will able to**:

**CO1**: Pictorial representations of operations on the set.

**CO2**: Describe sets, subsets and perform basic operations on sets

**CO3**: learn to identify, represent and recognize relations and functions from schematic descriptions, arrow diagrams and graphs.

**CO4**: Compute distance formula, midpoint formula, equation of lines, parallel lines and perpendicular lines.

**Practical:**

1. Examples on Venn Diagram and operations on sets
2. Examples on Cartesian Product of sets
3. Examples on Types of relations
4. Examples on Equivalence Relation
5. Examples on Equivalence Class
6. Examples on Functions and their types
7. Examples on Midpoint, Distance, Section formula
8. Examples on Standard graphs on GeoGebra in Cartesian Coordinate system
9. Examples on Standard graphs on GeoGebra in Polar Coordinate system
10. Examples on Absolute Value

**Recommended Books:**

1. Lipschutz, Seymour. (Second Edition). Set Theory and Related Topics. Schaum's Series. McGraw-Hill. New York.

2. Elliott Mendelson, Schaum's Outline of Theory and problems of "Beginning Calculus" Second edition, Tata McGraw-Hill publishing company limited.

**Reference Books:**

1. Gary Chartrand, Albert D. Polimeni and Ping Zhang, Mathematical Proofs A Transition to Advanced Mathematics, 3rd Edition, Pearson

2. Ian Stewart and David Tall, The Foundations of Mathematics, 2nd Edition, Oxford

3. Elliott Mendelson, Number Systems and the Foundations of Analysis (Dover Books on Mathematics)

4. Kamke, E. Theory of Sets. Dover Publishers.

5. George B. Thomas, Jr. And Ross L. Finney Calculus and Analytical Geometry (Pearson)

**B. Sc. Part – I Semester -I Mathematics**

**DSC-PR-I: 2DSC03MAT19 : DSC MATHEMATICS LAB – I**

**Practical Four Lectures of 60 minutes per week per batch**

**Marks-50 (Credits: 02)**

**Course Outcomes (COs)**

**On completion of the course, the students will be able to:**

**CO1:** Employ applications of De-Moivre's Theorem.

**CO2:** Find rank, eigen values, eigen vectors of the matrix.

**CO3:** Understand the consequences of mean value theorems for differentiable functions.

**CO4:** Apply L'Hôpital rule to various indeterminate forms.

| **Practical** |
|---|
| 1. Examples on De-Moivre's Theorem. |
| 2. Examples on $n^{th}$ roots of unity |
| 3. Expansion on $\cos n\theta$ , $\sin n\theta$ |
| 4. Solution of system of linear homogeneous equations. |
| 5. Solution of system of linear non-homogeneous equations. |
| 6. Eigen values and Eigen vectors of matrix |
| 7. Cayley-Hamilton Theorem (Verification and finding inverse of matrix) |
| 8. Examples of $n^{th}$ derivative |
| 9. Examples on Leibnitz's Theorem. |
| 10. Examples on partial differentiation |
| 11. Examples on Lagrange's Mean Value Theorem |
| 12. Examples on Cauchy's Mean Value Theorems. |
| 13. Examples on L' Hospital's rule for $0 \times \infty \; and \; \infty - \infty$ form |
| 14. Examples on L' Hospital's rule for $0^0 \; and \; 1^\infty, \infty^0$ form |
| 15. Examples on expansion of functions |

**Recommended Books: -**


1. Ch.V. Ramana Murthy, N. C. Shrinivas, Applied Mathematics**,** S. Chand and Company Ltd., 1st Edition, 2001.
2. H. K. Dass, Er. Rajnish Verma, Higher Engineering Mathematics, S. Chand and Company Pvt. Ltd. 3rd Revised Edition 2014.
3. Brown and Churchill, Complex Variables and Applications, 7th Edition, McGraw Hill, 2010.

