NMKRV COLLEGE FOR WOMEN
DEPARTMENT OF MATHEMATICS
SECOND SEMESTER
MATHEMATICS – II

THEORY SYLLABUS FOR JUNE/JULY 2020
END SEMESTER EXAMINATION

I. ALGEBRA - II

Group Theory

Binary operation, algebraic structure-problems on finding identity and inverse. Definitions of semigroup and group, abelian group . Properties of group with proof.

II. CALCULUS

1. Differential Calculus-II

Polar coordinates - Angle between the radius vector and the tangent - Angle of intersection of curves (polar form) polar sub-tangent and polar subnormal-perpendicular from pole on the tangent - Pedal equations. Derivative of an arc in Cartesian, parametric and polar forms.

2. Integral Calculus- II

Applications of Integral Calculus: computation of length of arc, plane area and surface area and volume of solids of revolutions for standard curves in Cartesian and Polar forms.

3. Differential equations

Definition and examples, Variable separable method, reducible to variable separable, Homogenous equations, equations reducible to non homogenous.

LIST OF PRACTICALS FOR JUNE/JULY 2020
END SEMESTER EXAMINATIONS

1. **Creating simple scilab program**
2. **Plotting of standard curves**
3. **Surface area and volume of revolution.**
4. **Group theory**
5. **Solving differential equations using Scilab/Maxima.**

NMKRV COLLEGE FOR WOMEN
DEPARTMENT OF MATHEMATICS
FOURTH SEMESTER
MATHEMATICS – IV

THEORY SYLLABUS FOR JUNE/JULY 2020
END SEMESTER EXAMINATION

I. ALGEBRA –IV

1. Groups

Normal subgroups-Theorems, examples and problems, definition of centre of a group, normalizer of a group-based theorems.

2. MATHEMATICAL METHODS - I

Definition and basic properties Laplace transform of some common functions and Standard results ,Convolution theorem (statement only) and inverse convolution, Inverse Laplace transforms and problems.

II. CALCULUS

3. Differential Calculus

Definition of the limit of a function in ε-δ form –continuity- types of discontinuities. Differentiability- Differentiability implies Continuity Converse not true. Maclaurin's expansion. Evaluation of limits by L'Hospital's rule

LIST OF PRACTICALS FOR JUNE/JULY 2020
END SEMESTER EXAMINATIONS

1. **Write a program to check whether the given subgroup H=[1,-1] of a group G=[1,-1,i,-i] is Normal Subgroup of group G. (Scilab Program)**
2. **Write a program to find the Laplace Transform of Cos(mt), e^(mt)**
3. **Write a program to find the Inverse Laplace Transform of s/(s+4)^2**
4. **Taylor's theorem.**
5. **Maclaurin's theorem.**
6. **Evaluation of limits by L'Hospital's rule.**

NMKRV COLLEGE FOR WOMEN
DEPARTMENT OF MATHEMATICS
SIXTH SEMESTER
MATHEMATICS – PAPER- VII

THEORY SYLLABUS FOR JUNE/JULY 2020
END SEMESTER EXAMINATION

1. ALGEBRA –VI 1.

Linear Algebra

Vector space – Examples – Properties – Subspaces – criterion for a subset to be a subspace linear span of a set - linear combination – linear independent and dependent subsets – Basis and dimensions– Standard properties – Examples illustrating concepts and results. Linear transformations – properties

2. Partial Differential Equations

Simultaneous equations of the form dX = dY = dZ. Formation of partial differential equation.Equations of First Order Lagrange's linear equation – Charpit's method, Standard types of first order non-linear partial differential equation (By known substitution).Partial differential equations type-I,II,III and IV.

LIST OF PRACTICALS FOR JUNE/JULY 2020
END SEMESTER EXAMINATIONS
MATHEMATICS – PAPER- VII

1. **Expressing a vector as a linear combination of given set of vectors.**
2. **Examples on linear dependence and independence of vectors.**
3. **Basis and dimension.**
4. **Verifying whether a given transformation is linear.**
5. **Solutions to the problems on different types of partial differential equations Type1**
6. **Solutions to the problems on different types of partial differential equations Type2**
7. **Solutions to the problems on different types of partial differential equations Type3**
8. **Solutions to the problems on different types of partial differential equations Type4**

NMKRV COLLEGE FOR WOMEN
DEPARTMENT OF MATHEMATICS
SIXTH SEMESTER
MATHEMATICS -PAPER- VIII

THEORY SYLLABUS FOR JUNE/JULY 2020
END SEMESTER EXAMINATION

ANALYSIS - III

1. Complex Analysis

Complex numbers-Cartesian and polar form-geometrical representation-complex-Plane-Euler's formula- $e^{i\theta} = \cos\theta + i\sin\theta$. Functions of a complex variable-limit, continuity and differentiability of a complex function. Analytic function Cauchy Riemann equations in Cartesian and Polar forms-Sufficiency conditions for analyticity(Cartesian form only)-Harmonic function-standard properties of analytic functions-construction of analytic function when real or imaginary part is given-Milne Thomson method.

2. NUMERICAL METHODS – II

Numerical solutions of algebraic and Transcendental equations – method of successive bisection - method of false position – Newton-Raphson method. Numerical solutions of non-Homogeneous system of linear algebraic equations in three variables by Jacobi's method and Gauss-Seidel method.

LIST OF PRACTICALS FOR JUNE/JULY 2020
END SEMESTER EXAMINATIONS
MATHEMATICS -PAPER- VIII

1. **Some problems on Cauchy-Riemann equations (polar form).**
2. **Implementation of Milne-Thomson method of constructing analytic**
3. **Illustrating orthogonality of the surfaces obtained from the real and imaginary part of an analytic function.function(simple examples).**
4. **Verifying real and imaginary parts of an analytic function being harmonic (in polar form).**
5. **Solving algebraic equation (Bisection method).**
6. **Solving algebraic equation (Regula-Falsi and Newton-Raphson methods).**
7. **Solving system of equations by Jacobi method**
8. **Solving system of equations by Gauss-Seidel method.**