Exam Tips

Rough Marks Guidelines

Exam contains 6 questions: total of 150 marks, probably to be scaled out of around 140. Therefore:

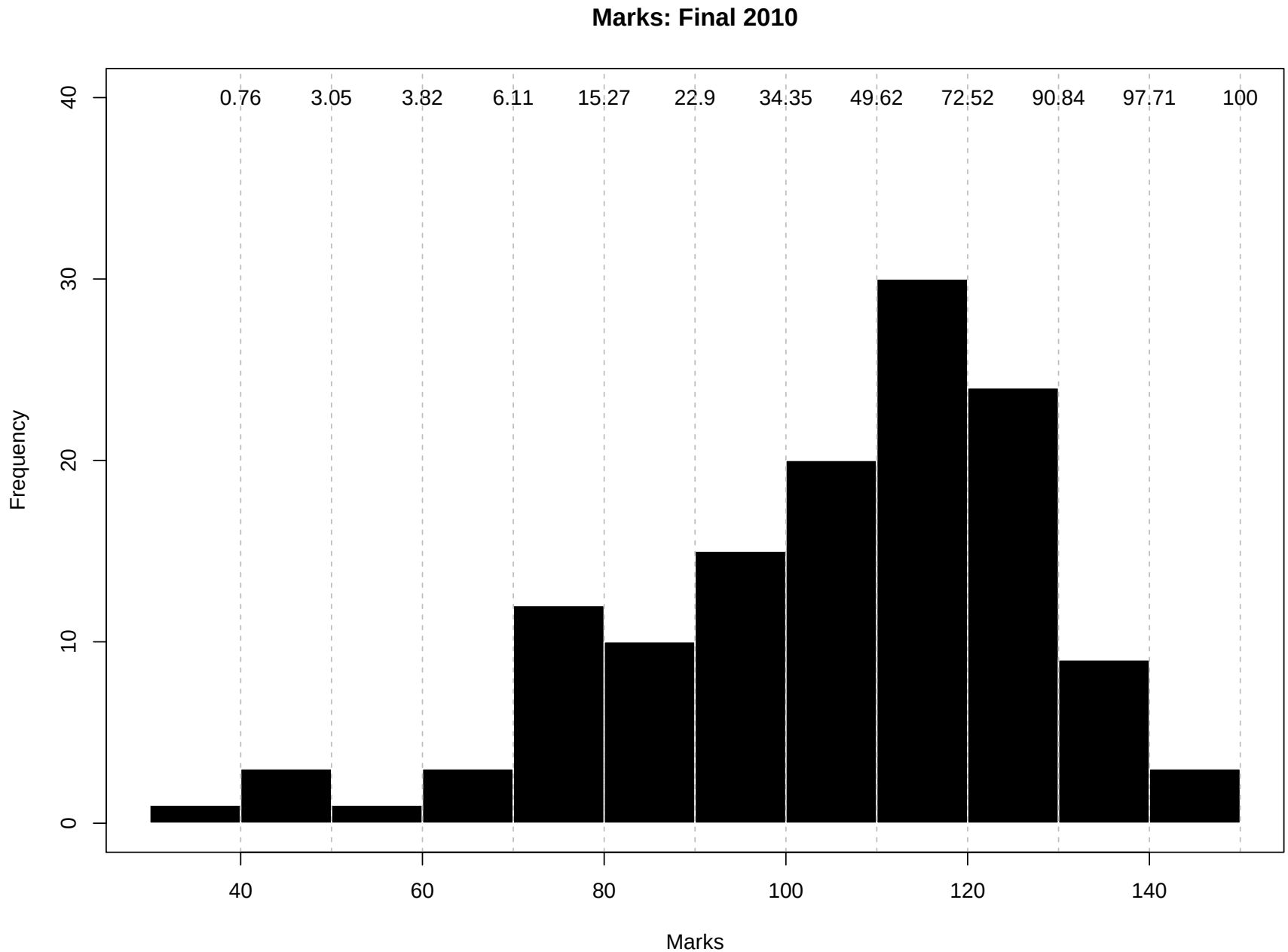
- 5 out of 6 complete answers : 125/140 yields 89.3 % (A†)
- 4 out of 6 complete answers : 100/140 yields 71.4 % (B†)

