

Office of the Controller of Exams
UNIVERSITY OF SARGODHA, SARGODHA

Date 28/10/14 NOTIFICATION

28 OCT 2014

To whom marked
No. UOS/Acad/1777

Dated: .10.2014

On the recommendations of the Academic Council, the Vice-Chancellor has been pleased to approve the revised syllabus of Pure & Applied Mathematics with revised titles of papers i.e; A-Course of Mathematics, B-Course of Mathematics and General Mathematics for BA/B.Sc two years pass course for implementation from the session 2014-15 provisionally subject to final approval by the Syndicate. Copy of approved syllabus is attached herewith (annexure-'A', 'B' & 'C').

2. Hence forward, the titles of the paper shall be used as A, B-course of Mathematics in lieu of Pure & Applied Mathematics.


(CH. FAROOQ AHMAD)
Assistant Registrar (Acad)
for Registrar

Distribution:

- Chairperson, Department of Mathematics
- Controller of Examinations
- Principals of Affiliated Colleges.
- Web-Developer (for uploading on university web-site as public notice)
- Notification file

C.C.:

- Dean, Faculty of Science
- Secretary to the Vice-Chancellor
- P.A to Registrar

DCE/T
ACES, 2
28/10/14

ANNEXURE - A
Pure Math
"A"

A-Course of Mathematics
Paper -I

NOTE: Each section having four questions, please attempt any two questions from each section.

SECTION-I (4/12: 17,17,17,17)

Theory of limit and continuity. Solution of Inequalities. Derivatives and its application to business, economics and physics etc. Differentials. Related rates. Higher order derivatives. Leibnitz's theorem. Limits and continuity of functions of two variables. Partial differentiation and its geometrical meaning for functions of two variables. Euler's theorem. Increments and differentials. Chain Rule. Extrema by 2nd order derivative test and by Lagrange multiplier method. General theorems and indeterminate forms. L'Hospital rule and its applications. Increasing and decreasing functions. Intermediate value theorem and its immediate consequence (only statements)

SECTION-II (4/12: 16,16,16,16)

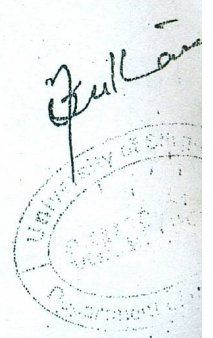
Translation and rotation of axes. Second degree equation with reference to conic section. Properties of conics. Tangents and normal (Cartesian Coordinates). Polar equations of conics. Sketching of curves in polar coordinates. Tangents and normal (Polar Coordinates). Parametric representation of curves. Pedal Equations. Vector spaces and sub spaces. Linearly dependent and independent vectors. Bases and dimension. Linear transformations and matrix of linear transformation. (Relevant theorems of bases and linear transformation without proofs).

SECTION-III (4/12: 17,17,17,17)

Sequences. Bounded Sequences. Cauchy sequences. Convergence and divergence of sequences. Cauchy's theorem. Nth-term test, comparison test, ratio test, root test and integral test for convergence and divergence of infinite series. Convergence and divergence of alternating series. Power series. Complex numbers and their properties. De Moivre's theorem and its applications. Circular, logarithmic and hyperbolic functions. Separation into real and imaginary parts.

Recommended Books

1. Calculus by H. Anton. John Wiley and Sons New York, (Latest Edition).
2. Calculus By C.H Edwards and D.E. Penney. Prentice Hall. Inc (Latest Edition).
3. Calculus By S.I. Grossman. Academic Press Inc (London) Ltd, (Latest Edition).
4. Calculus and Analytic Geometry by S.M. Yousaf. Illmi Kitab Khana. Urdu Bazar Lahore, 5th Edition, 1997.
5. Calculus and analytic geometry by G.B Thomas and R.I. Finney. Adison-Wesley Publishing Company (Latest Edition).
6. Elementary Linear Algebra by C.H. Edwards, Jr and Davide pencey. Prentice Hall international Inc 1988.
7. Mathematical Techniques by K. H. Dar. Irfan-ul-Haq and M.A. Jajja. The Carvan Book House. Kachehry Road Lahore, 9th Edition, 1997.
8. Mathematics Methods by S.M. Yousaf. Illmi Kitab Khana. Urdu Bazar Lahore 2000.
9. Set Theory and Logic by Stoll, Robert R.S. Chand & Co. New Delhi
10. Number Theory by Dr. Manzoor Hussain. The Carvan Book House. Kachehry Road, Lahore.
11. Elementary Linear Algebra by Howard Anton And Chris Rorres. John Willey & Sons. INC 10th Edition, 2010.