# Semester -II

**B. Sc. Part – I Semester -II Mathematics**

**DSC-III: 2DSC03MAT21: Differential Equations - I**

**Theory: 30 hrs.**

**Marks-50 (Credits: 02)**

**Course Outcomes (COs)**

**On completion of the course, the students will be able to:**

**CO1:** Learn various techniques of getting exact solutions of solvable first order differential equations and linear differential equations

**CO2:** Calculate P.I and C.F. of different types of differential equation

**CO3:** Solve differential equation of degree more than one.

**CO4:** Learn applications of differential equations.

| UNIT | Contents | Hours Allotted |
|---|---|---|
| 1 | **Ordinary differential equations of first order and first degree:**<br>1.1 Introduction.<br>1.2 Exact differential equations.<br>1.2.1 Necessary and sufficient condition for exactness.<br>1.2.2 Differential equations reducible to exact, integrating factors with rules.<br>1.3 Linear differential equations.<br>1.4 Differential equations reducible to linear.<br>1.5 Applications of differential equations of first order and first degree:<br>1.5.1 Law of growth.<br>1.5.2 Law of decay.<br>1.5.3 Newton's law of cooling.<br>1.5.4 Orthogonal trajectories to Cartesian and Polar curves.<br>1.6 Examples based on 1.1 to 1.5. | 15 |
| 2 | **Linear differential equations with constant coefficients**<br>2.1 Introduction.<br>2.2 Auxiliary equation, Complementary function.<br>2.3 Types of complementary functions:<br>2.3.1 Distinct real roots, repeated real roots, complex roots, repeated complex roots,<br>2.4 Particular integrals:<br>2.4.1Particular integrals of the functions: $e^{ax}$, $sinax$, $cosax$, $x^m$, $e^{ax}.V$ and $x.V$.<br>2.5 Applications to Electrical circuits.<br>2.6 Examples based on 2.1 to 2.5. | 15 |

**Recommended Book**:

1. D. A. Murray, Introductory Course in Differential Equations, Khosala Publishing House, Delhi.
2. M. D. Raisinghania, Ordinary and Partial Differential Equations, 20th Revised Edition 2022; S.Chand and Company Pvt. Ltd. New Delhi.

**Scope**: Part 1: Unit 2: 2.12 to 2.32, Unit 3: 3.1 to 3.8, Unit 5: 5.1 to 5.25.

**Reference Books:**

1. Dr. A. B. Mathur and V. P. Jaggi, Advanced Engineering Mathematics, Khanna Publishers, 2nd edition, 2001.
2. R. K. Ghosh and K. C. Maity, An Introduction to Differential Equations, Book and Allied (P) Ltd., Seventh Edition, 2000.
3. Zafar Ahasan, Differential Equations and Their Applications, Second Edition, PHI2004.

**B. Sc. Part – I Semester -II Mathematics**
**DSC-IV: 2DSC03MAT22: Discrete Mathematics**
**Theory: 30 hrs.**
**Marks-50 (Credits: 02)**

**Course Outcomes (COs):**

**Upon successful completion of the course students will able to:**

- **CO1:** Analyse the logical structure of statements symbolically, including the proper use of logical connectives, predicates, and quantifiers.
- **CO2:** Construct truth tables, prove or disprove a hypothesis, and evaluate the truth of a statement using the principles of logic.
- **CO3:** Understand and apply the fundamental concepts in graph theory.
- **CO4:** Acquire the basic knowledge of graphs namely vertex, edge, special types of graphs, isomorphic graphs, matrix representation of graphs

