Topics in CS Final Exam Question Study Guide

Exam format:

This exam is scored out of 50.

There will be 3 short-answer general-knowledge questions from the second half of the lectures/course notes, 2 points each (6 points total, 12% of marks). These cover vision, rate coding, Leaky Integrate-and-Fire (LIF), and numerical and mathematical conductance-based models including Hodgkin–Huxley.

There will be 2 in-depth questions worth 22 marks each and ***both*** must be completed (44% of marks each, or 88% of marks total). These cover:

- Deep knowledge of the Leaky Integrate and Fire model, its physiological interpretations, and mathematics as worked in the lecture slides, coursework, and course notes.
- Deep knowledge of the Hodgkin–Huxley model, its physiological interpretations, and mathematics as worked in the lecture slides, coursework, and course notes.

The maths required to complete (1) and (2) are relatively stereotyped, but will be asked in a way you haven't seen before. For full marks, you should also be able to point to any variable or term in either model and describe in words how it (allegedly) captures some aspect of physiological voltage dynamics. The posted slides for LIF and Hodgkin Huxley in particular highlight the mathematics you can expect on this exam and provide some worked examples.

The following questions from past exams are relevant:

- 2018_autumn_COMS30127: A 3 7 9; B 1 2
- 2018_sample_COMS30127: A 1 7 13; B 3abde
- 2018_summer_COMS30127: A 6 7 8 12; B 2 3
- 2019_autumn_COMS30127: A 4 5 9 10 15; B 3cdf
- 2019_summer_COMS30127: A 4 6 7 8 15; B 1 3

All the best,

Course Instructors.