Institute of Actuaries of India
Statutory body established under an Act of Parliament

Unit No. F-206, 2nd Floor, F Wing, Tower II, Seawoods Grand Central,
Plot no R-1, Sector 40, Nerul Road, Navi Mumbai - 400706
+91 22 6243 3333 +91 22 6243 3322

Institute of Actuaries of India

9th April, 2019

CS1 and CS2 Guide

Introduction to Actuarial Statistics (CS1 and CS2)

This guide should help answer your questions about CS1 and CS2, including:

- the format of the online examinations;
- guidance on how to take the examinations;
- administrative information; and
- technical information.

If you have any further questions that are not covered in this guide, please contact the Examination department: jyoti@actuariesindia.org

What is covered in CS1 and CS2?

Subjects CS1 and CS2 are a fundamental part of the Core Principle subjects.

CS1 provides a grounding in mathematical and statistical methods that are of relevance to actuarial work. It will equip you with the knowledge of:
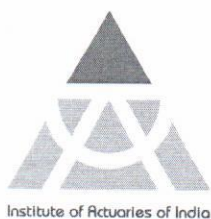
- statistical distributions,
- methods to summarise data,
- the principles of statistical inference, regression models (including generalized linear models) and
- the fundamental concepts of Bayesian statistics, etc.

CS2 builds upon CS1. It develops knowledge of and the ability to apply:

- statistical methods for risk modelling,
- time series analysis methods,
- stochastic processes (especially Markov chains and Markov jump processes),
- survival analysis (including regression methods applied to duration data) and
- graduation methods, etc.

It also includes a high level introduction to machine learning.

Subjects CS1 and CS2 include both theory and application of the ideas using the 'R' statistical package.

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What is the format of the CS examinations?

Details of the syllabus for CS1 and CS2 has been uploaded on IAI website. Questions for the CS1 examination and the CS2 examination will be drawn from across the syllabus.

Each of the CS1 and CS2 examination consists of two elements, Paper 'A' and Paper 'B':

- **Paper A:** 3 hrs and 15 mins written examination paper.
- **Paper B**: 1 hour and 45 mins computer based examination. This is a problem based assessment, using 'R' with questions requiring Candidates to use data to answer questions. Candidates will need to be confident in the use of statistical package 'R'. R and R Studio and other required packages will be pre-loaded and provided to candidates at the time of examination.

Both these papers will be conducted at designated examination centres only.

For the examinations, you will be provided access to the following.

- **Version of R:** 3.5.3 or any other higher version
- **Version of R Studio:** 1.1.463 or any other higher version
- **Packages:** base, stats, utils, graphics, Fpp, Markov Chain, forecast, dplyr, readxl, psych, corrplot, flexsurv, survival

What examinations should I have passed before sitting CS1 and CS2?

There are no pre-requisite requirements for CS1 or CS2. However the syllabus for CS1 lists a number of foundation topics such as summarizing data sets, basic probability theory and random variables. These topics are assumed knowledge for CS1 and you may wish to ensure you are familiar with them before studying for CS1. Furthermore because CS2 builds on many of the principles covered in CS1, you may wish to ensure you are familiar with the topics covered in CS1 before studying CS2.

Candidates are informed that required Formulae and Tables books will be made available in examination centres for both the papers.

Professional conduct during the CS Examinations:

It is important to note that professional conduct is required at all times and the following will apply:

- Inappropriate behaviour during the CS examinations may lead to expulsion from the examination, with disciplinary consequences.
- You are not permitted to use electronic material that has been pre-prepared or copied in your examination submission (for example, pre-prepared Word or Excel documents).

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For the online examinations your attention is drawn to:

- Online examinations will be conducted in classroom environment under the supervision of an invigilator.
- Internet access shall be restricted during the examination period.
- All required data will normally be supplied electronically at the start of the examination time.
- Candidates must not use an imported e-template unless provided as part of the examination material.
- In case of technical glitch, Institute will not be responsible for retrieval of data. Institute will make best possible efforts for data retrieval and students will have to re-appear in next examination.
- The examination will be time based test of 1 hour and 45 minutes duration and will automatically close after the specified time period. The work done by the candidate till that time will automatically get submitted in the provided platform.
- Examination submissions will only be accepted in the specified file format e.g. If MS Word is specified then PDF submissions will not be accepted.

Dinesh Chandra Khansili
Executive Director