† *excluding coursework/mid-term marks.*

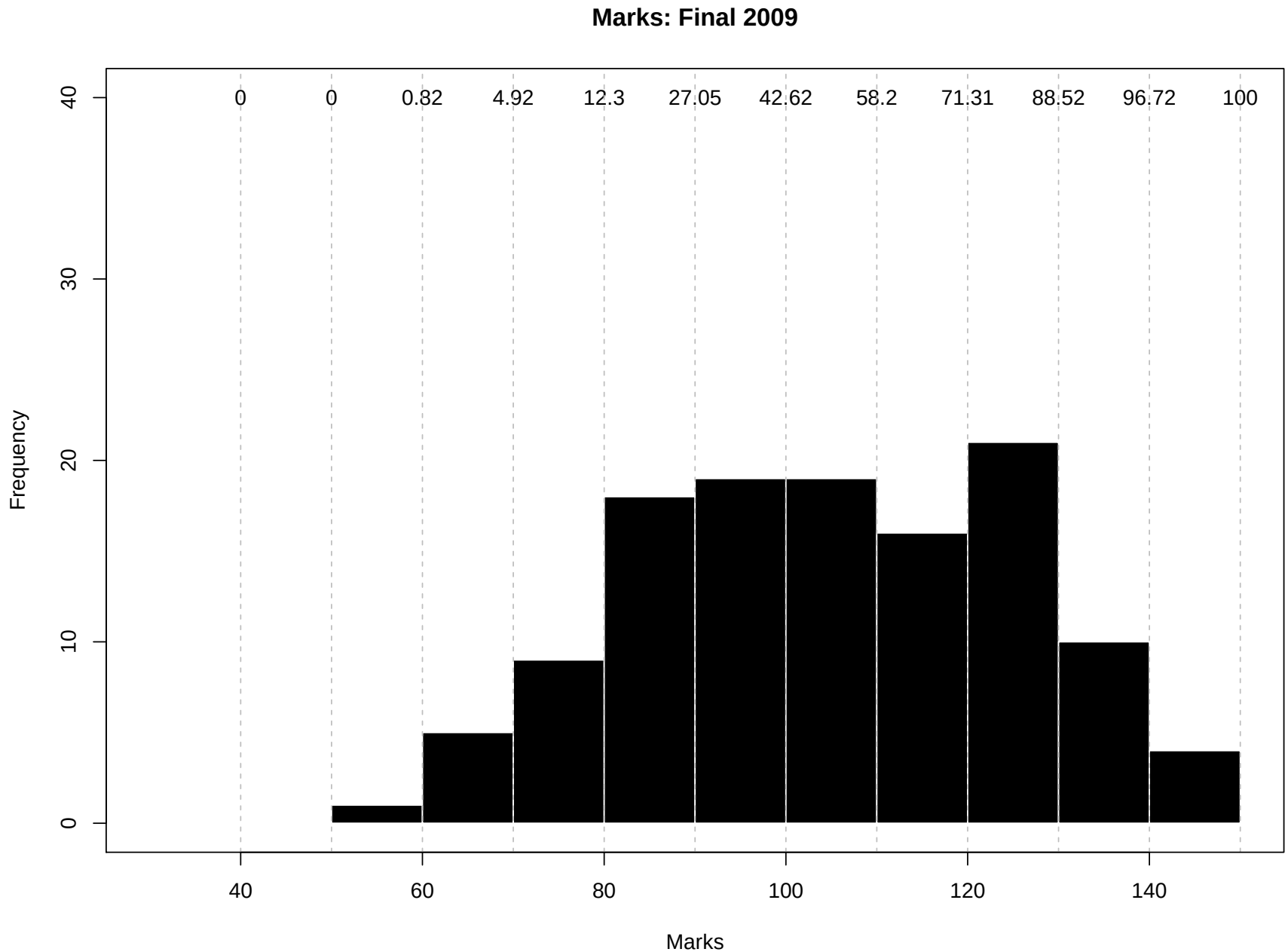
I would expect most scripts to be in this range: however, given past experiences marks tend to be a little higher, with around 30 % of the class getting scores higher than 125