| UNIT | Contents | Hours Allotted |
|---|---|---|
| 1 | **Propositional Calculus**<br>1.1 **Revision**<br>1.1.1 Propositional Logic.<br>1.1.2 Propositional equivalence.<br>1.2 **Predicates and Quantifiers:**<br>1.2.1 Predicate, n-place Predicate, N-ary Predicate.<br>1.2.2 Quantification and Quantifiers, Universal Quantifier, Existential Quantifier, Quantifiers with restricted domains.<br>1.2.3 Logical Equivalence involving Quantifiers.<br>1.3 **Rules of Inference:**<br>1.3.1 Argument in propositional Logic.<br>1.3.2 Validity Argument (Direct and Indirect methods)<br>1.3.3 Rules of Inference for Propositional Logic.<br>1.3.4 Building Arguments<br>1.4 Numerical Problems based on 1.2 to 1.3 | 15 |
| 2 | **Graph Theory**<br>2.1 **Graphs:**<br>2.1.1 Basic Terminology<br>2.1.2 Special types of Graphs (Complete graph, Regular graph, Bipartite and complete Bipartite graph)<br>2.1.3 Isomorphism<br>2.1.4 Adjacency and Incidence Matrix of Graph<br>2.1.5 Problems based on 2.1.2 to 2.1.4<br>2.2 **Operations on Graph:**<br>2.2.1 Subgraphs, vertex deletion, Edge addition.<br>2.2.2 Complement of a graph and self-complementary graphs.<br>2.2.3 Union, Intersection and Product of graphs.<br>2.2.4 Problems based on 2.1.1 to 2.1.3 | 15 |

**Recommended Book:**

1. S. R. Patil , M. D. Bhagat , R. S. Bhamare, S. M. Waingade, N. M. Phatangare and K. D. Masalkar, Discrete Mathematics, Nirali Prakashan, Pune.

**Reference Books:**

1. D. S. Malik and M. K. Sen, Discrete Mathematics, Cengage Learning India Pvt. Ltd, New Delhi.
2. Kolman & Busby & Ross, Discrete Mathematical Structures (sixth edition), Pearson Education (Prentice Hall).
3. Mamta Chaudhary & Vani Sharma & Pooja Yadav, Introduction to Graph Theory, Sultan Chand & Sons, Educational Publishers, New Delhi.
4. Seymour Lipschutz, Marc Lipson, Schums Outline of Discrete Mathematics, Revised Third Edition-McGraw-Hill (2009).

**B. Sc. Part – I Semester -II Mathematics**

**OEC MTS PR – II: 2OEC03MTS21: Quantitative aptitude**

**Theory: 30 hrs.**

**Marks-50 (Credits: 02)**

**Course Outcomes (COs):**

**On completion of the course, the students will be able to:**

**CO1:** Understand the basic concepts of quantitative ability

**CO2:** Familiarize basic concepts of Logarithms.

**CO3:** Solve quantitative problems by using short-cut method

**CO4:** Compete in various competitive exams like CAT, CMAT, GATE, GRE, UPSC, GPSC etc.

| **Practical:** |
|---|
| 1) Examples of HCF and LCM |
| 2) Examples on Logarithm |
| 3) Examples on Average and Percentage |
| 4) Examples on Profit and Loss |
| 5) Examples on Ratio and Proportion |
| 6) Examples on Partnership |
| 7) Examples on Pipe and Cisterns |
| 8) Examples on Time and Work |
| 9) Examples on Time and Distance |
| 10) Examples on trains |

**Reference Books:**

1. R. S. Aggarwal, Quantitative Aptitude, S. Chand Publications.
2. Arun Sharma, How to prepare for Quantitative Aptitude for CAT, Mc Graw Hill.

