**ANNEXURE – I**

**STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU**

**DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS**

**N - SCHEME**

(Implements from the Academic year 2019-2020 onwards)

Course Name : All branches of Diploma in Engineering and Technology and Special

Programmes except DMOP, HMCT and film & TV.

Subject Code : 40012

Semester : I Semester

Subject Title : **ENGINEERING MATHEMATICS**

**TEACHING AND SCHEME OF EXAMINATION**

Number of weeks per semester: 15 weeks

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| Subject | Instructions | | Examination | | | |
| ENGINEERING MATHEMATICS | Hours / Week | Hours / Semester | Marks | | | Duration |
| 7 Hrs. | 105 Hrs. | Internal Assessment | Board Examination | Total |
| 25 | 100 \* | 100 | 3 Hrs. |

\* Examination will be conducted for 100 Marks and it will be reduced to 75 Marks.

**Topics and Allocation of Hours:**

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| **UNIT** | **Topic** | **Time** |
| 1 | Algebra and Basics of Complex Number | 18 Hrs. |
| 2 | Complex Number and Trigonometry | 18 Hrs. |
| 3 | Differential Calculus | 20 Hrs. |
| 4 | Partial Differentiation & Integration | 20 Hrs. |
| 5 | Vector Algebra | 19 Hrs. |
|  | REVISION, ASSESMENT TEST AND MODEL EXAM | 10 Hrs. |
|  | **Total** | **105 Hrs** |

**40012 ENGINEERING MATHEMATICS**

**DETAILED SYLLABUS**

**Contents: Theory**

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| UNIT | NAME OF TOPIC | Time |
| I | *ALGEBRA &COMPLEX NUMBER*  1.1 DETERMINANTS: Definition and expansion of determinants of order 2 and 3.Properties of determinants(not for examination)-Solution of simultaneous equations using Cramer’s rule(in 2 and 3 unknowns)- Simple problems.  1.2 MATRICES : Adjoint of a matrix and inverse of a matrix – Rank of a matrix by determinant form.(matrix of order 3 x 4) – Definitions of Factorial notation –definition of Permutation and Combination (not for examination). Binomial Theorem for rational index upto -2(statement only)- Expansion only for -1, and -2.  1.3 ALGEBRA OF COMPLEX NUMBERS: Definition - Real and Imaginary parts, conjugates, Modulus and amplitude form, Polar form(definition only),multiplication and division of complex numbers (geometrical proof not needed) – Simple problems. | 6 Hrs.  6 Hrs.  6 Hrs. |
| II | *COMPLEX NUMBER & TRIGONOMETRY*  2.1 DE MOIVRE’S THEOREM: DeMoivre’s Theorem (statement only) - Related problems.  2.2 ROOTS OF A COMPLEX NUMBER: Find the nth roots of unity- solving equation of the form xn ±1 =0 where n≤7. Simple Problems.  2.3 COMPOUND ANGLES: Expansion of sin(A±B), cos(A±B) and tan(A±B) (without proof) –Multiple angle of 2A and 3A (Formula only)- Sum and Product formulae - Simple Problems. | 6 Hrs.  6 Hrs.  6 Hrs. |
| III | *DIFFERENTIAL CALCULUS*  3.1 LIMITS: Definition of limits. Problems using the following results:  (i) xn-an/x-a (ii) =1 (iii) =1(in radians) (results only) - Simple Problems.  3.2 DIFFERENTIATION: Definition – Differentiation of xn, sinx, cosx, tanx, cosecx, secx, cotx, logx, ex, u±v, uv, uvw, u/v (v≠0). Simple Problems.  3.3 DIFFERENTIATION METHODS: Differentiation of function of function(Chain Rule) - Successive Differentiation up to second order (Parametric form not included). Simple Problems. | 6 Hrs.    7 Hrs.    7 Hrs. |
| IV | *PARTIAL DIFFERENTIATION & INTEGRATION*  4.1 PRTIAL DIFFERENTIATION: Definition –Partial differentiation of two variables up to second order only. Simple Problems.  4.2 INTEGRATION: Introduction – Definition of integration- Integral values using reverse process of differentiation – Integration using decomposition method. Simple Problems.  4.3 INTEGRATION BY SUBSTITUTION: Integrals of the form f’(x)dx, n≠ -1, dx and . Simple Problems. | 7 Hrs.  6 Hrs.  7 Hrs. |
| V | *VECTOR ALGEBRA*  5.1 VECTOR INTRODUCTION: Definition of Vector –types, addition and subtraction of vectors, Properties of addition and subtraction - Position vector. Resolution of vector in two and three dimensions. Direction cosines, Direction ratios. Simple problems.  5.2 SCALAR PRODUCT OF VECTORS: Definition of Scalar product of two vectors, Geometrical meaning - properties – angle between two vectors. Simple Problems.  5.3 VECTOR PRODUCT OF VECTORS: Definition of vector product of two vectors –Geometrical meaning –properties angle between two vectors – Unit vectors perpendicular to two vectors - Simple Problems. | 6 Hrs.  7 Hrs.  6 Hrs. |

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| UNIT | ENGINEERING MATHEMATICS | hrs |
| I | **Algebra and Complex Number:**  1.Determinants.  2.Matrices, Binomial Theorem.  3.Complex Number. | 18 |
| II | **Complex Number and Trigonometry:**  1.DeMoivre’s Theorem.  2.Roots of a complex number.  3.Compount Angles. | 18 |
| III | **Differential Calculus:**  1.Limits.  2.Differentiation.  3.Differentiation Methods. | 20 |
| IV | **Partial Differentiation and Integration:**  1.Partial Differentiation.  2.Integration.  3.Integration by substitution. | 20 |
| V | **Vector Algebra :**  1.Vector Introduction.  2.Scalar Product of Two Vectors.  3.Vector Product of Two Vectors. | 19 |