B.A./B.Sc. SECOND YEAR EXAMINATION, 2008-2009

MATHEMATICS

(Common for the faculties of Arts & Science)

ıpers	Teaching hours/ week	Examination Hours	Maximum Marks	
			B.A.	B.Sc.
ıeory Papers :				
per I	3	3	70	75
per II	3	3	65	75
per III	3	3	65	75
tal Marks			200	225

3.

Common papers will be set for both the faculties of Arts & Science.

Students are allowed to use simple electronic desk calculators (as per University guidelines)

Mathematical Table/log tables may be used (as per University guidelines).

B.A./B.Sc. SECOND YEAR 2008-2009

MATHEMATICS

PAPER - I
ADVANCED CALCULUS

Note : The question paper will be divided into three section A, B and C as follows:

Section A : In this section, ten questions will be set taking two questions from each unit. Each question will be of short answer type not exceeding 20 words and will carry 3/4 mark. The candidate will be required to attempt all the questions(aggregating 7.5 marks).

Section B : In this section, ten questions will be set taking two questions from each unit. The answer of each will not exceed 250 words or two and a half page. Each question will be of 7.5 marks. The candidate will be required to attempt five questions in all taking one question from each unit (aggregating 37.5 marks).

Section C : In this section, four questions will be set covering all the five units and whose answers shall not exceed 500 words or five pages each. Each question may have sub parts in it and will carry 15 marks. The candidate will be required to attempt any two questions (aggregating 30 marks).

UNIT-I

Continuity. Cauchy and Heine's definition of continuity of a function and their equivalence, discontinuous

functions and their kinds, Properties of continuous functions, properties of functions continuous in closed intervals.

Derivability: Differentiable functions and their properties including Darboux theorem, Examples of continuous and differentiable functions. Roll's theorem, Mean value theorems, Taylor's theorem, their proofs, verifications and applications.

UNIT - II

Partial differentiations, envelopes, Maxima and Minima of two variables and more than two variables including Lagrange's method of undetermined multipliers.

UNIT - III

Beta and Gamma functions and their properties, Evaluation of double and triple integrals, Dirichlet's theorem and Liouville's extension, change of order of integration.

UNIT - IV

Jacobians, change of independent variables.

Vector Calculus: Direction of derivatives, gradient of scalar functions, irrotational Vectors, definition of gradient, divergence of a vector, curl of a vector, curl of the product of a scalar and vector, divergence of a vector product.

UNIT - V

Vector Integration: Gauss's theorem, divergence of the product of a scalar and a vector, Stoke's theorem, surface integral of the curl of a vector, Green's theorem.

References :

1. Differential calculus, by Gorakh Prasad, Pothishala Pvt. Ltd., Allahabad.
2. Integral calculus by Gorakh Prashad, Pothishala Pvt. Ltd., Allahabad.
3. Mathematical Analysis by S.C. Malik, Wiley Eastern Ltd., New Delhi
4. A Course of Mathematical Analysis by Shanti Narayan, S.Chand and Company, New Delhi.
5. An Introduction to Real Analysis by P.K. Jain and S.K.Kaushik, S.Chand and Company, New Delhi.
6. Principles of Mathematical Analysis by Walter Rudin.
7. A first course in Real Analysis by Ranjit Singh Arora.
8. Elements of Real Analysis by Sharma Purohit.
9. Real Analysis by Bhargava, Goyal.
10. Real Analysis by Sharma, Gokhroo.
11. Vector Analysis by B. Spain.
12. Sadish Phalan by Bhargava, Banwari Lal.
13. Sadish Phalan by Gokhroo, Saini.