FOR THE POST OF RESEARCH OFFICER AND
RESEARCH ASSISTANT IN THE OFFICE OF THE COMMISSION
STATISTICS AND COMPUTER SCIENCE
(PG DEGREE STANDARD)

SUBJECT CODE: 307

STATISTICS

UNIT – I: PROBABILITY THEORY AND DISTRIBUTIONS
Sample space and events, Probability measures and probability space-Random variables, Discrete and Continuous random variable, probability density and distribution functions. Simple theorems on Probability. Marginal and conditional distribution, Expectations and moments, Independence of events, Moments and Cumulants generating functions.

Discrete Uniform Binomial, Multinomial, Poisson, Negative – Binomial, Hypergeometric Distributions. Uniform, Normal, Cauchy, Beta, Gamma, Log Normal, Exponential, Weibull distributions, Chi square, t and F distributions.

UNIT – II: STATISTICS INFERENCEN

Simple and Composite Hypothesis, two kinds of error, power functions, most powerful test, Neyman – Pearson Lemma UMP and unbiased test, MLR property and its use for construction of UMP tests, Likelihood ratio test, confidence intervals for large and small samples.

Run test for Randomness, Median test, sign test for location, Wilcoxon – Mann Whitney U – test and Kolmogrov – Smirnov tests.
UNIT – III: LINEAR MODELS AND DESIGN OF EXPERIMENTS

Theory of Least squares, classification of linear models, Best linear unbiased estimators (BLUE) for Gauss – Markov Conditions – Estimable functions, Test of linear hypothesis and its applications to ANOVA, Regression diagnostics.

Principles, CRD, RBD, LSD, RBD with many observations per cell, missing plot technique, fractional experiments 2” and 3” design. General theory of partial Confounding and fractional replication, analysis of Split plot, BIBD and PBIBD.

UNIT – IV: MULTIVARIATE ANALYSIS


UNIT – V: SAMPLING THEORY

Simple random sampling systematic and stratified sampling, PPSWR and PPSWOR methods of sampling, Hansen-Hurwitz, ordered and unordered estimators, Ratio and Regression estimates, Double sampling, Cluster sampling, Two stage and Multistage sampling Multi-phase sampling. Sampling and Non-Sampling errors. Randomized response techniques Organization of sample surveys, Sample survey organisation – CSO and NSSO.

UNIT – VI: STOCHASTIC PROCESSES AND OPERATIONS RESEARCH

Linear Programming-Simplex procedure, Transportation and Assignment problems, Duality, Dual simplex, Game Theory, Single and Multi period inventory Models, Queuing Models – Waiting time distributions of M/M/1, M/M/D Models with different service policy, Service time distributions.

UNIT – VII: STATISTICAL QUALITY CONTROL

Concepts of quality and meaning of Control, Different types of Control Charts like X bar, R, p and np charts and their uses. CUSUM chart. Sampling inspection Vs 100 percent inspection, single, double, multiple and sequential plans for attributes. Variable sampling plan. The OC, ASN, ATI and AOQ Curves, concept of producer’s risk and consumer’s risk, AQL, LTPD, AOQL, IQL, MAPD and MAOOQ.

COMPUTER SCIENCE

UNIT- VIII: FUNDAMENTALS OF COMPUTING


UNIT - IX: OFFICE MANAGEMENT TOOLS

**MS-Word:** Introduction to MS-Word and User Utilities - Exploring Template and Formation of Documents - Table handling - Mail Merge and Print Process.

**MS-Excel:** Spreadsheet - Workbook window - Formatting Cells / Worksheet - Working with Formula, Function and Charts - Filtering Data and Printing a Presentation.

**MS-Power Point:** Introduction to MS-Power Point - Creating Templates - Font and color editing - Adding Multimedia effects.

UNIT – X: PROGRAMMING C


Dated: 19.09.2017
FOR THE POST OF RESEARCH OFFICER AND
RESEARCH ASSISTANT IN THE OFFICE OF THE COMMISSION

MATHEMATICS AND ECONOMICS

(PG DEGREE STANDARD)

SUBJECT CODE: 308

MATHEMATICS

UNIT – I: ALGEBRA


UNIT – II: REAL ANALYSIS


UNIT – III: COMPLEX ANALYSIS

UNIT – IV: TOPOLOGY AND FUNCTIONAL ANALYSIS

Topological spaces & continuous functions, metric topology, Connectedness, compactness, countability and separation axiom, Fundamental group and covering spaces.
Fundamentals of normed Linear spaces, bounded Linear maps on Banach spaces, open mapping theorem, converse of Reimann Lebsegue Lemma, spaces of bounded linear maps, weak and weak convergence, compact linear maps, geometry of Hilbert space, Approximation and optimisation, Bounded operators of Hilbert spares, spectrum of bounded operators on Hilbert spaces.