199 2

*Pure Math
Paper "B"*

**A-Course of Mathematics
Paper -II**

NOTE: Each section having four questions, please attempt any two questions from each section.

SECTION-I (4/12: 17,17,17,17)

Antiderivatives and indefinite integrals. Methods of integration. Definite integral as limit of sum. Fundamental theorem. Properties. Improper integrals. Reduction formulas. Double and triple integral (simple cases). Area between curves. Length of arc. Intrinsic equations. Asymptotes. Extrema and its application. Singular points. Curvature. Evolutes and envelopes. Volume and surfaces of revolution.

SECTION-II (4/12: 16,16,16,16)

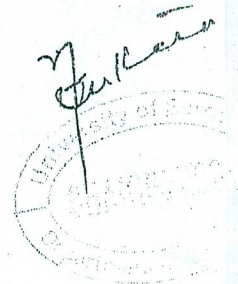
Definition and examples of metric spaces. Open and closed balls and sets. Neighborhoods. Limit points. Interior, exterior and boundary sets. Closure of a set. Complete metric spaces. Definition and examples of topological spaces. Basic properties. Neighborhoods. Limit points. Interior, exterior and boundary sets. Closure of a set. Divisibility. Euclid theorem. Greatest divisor. Least common multiple. Prime factorization theorem. Introduction to elementary logic. Predicate calculus. Methods of proofs.

SECTION-III (4/12: 17,17,17,17)

Definition and examples of a group. Order of an element of a group. Subgroup. Cyclic and permutation groups. Lagrange's theorem. Rings and fields. Algebra of matrices. Co-factors, minors, adjoint and inverse of a matrix. Elementary row and column operations. Echelon form and rank of matrix. Solution of the system of linear equations (Homogeneous and non-homogeneous) by use of matrices. Net work flow problems. Determinants with properties.

Recommended Books

1. Calculus by H. Anton. John Wiley and Sons New York (Latest Edition).
2. Calculus By C.H Edwards and D.E. Penney, Prentice Hall. Inc (Latest Edition).
3. Calculus By S.I. Grossman. Academic Press Inc (Latest Edition).
4. Calculus and Analytic Geometry by S.M. Yousaf. Illmi Kitab Khana. Urdu Bazar Lahore, 1998.
5. Calculus and analytic geometry by G.B Thomas and R.I. Finney, Adison-Wesley Publishing Company (Latest Edition).
6. Elementary Linear Algebra by C.H. Edwards, Jr and Davide penney, Prentice Hall international Inc. 1988.
7. Mathematical Techniques by K. H. Dar, Irfan-ul-Haq and M.A. Jajja, The Carvan Book House, Kachehry Road Lahore, 9th Edition 1997.
8. Mathematical Methods by S.M. Yousaf. Illmi Kitab Khana. Urdu Bazar Lahore 2000.
9. Set Theory and Logic by Stoll, Robert R.S. Chand & Co. New Delhi.
10. Number Theory by Dr. Manzoor Hussain. The Carvan Book House. Kachehry Road, Lahore.
11. Elementary Linear Algebra by Howard Anton And Chris. Rorres. John Willey & Sons. INC 10th Edition, 2010.



APPLIED MATHEMATICS
Paper B.

B-Course of Mathematics
Paper -I

NOTE: Each section having four questions, please attempt any two questions from each section.

SECTION-I (4/12: 17,17,17,17)

Vectors in three-dimensions. Scalar and vector products with applications. Scalar and vector triple products. Differentiation and integration of vector functions. Gradient, divergence and curl. Differential operators. Application to vector analysis. Composition and resolution of co-planer forces. (λ, μ) theorem. Lamy's Theorem. Varignon's Theorem, Moments, Couples and coordinates of equilibrium under the action of co-planer forces.

