IIMB FPM 2019 **ESS AREA TEST SYLLABUS**

The candidates will have to appear for a test in Microeconomics, Mathematics and Statistics. The questions will be a combination of multiple choice questions and problems. In addition, selected candidates may be asked to study a journal paper for discussion.

Syllabus for Microeconomics:

1. Markets, Demand and Supply, Equilibrium, Comparative Statics, Elasticity, Taxes and Subsidies, Consumer and Producer Surplus
2. Consumer Behaviour, Indifference Curves, Utility functions, Budget constraints, Consumer choice, Income and Substitution Effects
3. Production Functions, Average and Marginal Product, Law of Diminishing Returns, Choice of inputs, Economies of scale
4. Cost of production, Opportunity cost, different types of costs, Cost minimization, Long-run vs. Short Run Cost Curves
5. Perfect Competition, Monopoly and Monopolistic Competition, Pricing with Monopoly Power
6. Bertrand, Cournot and Stackelberg Oligopoly
7. Game Theory, Equilibrium in Dominant Strategies, Nash Equilibrium, Repeated Games, Sequential Games
8. General Equilibrium and Economics Efficiency, Efficiency in Exchange, Efficiency in Production
9. Asymmetric Information, Adverse Selection and Moral Hazard
10. Externalities and Public Goods

Syllabus for Mathematics:

1. Binomial Theorem, AP, GP Series, Permutations and Combinations, Theory of Polynomial equations
2. Elementary set theory
3. Matrix algebra, rank and inverse of matrices, systems of linear equations, determinants, and Eigen values
4. Functions of one and two variables: Limits, continuity, differentiation, Definite and Indefinite Integrals: Integration by parts and integration by substitution
5. Constrained and unconstrained optimization of not more than two variables, homogenous and homothetic functions, convexity of sets, concavity and convexity of functions.

Syllabus for Statistics:

1. *Descriptive statistics* (e.g. graphical methods, measures of central tendency, dispersion, correlation, partial correlation, histogram, density plots etc.)
2. *Probability theory* (e.g. sets and events, conditional probability, statistical independence etc.)
3. *Distribution theory* (e.g. discrete and continuous random variables, probability mass functions (PMFs), probability density functions (PDFs), cumulative distribution functions (CDFs), expectations, joint and conditional distributions, transformations of random variables etc.)
4. *Sampling* (e.g. statistic, independent and identically distributed sample, sampling distributions etc.)
5. *Estimation, hypothesis tests and inference* (e.g. estimators, unbiasedness, consistency, hypothesis tests, confidence intervals etc.)
6. *Law of large numbers and central limit theorems*.