

JRF (Quality, Reliability & Operations Research):2017

INDIAN STATISTICAL INSTITUTE INSTRUCTIONS

The test is divided into two sessions (i) Forenoon session and (ii) Afternoon session. Each session is for two hours. For the forenoon session question paper, the test code is **MMA** and for the afternoon session question paper, the test code is **QRB**. Candidates appearing for JRF (QROR) should verify and ensure that they are answering the right question paper.

The test **QRB** is of short answer type. It has two groups. A candidate has to answer **two** of the **four** questions from Group A and **three** of the **eight** questions from Group B.

OUTLINE OF THE SYLLABUS FOR QRB

The syllabus for JRF (QROR) will include the following subject groups:

1 Group A

- i) Mathematics
- ii) Statistics (including Probability)

2 Group B

- i) Operations Research
- ii) Quality Management
- iii) Reliability
- iv) Statistical Quality Control

A broad coverage for each of the above subject groups is given below.

- A. **Mathematics:** Algebra, Calculus, Set theory, Vectors and matrices (all at B.Sc. level).
- B. **Statistics:** Elementary probability and distribution theory, Bivariate distributions, Multivariate normal distribution, Regression and linear models, Estimation, Test of hypothesis, Design of experiments (block design, full and fractional factorial designs), Markov chain.
- C. **Operations Research:** Linear programming (basic theory, simplex algorithm and its variants, duality theory, transportation and assignment problem), Non-linear programming-basic theory, Game theory (two person zero-sum game).
- D. **Quality Management :** Quality concepts, Quality costs, Total Quality Management, Six Sigma.
- E. **Reliability:** Coherent systems and system reliability, Hazard function, Failure time distribution, Censoring schemes, Estimation and testing in reliability, Replacement models, Repairable system.
- F. **Statistical Quality Control:** Statistical process control - attribute and variable control charts, Control chart with memory (CUSUM, EWMA etc.) (univariate only), Multivariate control chart, Process capability analysis, QC tools, Acceptance sampling.