SECTION-II (4/12: 16,16,16,16)

Types of forces. Direction of forces of constraints, Equilibrium of three co-planer forces and related problems. Center of gravity. Symmetry and Center of mass, Center of mass of various bodies. Frictional forces. Laws of friction. Equilibrium of bodies on rough surfaces. Principle of virtual work and related problems.

SECTION-III (4/12: 17,17,17,17)

Kinematics of a particle in Cartesian and polar co-ordinates. Laws of mechanics. Linear and angular velocity. Relative velocity. Rectilinear motion with uniform and variable acceleration. Simple harmonic motion. Projectile motion. Motion along horizontal and vertical circles. Orbital motion. Elliptic orbit under a central force. Polar form of the orbit. Apse and Apsidal Distance Planetary motion and Kepler's laws.

Recommended Books

1. Theory of Differential Equations of Dennis G.Zill. Books Thomson Learning Academic Resource Center. USA, 8th Edition, 2013.
2. Mathematical Techniques by K.H. Dar, Irfan-ul-Haq and M.A. Jajja. The Carvan Books House. Kachehry Road, Lahore, 9th Edition, 1997.
3. Mathematics Methods by S.M. Yousaf. Illmi Kitab Khana. Urdu Bazar. Lahore 1998.
4. Numerical Analysis by R.L. Burden and J.D. Faires. PES-Kent Publishing Company. Bostan. USA, 9th Edition, 2011.
5. Operations Research by H.A. Taha. Prentice-hall Inc. Englewood. Cliffs USA 4th Edition, 2011.
6. Mathematical Statistics. By Dr. J.E.Freund. Prentice-hall Inc. Englewood. Cliffs USA, 7th Edition, 2007.
7. Vector and Tensor Methods, by Chorlton, Ellis Horwood Publishers, 1976.
8. Elementary Vector Analysis. By Dr. Munawar Hussain. S.M. Hafeez. M.A. Saeed and Ch. Bashir Ahmed. The Caravan Book House, Kachhry Road, Lahore.
9. A Text Book of Fluid Dynamics by Chorlton. Van Nostrand Company Ltd. London, 1967.
10. Mechanics by O.K. Ghori. West Pakistan Publishing Company, Lahore (1971).

Bullana



B-Course of Mathematics

Paper -II

NOTE: Each section having four questions, please attempt any two questions from each section.

SECTION-I (4/12: 17,17,17,17)

Basic concepts of differential equations. Classification and formation of DEs. Various methods of solutions of first order ODE (linear and non-linear). The Bernoulli's, Ricatti and Clairaut's equations. Singular solutions. Orthogonal trajectories. Application of first order ODE in problems of decay and growth, population dynamics, logistic equations. Linear DE of higher order (homogeneous and non-homogeneous). Solution by: D-operator and undetermined co-efficients Methods. Reduction of order and variation of parameters methods for 2nd order linear DE. Cauchy-Euler equation. Power series solution about an arbitrary point.

SECTION-II (4/12: 16,16,16,16)

Laplace Transformation, solution of ODEs. Error analysis. Solution of non-linear (algebraic and transcendental) equation in one variable using bisection method; false position method, Newton - Raphson method and fixed point method. Difference operators. Interpolation (Newton's and Lagrange's methods). Numerical differentiation (at a point of the data). Numerical integration (rectangular, trapezoidal and 1/3 Simpson's rules).

SECTION-III (4/12: 17,17,17,17)

Coordinates in three dimensions. Rectangular, cylindrical and spherical co-ordinates. Equations of plane, straight line, sphere, cylinder, conc. ellipsoid, hyperboloid and paraboloid. Longitude and latitudes. Spherical triangle and direction of Qibla. Inner product space, Eigen values and Eigen vectors, Diagonalization of matrices.

