



# AL- HAFEEZ COLLEGE, ARRAH

## ONLINE CLASSES

**MATHEMATICS LECTURES (PDF)**



### PRECAUTIONS FOR CORONA EPIDEMIC

- Clean your hand with soap or sanitizer.
- Maintain social distancing.
- Stay home if you feel unwell.
- Don't touch eyes, nose and mouth.
- Cover your nose and mouth with a tissue when you cough and sneeze.
- Follow the directions of your local health authority.

# Introduction class for B.sc Part 1 (Hon's) 2020-21



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Hi dear students as we know, we all are in critical situation from epidemic corona virus, due to lock down all college lectures are stopped for a time being by the government and directed to provide online lectures on college/ university portal. So, all college faculty members are engaging to prepare online materials to teach you online and we hope, you will complete the syllabus on time, therefore no need to worry **stay at home, stay safe**.

Today is introduction class in which we shall outline your syllabus and distribution of papers and marks for examination purpose. We shall given some useful important Books with author's name for self study. Some useful links, pdf of books will be provided time to time during study. We shall study whole syllabus one by one in further lectures of coming days.

During our study stress will be given on development of ideas and theory that is applicable for how to solve problem intelligently.

Now here is your entire syllabus watch out them before going to a serious lecture.

## SYLLABUS

**SET THEORY:** - General forms of Demorgan's laws. Generalized Cartesian product, Equivalence relation, Partial and total order relation.

Countable and uncountable sets, countability of real, rational, irrational and Algebraic number system, composition and factorization of mappings.

**TRIGONOMETRY:** - Hyperbolic functions, Resolution into factors, summation of series, summation by  $C + i S$  method only and Gregory's series.

**MATRICES** : - Symmetric and skew-symmetric matrices, Hermitian and skew- Hermitian matrices, Transpose of a matrix, Adjoint and invrse of matrix, Orthogonal matrices, Rank of a matrix.

**LINEAR PROGRAMMING** : - convex set and their properties, Linear Programming Problems and their graphical solutions, Theory of simplex method and their simple applications. Transportation problem, Assignment problems.

**THEORY OF EQUATIONS** : - Fundamental theorem of Algebra, Relation between roots and coefficient of a Polynomial equations. Evaluation of symmetric function of roots, Cardan's solution of a cubic, Euler's solution of a bi-quadratic equation. Descartes rule of sign.

**DIFFERENTIAL CALCULUS** : - successive differentiation, Leibnitz's theorem, Partial differentiation, Euler's theorem, Exact differential, Indeterminate form, L'Hospital's rule, Maclaurin's series expansion, Tangents and Normals, Curvature, Asymptotes.

**INTEGRAL CALCULUS** : - Integration of rational and irrational function, Notion of integral as limit of a sum, Evaluation of definite integrals, Reduction formulae, Curve tracing, Areas of Curves, Length of curve, Volumes and surface area of solids of revolution, Moment of Inertia, Centre of gravity.

**ANALYTICAL GEOMETRY OF TWO DIMENSIONS** : - System of circles, Change of axes, Condition for the general equation of second degree to represent a parabola, Ellipse, and Hyperbola. Equation of tangents and normal in the case of general equation of second degree via calculus and their forms in particular cases. Chord of contact, Polar line and pair of tangents. Polar equation of conic section, Tangents and Normals in polar form.

**ANALYTICAL GEOMETRY OF THREE DIMENSIONS** : - Rectangular, spherical, Polar and Cylindrical Co-ordinates, Angle between straight lines, Equation of Planes and lines, Shortest distance between skew lines. Sphere, Cone and cylinder, standard equation of conicoids, Normals and conjugate diameters of an ellipsoid.

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Now the whole syllabus is divided into the two papers each contains equally 100 marks with stipulated time of 3 hours.

For your better understanding I have given chapter wise marks distribution for each paper with conditional grouping to opt at least one question from each group which is summarized in below table.

**Paper- 1 (100 Marks.)**  
**Timing- 3 Hours**

S.N	Grouping	Chapters	No. of Ques. asked	No. of Ques. to answer	Marks distribution
01	Multiple choice objective ques.	All chapters from below	10 ques.	10	$10 \times 2 = 20$
02	Group A	Set theory Trigonometry	2 ques. 2 ques.	Ans. to 5 ques. by selecting at least one ques. from each group.	$5 \times 16 = 80$
03	Group B	Matrices Linear Programming	2 ques. 2 ques.		Total = 100
04	Group C	Theory of equations	3 ques.		

**Paper- 2 (100 Marks.)**

**Timing- 3 Hours**

S.N	Grouping	Chapters	No. of Ques. asked	No. of Ques. to answer	Marks distribution
01	Multiple choice objective ques.	All chapters from below	10 ques.	10	$10 \times 2 = 20$
02	Group A	Differential Calculus	3 ques.	Ans. to 5 ques. by selecting at least one ques. from each group.	$5 \times 16 = 80$
03	Group B	Integral Calculus	3 ques.		Total = 100
04	Group C	Analytical geometry of two dimensions	2 ques.		
05	Group D	Analytical geometry of three dimensions	3 ques.		

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At the last, some useful books list covering entire syllabus is providing here for your self practice of problems because more practice makes you more perfect.

**BOOKLIST**

S.N	NAME OF BOOKS	NAME OF AUTHORS & PUBLICATION
01	Set Theory	a) Lalji Prasad, Paramount pub. b) M.L. khanna, Krishna pub.
02	Degree level Trigonometry	a) S.L. Loney, S.chand pub. b) Lalji Prasad, Paramount pub
03	Matrices	a) Shanti Narayan, S. Chand pub. b) Lalji Prasad, Paramount pub c) M.L. khanna, Krishna pub
04	Linear Programming	a) Lalji Prasad, Paramount pub. b) B.N. Mishra & Mishra, ANE pub.
05	Theory of Equations	a) M.L. khanna, Krishna pub. b) Lalji Prasad, Paramount pub.
06	Differential Calculus	a) Dasgupta & Prasad, Bharti bhawan pub. b) Shanti Narayan, S. Chand pub.
07	Integral Calculus	a) Shanti Narayan, S. Chand pub. b) Lalji Prasad, Paramount pub.
08	Analytical Geometry of two dimensions	a) Dasgupta & Prasad, Bharti bhawan pub. b) Lalji Prasad, Paramount pub c) S.L. Loney, S.chand pub
09	Analytical Geometry of three dimensions	a) M.L. khanna, Krishna pub. b) B.S. Teyagi, S.Chand pub.

**Ok thank all of you, we will meet again in next Set Theory lectures.**

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