

TSECET – 2021

Syllabus: B. Sc.,(MATHEMATICS) GRADUATES MATHEMATICS (100 MARKS)

Unit- I

Successive differentiation - Expansions of Functions - Mean value theorems - Indeterminate forms - Curvature and Evolutes - Partial differentiation - Homogeneous functions- Total derivative - Maxima and Minima of functions of two variables –Asymptotes- Envelopes.

Unit- II

Differential Equations of first order and first degree : Exact differential equations - Integrating Factors - Change of variables - Total Differential Equations of the form $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ - Differential Equations first order but not of first degree - Equations Solvable for y - Equations Solvable for x - Equations that do not contain x or y - Clairaut's equation.

Unit- III

Higher order linear differential equations : Solutions of homogeneous linear differential equations with constant coefficients - Solutions of non-homogeneous differential equations $P(D)y = Q(x)$ with constant coefficients by means of polynomial operators when $Q(x) = be^{ax}$, $b \sin ax / b \cos ax$, bx^k , $\forall e^{ax}$.

Partial Differential equations - Formation and solutions - Equations easily integrable - Linear equations of first order.

Unit- IV

Sequences: Limits of Sequences - Limit Theorems for Sequences - Monotonic Sequences - Cauchy Sequences – Subsequences - Lim sup's and Lim inf's – Series – Tests for convergence - Alternating Series.

Unit- V

Sequences and Series of Functions : Power Series - Uniform Convergence - More on Uniform Convergence - Differentiation and Integration of Power Series.

The Riemann Integral - Properties of Riemann Integral - Fundamental Theorem of Calculus.

Unit- VI

Groups: Definition and Examples of Groups - Elementary Properties of Groups - Finite Groups - Subgroups - Subgroup Tests - Cyclic Groups - Properties of Cyclic Groups - Permutation Groups – Homomorphism – Isomorphism of Groups and their properties – Automorphism – Cosets – Normal Sub Groups.

Unit- VII

Introduction to Rings : Examples of Rings - Properties of Rings – Subrings - Integral Domain – Field - Characteristics of a Ring - Ideals and Factor Rings - Prime Ideals and Maximal Ideals - Ring of Homomorphism – Isomorphism of Rings and their properties - The Field of Quotients of Polynomial Rings – Fundamental Theorem of Homomorphism.

Unit- VIII

Vector Spaces : Vector Spaces and Subspaces - Null Spaces - Column Spaces - Linear Transformations - Linearly Independent Sets - Bases - Coordinate Systems -The Dimension of a Vector Space - Rank-Change of Basis.

Unit – IX

Eigen values and Eigen vectors - The Characteristic Equation - Diagonalization –Eigen vectors and Linear Transformations - Complex Eigen values– Inner Product – Length - Orthogonality - Orthogonal Sets.

Unit- X

Solutions of Equations in One Variable : The Bisection Method - Fixed-Point Iteration - Newton's Method and Its Extensions - Error Analysis for Iterative Methods - Accelerating Convergence - Zeros of Polynomials - Interpolation - Lagrange Polynomial - Divided Differences - Numerical Differentiation and Integration.

TSECET - 2021
B. Sc.,(MATHEMATICS) GRADUATES MATHEMATICS

MODEL QUESTIONS

1. The Number of homomorphism's from Z_3 to Z_8
1) 8 2) **24** 3) 32 4) 42
2. The value of c for $f(x) = |x|$ in $[-1,1]$ by using Rolle's theorem
1) -1 2) 0 3) 1 4) **does not exist**
3. The eigen values of skew-hermitan matrix are
1) real 2) **purely imaginary** 3) both real and imaginary 4) do not exist
4. V is a Inner Product space over the field of complex numbers α is 1, $1+i$, $1-i$ then $\|\alpha\| =$
1) $\sqrt{5}$ 2) $\sqrt{3}$ 3) $\sqrt{2}$ 4) $\sqrt{7}$
5. The Complimentary function of $(D^2 - 5D + 6)y = 0$
1) $y_c = C_1 e^{2x} + C_2 e^{3x}$ 2) $y_c = C_1 e^{2x} - C_2 e^{3x}$
3) $y_c = C_1 e^{-2x} + C_2 e^{3x}$ 4) $y_c = C_1 e^{-2x} + C_2 e^{-3x}$