UNIT – V: DIFFERENTIAL EQUATIONS

Linear differential equations of higher order - Linear dependence and Wronskian basic theory - solutions in power series - Introduction to second order linear equations with ordinary points. Legendre equations and legender polynomial, Second order equations with regular singular points, Bessel equations. Partial differential equations; first order, complete Integral, general Integral, singular Integral, Compatible systems of first order equation, charpit's method. Partial differential equations of second order - Linear and partial equations with constant co-efficients Laplace equation - Elementary solutions of Laplace equation.

ECONOMICS

UNIT – VI

Theory of production: Iso-quants – Producer's equilibrium- Production function – Types of Production function- optimum factor combination - Price and output determination under different market structures – Producer's Surplus.
UNIT - VII

UNIT - VIII

UNIT - IX
Fiscal Function - Direct and Indirect taxes - Public Expenditure - Public borrowing - techniques - Debt management - Fiscal Federalism - Fiscal policy – Compensatory and Functional finance - Types of budget - Budget formulation - Centre and State Financial Relations in India.

UNIT – X
FOR THE POST OF RESEARCH OFFICER AND
RESEARCH ASSISTANT IN THE OFFICE OF THE COMMISSION

GENERAL STUDIES
(DEGREE STANDARD)

TOPICS FOR OBJECTIVE TYPE

 SUBJECT CODE: 309

UNIT – I: General Science


Chemistry - Elements and Compounds-Acids, bases and salts - Oxidation and reduction - Chemistry of ores and metals -Carbon, nitrogen and their compounds- Fertilizers, pesticides, insecticides-Biochemistry and biotechnology-Electrochemistry- Polymers and plastics.

Botany - Main Concepts of life science-The cell-basic unit of life-Classification of living organism-Nutrition and dietetics-Respiration-Excretion of metabolic waste-Bio-communication.

Zoology - Blood and blood circulation-Endocrine system-Reproductive system-Genetics the science of heredity-Environment, ecology, health and hygiene, Biodiversity and its conservation-Human diseases, prevention and remedies-Communicable diseases and non- communicable diseases-Alcoholism and drug abuse-Animals, plants and human life.

UNIT - II: Current Events

Political Science - India's foreign policy - Latest court verdicts – public opinion - Problems in conduct of public elections- Political parties and political system in India- Public awareness & General administration- Role of Voluntary organizations & Gov't.- Welfare oriented govt. schemes, their utility.

Geography - Geographical landmarks-Policy on environment and ecology.

Economics- Current socio-economic problems-New economic policy & Govt. sector.


UNIT – IV: History and culture of India - Pre-historic events - Indus valley civilization - Vedic, Aryan and Sangam age - Maurya dynasty - Buddhism and Jainism - Guptas, Delhi Sultans, Mughals and Marathas - Age of Vijayanagaram and the bahmanis - South Indian history - Culture and Heritage of Tamil people- Advent of European invasion - Expansion and consolidation of British rule - Effect of British rule on socio-economic factors - Social reforms and religious movements - India since independence - Characteristics of Indian culture - Unity in diversity – race, colour, language, custom - India as secular state - Organizations for fine arts, dance, drama, music - Growth of rationalist, Dravidian movement in TN - Political parties and populist schemes – Prominent personalities in the various spheres – Arts, Science, literature and Philosophy – Mother Teresa, Swami Vivekananda, Pandit Ravishankar, M.S.Subbulakshmi, Rukmani Arundel and J.Krishnamoorthy etc.

UNIT – V: INDIAN POLITY - Constitution of India - Preamble to the constitution - Salient features of constitution - Union, State and territory - Citizenship - rights amend duties - Fundamental rights - Fundamental duties - Human rights charter - Union legislature – Parliament - State executive - State Legislature – assembly - Status of


UNIT – VIII : APTITUDE & MENTAL ABILITY TEST - Conversion of information to data - Collection, compilation and presentation of data - Tables, graphs, diagrams- Parametric representation of data-Analytical interpretation of data -Simplification- Percentage-Highest Common Factor (HCF)-Lowest Common Multiple (LCM)-Ratio and
Proportion-Simple interest-Compound interest-Area-Volume-Time and Work-Behavioral ability - Basic terms, Communications in information technology - Application of Information and Communication Technology (ICT) - Decision making and problem solving.

**Logical Reasoning:** Puzzles – Dice - Visual Reasoning- Alpha numeric Reasoning- Number Series - Logical Number/Alphabetical/Diagrammatic Sequences.

....