Exam History of Science

Date: Wednesday March 28, 2018	Lecturer: dr. D.J. Beckers
Time: 15:15 – 17:15u	Course code: FEW X 400652

In general:

1. Make sure your name and student number are on ALL your work.
2. Answer in English sentences. Spelling and grammar should be correct, either to the English or to the US standards. Just a few buzzwords never constitute an answer. Always explain yourself. Use appropriate examples to illustrate your answer.
3. This exam consists of 12 A-questions and 8 B-questions. The A-questions are about the lectures and the texts. The B-questions require you to reflect on the information from the lectures and texts, and / or information you might know from other sources.
4. You pick eight question: 5 A-questions and 3 B-questions. Each question is worth 1 point (or nothing!). Indicate clearly which questions you're answering by mentioning either the number and / or the title of the question in your answer. If you answer more than five A-questions, only the first five will be considered. Likewise for the B-questions.

A-questions

1. Achilles and the tortoise

In what ways does the paradox of Achilles and the tortoise illustrate the ancient Greek philosophers' stance towards movement?

2. Euclid

Explain Euclid's proof of *The Elements*, corollary XIII.18. Why was this interesting to him?

3. Cartography

Changes in the status of mathematics in late medieval Europe may be illustrated by changes in cartography. Explain this statement.

4. Nicole Oresme

Describe one of the mathematical results by Oresme. To what extent was Oresme a typical medieval academic?

5. Regula coss

Adam Ries and Robert Recorde both introduced the Regula coss in their textbooks. What was the idea of this rule, and why was it considered worthwhile?

6. Gardening

How does Volker Remmert explain the use of mathematics in 17th century gardening?

7. Applied mathematics

During the early nineteenth century the ideas about applying mathematics changed. Describe this change and the societal forces behind it.

8. Weierstrass
During the lecture, Karl Weierstrass (1815-1897) was mentioned as an advocate of epsilontics, completely and meticulously in line with the ideas of the time. Explain this statement.

9. Insurances and governement
Explain how, during the nineteenth century, the common interest of national governments and insurance companies, resulted in a cultural revolution, regarding the ideas about applying probability theory and statistics.

10. Alan Turing (1912-1954)
To what extent was Turings paper “On computable numbers” (1936) a description of an early computer?

11. Foundation
In his *Foundation* trilogy (1951-1953) the science fiction author Isaac Asimov illustrates the high hopes for probability theory shortly after World War II. Explain this statement.

12. Algol
Describe David Nofre's view on the polarity between Algol and Fortran.

B-questions:

1. Theorem
What is the difference between a statement and a mathematical theorem?

2. Geometry
A number of times, in history, the notion of "geometry" has changed, or at least, what people thought was the most valuable in geometry, changed. This may be illustrated by changes in the language of geometry books. Describe one of these changes and explain the relation with societal changes at the time.

3. Metric system
Reflect on the difficulty of the metric system

4. Analysis en calculus
What is the difference between analysis and calculus?

5. Dutch healthcare
During the lecture, it was argued that Dutch healthcare policy was influenced by data analysis. In what sense is statistics (or mathematicians, or a way to view numbers) supportive of that new view on how to finance healthcare?

6. Gambling
What is the connection between probability theory and gambling?

7. Applied mathematics
Can mathematics be applied?

8. Digital culture
Wat is the impact of computers on our culture?