TS ECET - 2021
SYLLABUS FOR B. Sc (MATHEMATICS) GRADUATES

ANALYTICAL ABILITY

(50 Marks)

- 1. Data Sufficiency:** A question is given followed by data in the form of two statements labeled as I and II. If the data given in I alone is sufficient to answer the question then choice (1) is the correct answer. If the data given in II alone is sufficient to answer the question, then choice (2) is the correct answer. If both I and II put together are sufficient to answer the question by neither statement alone is sufficient, then Choice (3) is the correct answer. If both I and II put together are not sufficient to answer the question and additional data is needed, then choice (4) is the correct answer .

- 2. a. Sequences and Series:** Analogies of numbers and alphabets completion of blank spaces following the pattern in A: b:: C:d relationship odd thing out; Missing number in a sequence or a series.

b.Data Analysis: The data given in a Table, Graph, Bar Diagram, Pie Chart, Venn diagram or a passage is to be analyzed and the questions pertaining to the data are to be answered.

c.Coding and Decoding Problems: A code pattern of English Alphabet is given. A given word or a group of letters are to be coded and decoded based on the given code or codes.

d. Date, Time and Arrangement Problems: Calendar problems, Clock Problems, Blood Relationship, Arrivals, Departures and Schedules; Seating Arrangements, Symbol and Notation Interpretation.

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SYLLABUS FOR B. Sc (MATHEMATICS) GRADUATES

ANALYTICAL ABILITY

Model Questions

1. From his house, Lokesh went 15 kms to the north. Then, he turned west and covered 10 kms. Then, he turned south and covered 5 kms. Finally, turning to east, he covered 10 kms. In which direction is he from his house
1. East 2. West **3. North** 4. South

2. Appreciation is related to reward in the same way as disgrace is related to
1. Crime 2. Guilt 3. Allegation **4. Punishment**

3. What is next number in the series 2, 9, 28, 65,
1. 122 2. 128 3. **126** 4. 144

3. Pointing towards a girl, Ramesh said “ She is the Daughter of only daughter of my grandfather”. How is that girl is related to Ramesh ?
1. Uncle 2. **Sister** 3. Cousin 4. Data Inadequate

4. Joule is related to energy in the same way as pascal is related to
1. Volume 2. **Pressure** 3. Density 4. Purity

5. If 24th January 2021 was Sunday. What will be the day on 22nd March 2021?
1. Tuesday 2. Thursday 3. Saturday **4. Monday**

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TS ECET 2021
SYLLABUS: BSc (Mathematics) Graduates
Communicative English

(50 marks)

I. Vocabulary

1. Synonyms
2. Antonyms
3. Spelling
4. One Word Substitutes
5. Words often Confused
6. Idioms
7. Phrasal verbs

II. Grammar

8. Articles
9. Prepositions
10. Conjunctions
11. Active/Passive Voice
12. Tenses
13. Concord
14. Correction of Sentences

III. a. Reading Comprehension
b. Reading Comprehension

TS ECET 2021
BSc (Mathematics) Graduates

Communicative English

Sample Questions

1. Choose the correct one word substitute to make it a meaningful sentence.
'The CEO of Microsoft can speak many languages. He is a _____.'
 - 1) Bilingual
 - 2) Foreigner
 - 3) **Polyglot**
 - 4) Monolingual
2. Choose the correctly spelt word form the following set of words.
 - 1) Maintanence
 - 2) Maintenance
 - 3) Maintainance
 - 4) **Maintenance**
3. Choose the correct article to make it a meaningful sentence.
'The Director and _____ officer concerned has called for a meeting just now.'
 - 1) The
 - 2) **No article required**
 - 3) A
 - 4) An
4. Choose the correct antonym for 'smart' in the following sentence.
'He is a smart boy. He could solve the problem very quickly.'
 - 1) **Stupid**
 - 2) Strange
 - 3) Handsome
 - 4) Intelligent
5. Choose the correct synonym for 'evolve' from the options given below.
 - 1) Leave
 - 2) **Emerge**
 - 3) Arrange
 - 4) Involve
