AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPURA

1. The syllabus in Mathematics for Two Semesters B.A/B.Sc. Degree Course

2. Following table shows the number of teaching hours, examination pattern and marks.

		Semesters I & II
Number of papers in each Semester		1
Teaching Hours per paper per Week	Teaching Problem Solving **Total**	4 Hours 1 Hour **5 Hours**
Examination pattern in each paper in each semester	Duration of Examination	3 Hours
i)Examination marks	a. Maximum b. Minimum for pass	80 32
ii) Internal Assessment marks	a. Maximum b. Minimum for pass	20 08
iii) Total Marks	a. Maximum b. Minimum for pass	100 40

3. Internal assessment marks in each paper shall be awarded by the concerned course teacher based on the two class tests each of one-hour duration conducted during semester.

4. The internal assessment marks awarded shall be carried forward for the repeated examination.

5. The maximum strength of each section for teaching hours is restricted to sixty students only.

   6. Problem solving classes be conducted in batches of not more than **15** students in each batch.

B.A/B.Sc. DEGREE COURSE STRUCTURE FOR MATHEMATICS SUBJECT
[SPREAD OVER TWO SEMESTERS]

SEMESTER-I

Paper No	Paper Title	Content of Topics
I	Algebra-I	Complex Numbers, Theory of Equations, Matrices.

SEMESTER-II

Paper No	Paper Title	Content of Topics
II	Calculus-I	Continuity, Differentiability, Successive differentiation and Functions of more than one independent variable.

Algebra-I

I. Complex Numbers:

De-Movier's Theorem with proof and some examples, Roots of complex numbers and solution of equations.   **14 Hrs**

II. Theory of Equations:

Relation between the roots and coefficients of general polynomial equation in one variable(only Bi-quadratic Equations), Synthetic Division, Transformations of equations- Increasing and Decreasing the roots by h, To multiply the roots by a given quantity, To transform an equation into another whose roots are the reciprocals of the roots of the given equation. Descartes rule of signs. Solution of cubic equation by Cardon's methods- $ax^3+bx^2+cx+d=0$, $px^3+qx^2+r=0$ and standard cubic equations by trigonometric method. Solution of Biquadratic equations by Descarte's methods.   **22 Hrs**

III. Matrices:

Recapitulation of matrix algebra (Basic concepts), rank of a matrix, elementary operations, equivalent matrices, Elementary matrices, invariance of rank under elementary operations, Echelon and Normal form of a matrix, inverse of a non- singular matrix by elementary operations. System of m-linear equations in n unknowns, matrices associated with linear equation, criterion for existence of non-trivial solution of homogeneous and non-homogeneous system, criterion for uniqueness of solutions. Eigen values and Eigen vectors of square matrix-Cayley-Hamilton theorem - Applications.   **24 Hrs**

Note: Internal marks: 20

References:
1. A Text Book of Mathematics by G K Ranganath (S Chand & Company).
2. College Mathematics Vol-I by Rudraiah edited (Sapna Book House, Bangalore)
3. Theory and Problems of Matrices by Frank Ayres (Schaum's Outline Series).
4. Textbook of Matrix Algebra by Suddhendu Biswas (PHI Learning Pvt. Ltd. Copyright).
5. Theory of equations by Uspenskey.
6. Complex Numbers by B.S.Tyagi.
7. First Course in Real Analysis by M K Sinhal and Asha Rani.
8. Mathematical Analysis by Shanti Narayan (S Chand & Company).
9. A Course in B.Sc., Mathematics I by S.S.Bhoosnurmath, C.S.Salimath, V.S.Shetiya (Eastern book promoters, Belgaum)

Calculus-I

Continuity and Differentiability:

Recapitulation of limits, continuity and bounds of functions infinite limit, limit of infinity, types of discontinuity. Algebra of continuous functions (Statement only). Properties of continuous functions (Statement only). Differentiability of functions including hyperbolic functions(with definition), Rolle's theorem, Lagrange's theorem and Cauchy's Mean value theorems. Taylor's theorem. Taylor's & Maclaurin's series. Indeterminate forms and L'Hospital Rule with proof and examples(6 forms). **22 Hrs**

Successive Differentiation:

Recapitulation of differentiation, Successive Differentiation, standard formula for nth derivative of the functions $(ax+b)^n$, $\log(ax+b)$, e^{ax}, $\sin(ax+b)$, $\cos(ax+b)$, $e^{ax}\sin(bx+c)$, $e^{ax}\cos(bx+c)$, Leibnitz's theorem and applications. **16 Hrs**

Functions of more than one independent variable:

Limit and continuity, partial derivatives, partial derivatives of higher order, homogeneous functions. Euler's theorem on homogeneous functions of second order and examples thereon. Total derivatives, total differentials , Differentiation of implicit functions Jacobian's. Dependent and independent functions Properties of Jacobin's and functional relations. **22 Hrs**

Note: Internal mark: 20

References:

1) Differential Calculus by Shanthi naryan (S.Chand & Co)

2) Advanced Calculus by Murry R Spiegal (Schaum Series)

3) Mathematical Analysis by S.C.Malik (Wiley Eastern)

4) College mathematics Vol 1 Edited by Dr. N.Rudraiah (Spana book sellers)

5) Modern College Calculus by D.C. Pavate (Karnatak University, Dharwad)

6) B.Sc., Mathematics by G.K.Ranganath (S.Chand & co)

7) B.Sc., Mathematics by Prof. V.R.Kulli (Viswa Publications)

8) A Course in B.Sc., Mathematics I by S.S.Bhoosnurmath, C.S.Salimath, V.S.Shetiya (Eastern book promoters, Belgaum).

AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPURA
Department of Mathematics

Model Question Paper for B.Sc.-I semester

Total Marks: 80   **Time: 3 Hrs**

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Instructions:

       1. Part-A : All questions are compulsory

       2. Part-B: Solve any Five questions from Seven questions

Part-A

I. Answer the following questions

1-2 Complex Numbers

3-6 Theory of Equations

7-10 Matrices

Part-B

Answer any Five of the following questions (Each question carries equal marks) 12x5=60

II.

11-12 Complex Numbers

III

13-14 Theory of Equations

IV

15-16 Theory of Equations

V

17-18 Theory of Equations

VI

19-20 Matrices

VII

21-22 Matrices

VIII

23-24 Matrices

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AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPURA

Department of Mathematics

Model Question Paper for B.Sc.-II semester

Total Marks: 80   **Time: 3 Hrs**

Instructions:

1. Part-A : All questions are compulsory

2. Part-B: Solve any Five questions from Seven questions

Part-A

I. Answer the following questions

1-4 Continuity and Differentiability

5-7 Successive Differentiation

8-10 Functions of more than one independent variable.

Part-B

Answer any Five of the following questions (Each question carries equal marks) 12x5=60

II.

11-12 Continuity and Differentiability

III

13-14 Continuity and Differentiability

IV

15-16 Successive Differentiation

V

17-18 Successive Differentiation

VI

19 Successive Differentiation

20 Functions of more than one independent variable

VII

21-22 Functions of more than one independent variable

VIII

23-24 Functions of more than one independent variable

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