Course, method of assessment and exam are similar to the last two years ...

Marks from 2010



Marks from 2009



Advice

1. Know the syllabus

- Course Structure
- Definitions
- Key Techniques
- Named tests

Part 1

ANALYSIS OF VARIANCE

1. Designed Experiments
2. Randomized Designs
3. Multiple Comparison of Means
4. Randomized Block Designs
5. Factorial Experiments

eg ANOVA F-tests, main effects and interactions, balance, completeness, parameter estimation, prediction, model assumptions.

Part 2

LINEAR REGRESSION MODELLING One Covariate:

1. Probability Models
2. Least-Squares Fitting
3. Model Assumptions
4. Parameter Estimation and Testing
5. The Correlation Coefficient
6. Prediction
7. Polynomial Regression

eg Parameter estimation, prediction, goodness of fit measures, residual checking, model assumptions.

Part 2

LINEAR REGRESSION MODELLING Multiple Covariates:

1. Multiple Regression Models
2. Model Building and Checking
3. Stepwise Model Selection
4. Residual Analysis
5. Pitfalls of Regression Modelling

eg Covariates and factor predictors, parameter estimation, goodness of fit measures, residual checking, model assumptions, ANOVA F-test for model selection.

Part 3

NON-PARAMETRIC STATISTICS

1. Distribution-Free Tests
2. Single Population Tests
3. Comparing Two Populations: Independent Samples
4. Comparing Two Populations: Dependent Samples
5. Comparing Three or More Populations
6. Rank Correlation
7. Simulation-based Testing: Permutation Tests

eg Chi-squared tests, tests for 2×2 tables, discrete null distributions for small sample tests, asymptotic (large sample) tests.

Advice

2. Understand basic statistical ideas

- Terminology
- Testing Procedures
- p-values
- Significance Levels (α)
- Parameter estimates
- Types of experimental design and statistical model
- Use of statistical tables
  - Fisher-F, Chi-squared, Normal
  - Discrete distributions: binomial, tables for small sample non-parametric tests

Advice

3. Your formula sheet

- You **will** be given all the complicated formulae
- You **will not** be given simple formulae: for example
  - sum-of-squares decompositions (eg SS = SST + SSE etc) and terms that appear in the ANOVA tables eg

$$\text{MST} = \frac{\text{SST}}{k-1} \qquad \text{MSE} = \frac{\text{SSE}}{n-k} \qquad F = \frac{\text{MST}}{\text{MSE}}$$

  - Chi-squared statistic for goodness of fit
  - estimated odds ratio for 2×2 table

etc.

Advice

4. `R` Output

- Know how to read the `R` output
- Know how to complete a statistical analysis
  - extract the necessary information (sums of squares, p-values etc) from the `R` ANOVA table
  - perform ANOVA-F tests for nested models
  - identify SSE quantities
  - identify significant coefficients
  - combine parameter estimates to get predictions

Advice

5. Exam tactics

- Read over the paper
- Try to establish what each question is asking
- Don't necessarily answer Q1, Q2, etc in sequence
- Pick off the easy marks first
- Write succinct answers
- Write neatly, or at least neatly enough so I can read it ...
- Check your numerical answers
- Manage your time properly

Advice

6. Have confidence

- Three hours is a long time ...