

**INDIAN INSTITUTE OF MANAGEMENT UDAIPUR**  
**PhD – Operations Management Selection Process 2020**

There shall be 2 stages in the selection process:

Stage 1: Screening of Applications

Stage 2: Research Aptitude Test + Personal Interview

**Screening of Applications:**

After screening of all applicants, only shortlisted applicants shall be called upon in person for Research Aptitude Test and Personal Interview.

**Breakdown of OM-RAT (Research Aptitude Test)**

**1. Mathematics (20%)**

Algebra: Arithmetic; geometric and harmonic progressions; permutations and combinations; binomial theorem; elementary set theory; functions and relations; matrix algebra; systems of linear equations; eigenvalues and eigenvectors.

Calculus: Functions of single variable; limit, continuity and differentiability; mean value theorems; evaluation of definite and improper integrals; partial derivatives; total derivatives; maxima and minima.

Differential equations: First order equations (linear and nonlinear); higher order linear differential equations with constant coefficients; Cauchy's and Euler's equations; initial and boundary value problems; Laplace transforms.

**2. Probability and Statistics (20%)**

Descriptive statistics: Graphical representation of data (histogram, pie chart, bar chart); measures of central tendency – mean, median, mode; measures of dispersion – standard deviation, coefficient of variation.

Probability and random variables: Definitions of probability, conditional probability and Bayes theorem; random variables, Poisson, normal and binomial distributions; sampling theorems.

**3. Operations Research (10%)**

Linear programming: Problem formulation; simplex method; duality and sensitivity analysis; transportation and assignment models; network flow models; simple queuing models.

**4. Research Paper study and analysis (50%)**

Candidates shortlisted to appear for the written test and interview will get three research papers well in advance. A candidate should select one from those for study. (S)he will have to answer questions based on the chosen paper in the written test. The questions are aimed at testing the candidate's writing skill, communication skill, critical thinking ability, and overall research aptitude. The candidate will also be asked questions in the interview from his/her chosen research paper.