BOARD OF TECHNICAL EXAMINATIONS, GOA STATE

(3006) Engg. Mathematics III

Semester	Theory	Test	Total	TW	PR	Gr Total
	75	25	100	–	–	100

Lectures per week (hrs): **4**

Practicals per week (hrs): **NIL**

Course Credits **3**

Theory Marks: **100**

(One paper 3 hrs)

Prog. Ass. Marks: **25**

Rationale: The syllabus aims at providing the necessary basis for group of students aiming at engineering programmes.

Sr. No.	Course Content	Hrs.	Marks
I	**Numerical Methods** 1.1 Newton Raphson Method 1.2 Newton Forward difference and Newton Backward Difference formal	8	10
II	**Derivatives** 2.1 Derivatives of the nth order including problems based on partial Fractions 2.2 Leibnitz's Theorem for the nth order derivative of the Product of two functions	7	15
III	**Vector Algebra** 3.1 Definition of scalars and vectors 3.2 (a) Addition and subtraction of vectors (b) Multiplication of a vector by a scalar (c) position vector of a point (No problems to be asked on proofs of Geometrical results) 3.3 i) Scalar product (Dot product) ii) Vector product (cross product)	10	15
IV	**Fourier Series** 4.1 Introduction 4.2 Definition a Fourier series in an interval of width 2 c, a) Euler's Formula b) Expansions of Odd & Even Functions 4.3 Fourier Series of functions having a single point of discontinuity. 4.4 Half range sine and cosine series (simple algebraic, Trigonometric and exponential functions)	15	20
V	**Laplace Transforms** 5.1 Definition and transforms of elementary functions (without proof) 5.2 Properties of Laplace transform (First shifting property). 5.3 Transforms of Derivatives & Integral 5.4 I) Unit step function and Dirac Delta function (Definition and its Laplace transform only) 5.5 Inverse Laplace Transforms 5.6 Application to first order and first degree differential equation.	14	20

| VI | **Boolean Algebra** | 10 | 20 |

6.1 Mathematical Logic (Questions on truth tables of statements forms only to be asked. No questions on logical circuits to be asked)

6.2 Axioms of Boolean Algebra, uniqueness of the complement theorem

6.3, Principle of duality, Laws of Idempotence,

Associative law, absorption law, De Morgan's Law and simple problems based on the above.

Instructions to Paper-Setters/Model Question Paper:-

I) The question paper will consist of 5 questions

ii) Question I will carry 20 marks and is compulsory. This should cover the entire syllabus. This can be of one of the following types.

a) 10 questions from the entire syllabus carrying 2 marks each

b) part (A) 4 questions of 3 marks each and part (B) 4 question of 2 marks each

(c) Part (A) 4 questions of 3 marks each and part (B) 2 questions of 4 marks each

(iii) Question II to question V will have sub – 5 questions of 5 marks each (can be two questions of 2 and 3 marks each) and the student will be required to attempt any 4 sub – questions. The pattern of the questions from II to V should be as follows.

Q (II)

i) 1.1, ----------------------------- 5 marks

ii) 1.2 ----------------------------- 5 marks

iii) 2.1----- --------------------- 5 marks

iv) 2.1----------------------------- 5 marks

v) 2.2----------------------------- 5 marks

Q(IV)

i) 4.3 ----------------------------- 5 marks

ii) 4.4 ----------------------------- 5 marks

iii) 5.1, 5.2--------------------- 5 marks

iv) 5.3----------------------------- 5 marks

v) 5.5 ----------------------------- 5 marks

Q (III)

i) 3.2 ----------------------5 marks

ii) 3.3(i) ----------------------5 marks

iii) 3.3(ii)----------------------5 marks

iv) 4.2(a) ----------------------5 marks

v) 4.2(b) ----------------------5 marks

Q(V)

i) 5.6 ----------------------------- 5 marks

ii) 6.1----------------------------- 5 marks

iii) 6.2----------------------------- 5 marks

iv) 6.3----------------------------- 5 marks

v) 6.3----------------------------- 5 marks

Reference Books:-
1) Higher Engineering Mathematics – By B. s. Grewal
2) Engineering Mathematics I & II – by S.S. Sastry.
3) Mathematics for Polytechnic students – by Manjit singh.