W.e.f. 2000-2001 AB

SYLLABU

Sx-S304.

M-304 NUMBER THEORY

UNIT-I

ARITHMETICAL FUNCTIONS AND DIRICHLET MULTIPLICATION:-

Introduction - The Mobius function $\mu(n)$ - TheEuler totient function $\phi(n)$ - A relation connecting ϕ and μ - Aproduct formula for $\phi(n)$ - The Dirichlet product of arithmetical functions -Dirichlet inverses and the Mobius inversion formula - The Mangoldt function $\Lambda(n)$ The Multiplicative functions - Multiplicative functions and Dirichlet multiplication - The inverse of a completely multiplicative function - Liouville's function $\lambda(n)$ - The divisor functions $\sigma_\alpha(n)$.

Chapter-2: Articles 2.1 to 2.13.

UNIT-II

AVERAGES OF ARITHMETICAL FUNCTIONS:

Introduction - The big oh notation. Asymptotic equality of functions - Euler's summation formula - Some elementary asymptotic formulas - The average order of $\tau(n)$ - The average order of the divisor functions $\sigma_\alpha(n)$ - The average order of $\phi(n)$ - An application to the distribution of lattice points visible from the origin - The average order of $\mu(n)$ and of $\Lambda(n)$ - The partial sums of a Dirichlet product - Applications to $\mu(n)$ and $\lambda(n)$ - Another identity for the partial sums of a Dirichlet product.

Chapter-3: Articles 3.1 to 3.12.

UNIT-III

SOME ELEMENTARY THEOREMS ON THE DISTRIBUTION OF PRIME NUMBERS

Introduction - Chebyshev's functions $\psi(x)$ and $\theta(x)$ - Relations connecting $\theta(x)$ and $\pi(x)$ - Some equivalent forms of the prime number theorem - Inequalities for $\pi(n)$ and p_n - Shapiro's Tauberian theorem - Applications of Shapiro's theorem - An asymptotic formula for the partial sums $\sum \frac{1}{p}$ The partial sums of the Mobius function - Selberg's asymptotic formula.

Chapter-4: Articles 4.1 to 4.9 and 4.11

UNIT-IV

CONGRUENCES: Definition and basic properties of congruences - Residue classes and complete residue systems - Linear congruences - Reduced residue systems and the Euler-Fermat theorem - Polynomial congruences modulo p. Lagrange's theorem - Applications of Lagrange's theorem - Simultaneous linear congruences. The Chinese remainder theorem.

Chapter 5 - Articles 5.1 to 5.7

*PLEASE SET TWO DIFFERENT

Contd...4