**B. Sc. Part – I Semester -II Mathematics**

**DSC-PR-II: 2DSC03MAT29 DSC MATHEMATICS LAB – II**

**Practical Four Lectures of 60 minutes per week per batch**

**Marks-25 (Credits: 02)**

**Course Outcomes (COs)**

**On completion of the course, the students will be able to:**

**CO1:** Understand the basic concepts of Differential Equations, their solutions and types

**CO2:** Familiarize applications of differential equation.

**CO3:** Understand concepts like Complementary Function (C.F.), Particular Integral (P.I.)

**CO4:** Understand concepts and applications of basic graph

| **Practical:** |
|---|
| 1. Differential equations reducible to exact |
| 2. Linear differential equations |
| 3. Bernoulli's Differential equations |
| 4. Law of growth |
| 5. Law of Decay |
| 6. Newton's law of cooling |
| 7. Orthogonal Trajectories to Cartesian Curves |
| 8. Orthogonal Trajectories to Polar Curves |
| 9. Linear differential equations with constant coefficients (examples on finding C. F.) |
| 10. Particular integrals of the functions: $e^{ax}$, $sin\ ax$, $cos\ ax$, |
| 11. Particular integrals of the function $x^m$, $e^{ax}$ . $V$ and $x.\ V$ |
| 12. Test the validity of the argument using truth table. |
| 13. Show the implications without using truth table. |
| 14. Draw the graph represented by the given adjacency matrix. |
| 15. Find the incidence matrix of the given graphs. |

**Recommended Book:**


1. S. R. Patil , M. D. Bhagat , R. S. Bhamare, S. M. Waingade, N. M. Phatangare and K. D. Masalkar, Discrete Mathematics, Nirali Prakashan, Pune.
2. M. D. Raisinghania, Ordinary and Partial Differential Equations, 20th Revised Edition 2022; S.Chand and Company Pvt.Ltd.NewDelhi.

# Question Paper Format:

| Seat No. | |
|---|---|

| Ques. paper code | |
|---|---|

**VIVEKANAND COLLEGE, KOLHAPUR**

**(EMPOWERED AUTONOMOUS)**

B.Sc. Part- I (Mathematics) (Semester-I) Examination……..

Course Code and Name: 2DSC03MAT11:

Day: Time: 2 hours

Date: --/--/---- Marks : 40

**Instructions:**

*1) All the questions are compulsory.*

*2) Figures to the right indicate full marks.*

*3) Draw neat labeled diagrams wherever necessary.*

*4) Use of log table/calculator is allowed.*

---

**Q. 1. Select correct alternative (One mark each): [8]**

i) ----------

a) -------- b) -------- c) -------- d) --------

ii) ----------

a) -------- b) -------- c) -------- d) --------

iii) ----------

a) -------- b) -------- c) -------- d) --------

iv) ----------

a) -------- b) -------- c) -------- d) --------

v) ----------

a) -------- b) -------- c) -------- d) --------

vi) ----------

a) -------- b) -------- c) -------- d) --------

vii) ----------

a) -------- b) -------- c) -------- d) --------

viii) ----------

a) -------- b) -------- c) -------- d) --------

**Q.2. Attempt any TWO (Eight marks each): [16]**

i) .

ii) .

iii) .

**Q.3. Attempt any FOUR (Four marks each): [16]**

i) .

ii) .

iii) .

iv) .

v) .

vi) .

**Evaluation Pattern for practical Course:**

**Marks Distribution of Practical (LAB) course: Total Marks: 100**

| Course | Experimental work | Journal assessment | Seminar/ Mini Project | Total Marks |
|---|---|---|---|---|
| Major | 20 | 05 | - | 25 |
| OE | 20 | 05 | - | 25 |

**Equivalence of Courses:**

**B.Sc. Part I (Semester I and II)**

| Semester | Old Course | | | Course in NEP Phase-II | | |
|---|---|---|---|---|---|---|
| | **Course code** | **Course Name** | **Credits** | **Course code** | **Course Name** | **Credits** |
| **I** | DSC-1003A | Algebra And Geometry | **2** | 2DSC03MAT11 | Basic algebra | **2** |
| | DSC-1003A | Calculus | **2** | 2DSC03MAT12 | Calculus | **2** |
| **II** | DSC-1003B | Ordinary differential Equations | **2** | 2DSC03MAT21 | Differential Equations I | **2** |
| | DSC-1003B | Multivariable Calculus | **2** | 2DSC03MAT22 | Discrete Mathematics | **2** |
| | DSC-1003(PR) | Computational Mathematics Lab | **4** | 2DSC03MAT19 | DSC Mathematics Lab-I | **2** |
| | | | | 2DSC03MAT29 | DSC Mathematics Lab-II | **2** |