Recommended Books

1. Theory of Differential Equations of Dennis G.Zill. Books Thomson Learning Academic Resource Center. USA, 8th Edition. 2013.
2. Mathematical Techniques by K.H. Dar, Irfan-ul-Haq and M.A. Jajja. The Carvan Books House. Kachehry Road, Lahore, 9th Edition. 1997.
3. Mathematics Methods by S.M. Yousaf. Ulmi Kitab Khana. Urdu Bazar, Lahore 1998.
4. Numerical Analysis by R.L. Burden and J.D. Faires. PES-Kent Publishing Company. Bostan. USA, 9th Edition, 2011.
5. Operations Research by H.A. Taha. Prentice-hall Inc. Englewood. Cliffs USA 4th Edition, 2011.
6. Mathematical Statistics. By Dr. J.E.Freund. Prentice-hall Inc. Englewood. Cliffs USA, 7th Edition. 2007.
7. Vector and Tensor Methods, by Chorlton, Ellis Horwood Publishers, 1976.
8. Elementary Vector Analysis. By Dr. Munawar Hussain. S.M. Hafeez. M.A. Saeed and Ch. Bashir Ahmed. The Caravan Book House, Kachhry Road, Lahore.
9. A Text Book of Fluid Dynamics by Chorlton, Van Nostrand Company Ltd. London, 1967.
10. Mechanics by O.K. Ghori. West Pakistan Publishing Company, Lahore (1971).

P

J. Jullana

202 5

General Mathematics

Paper -I

NOTE: Each section having 04 questions, please attempt any two questions from each section.

SECTION-I (4/12: 17,17,17,17)

Theory of limit and continuity. Solution of inequalities. Derivatives and its application to business, economics and physics etc. Differentials. Related rates. Newton-Raphson formula. Higher order derivatives. Leibnitz's theorem. Limits and continuity, of functions of two variables. Partial differentiation and its geometrical meaning for functions of two variables. Euler's theorem. Increments and differentials. Chain Rule. General theorems (without proofs) and indeterminate forms. *L' Hospital rule of functions. Increasing and decreasing functions.

SECTION-II (4/12: 16,16,16,16)

Translation and rotation of axes. Second degree equation with reference to conic section. Properties of conics. Polar equations of conics. Tangents and normals. Parametric representation of curves. Pedal Equations. Asymptotes. Extrema and its application. Singular points. Curvature. Evolutes and envelopes.

SECTION-III (4/12: 17,17,17,17)

Antiderivatives and indefinite integrals. Methods of integration. Definite integral as limit of sum. Fundamental theorem. Properties. Improper integrals. Reduction formulas. Double and Triple integral (Simple cases). Area between curves. Length of arc. Intrinsic equations. Numerical integration (rectangular, trapezoidal and 1/3 Simpson's rules). Co-ordinates in three dimension. Rectangular, cylindrical and spherical co-ordinates. Equations of plan, straight line, sphere, cylinder, cone, ellipsoid, hyperboloid and paraboloid. Longitude and latitudes. Spherical triangle and direction of Qibla.

Note: A student has to take B-course of Mathematics (both I & II papers) as an additional course to be eligible to do M.Sc. Mathematics as a regular or a private candidate.

Recommended Books

1. Calculus by H.Anton. John Wiley and Sons New York(Latest Edition).
2. Calculus By C.H Edwards and D.E. Penney. Prentice Hall. Inc (Latest Edition).
3. Calculus By S.I. Grossman. Academic Press Inc (Latest Edition).
4. Calculus and Analytic Geometry by S.M. Yousaf. Ilmi Kitab Khana. Urdu Bazar Lahore, 1998.
5. Calculus and analytic geometry by G.B Thomas and R.I. Finney. Adison-Wesley Publishing Company (Latest Edition).
6. Elementary Linear Algebra by C.H. Edwards. Jr and Davide penney. Prentice Hall international Inc, 1988.
7. Mathematical Techniques by K. H. Dar. Irfan-ul-Haq and M.A. Jajja. The Carvan Book House. Kachehry Road Lahore, 9th Edition 1997.
8. Mathematical Methods by S.M. Yousaf. Ilmi Kitab Khana. Urdu Bazar Lahore 2000.
9. Set Theory and Logic by Stoll. Robert R.S. Chand & Co. New Delhi.
10. Number Theory by Dr. Manzoor Hussain. The Carvan Book House, Kachehry Road, Lahore.
11. Elementary Linear Algebra .by Howard Anton And Chris. Rorres. John Willey & Sons. INC 10th Edition, 2010.

