Review Page, MAA 3200, Fall 2018

For the final exam, I'd suggest a thorough review of the assigned HW, especially over the last 1/3 of the course. Roughly that means Ch.3.7 through Ch.10.6, plus the online pdf about R, though we skipped chapters 5-8, and did not cover Ch. 9 or 10 thoroughly. If time permits, do more problems from those sections for practice, and also review the HW from the first 2/3's of the course. Study the textbook proofs listed below. If I gave a different proof in class than the text, you can learn either. The statements below may be rough - learn the precise versions.

Every Cauchy sequence converges in R. See page 78.
If f is continuous, the pre-image of any open set is open. p. 284.
The Intermediate-Value Thm. p. 129.

The following proofs are also possible on the final, but are less likely. They might be optional, or I might just ask for some small part of the proof.

R is complete. But instead of the full proof, I might ask about one of the HW - lemmas. See the link on the HW page.
Heine-Borel; a closed and bounded interval $[a, b]$ is compact. See page 112.
The EVT or a related theorem: a continuous function on $[a, b]$ must a) be bounded, b) be uniformly continuous and c) must have extreme values. We did b) and c) fairly carefully. Part a) is similar to b). Part c) is pretty easy. Pgs 116, 125, 127.

Probably you should allot more study time to the topics we spent longer on (limits and continuity, then perhaps topology, metrics and R). For the 'lesser topics', at least learn the definitions and a few examples. For example, you should know the definitions of open set, metric, R, liminf, dense, compact, uniformly continuous, etc, and be able to use them in basic proofs.

Topics from the last 1-2 lectures: I will probably expect a bit less mastery of these topics, but to outline the minimum skills:

Know the definitions of R and $x + y$ and $x < y$, and the statements about completeness and 'COF' and isomorphism (at least roughly).

I did not list the proof that Q is dense in R above, but it is pretty simple, and perhaps a reasonable question for the final.

Know the two metrics on $C[a, b]$ (see Ch.10.3), enough for TF or perhaps a simple calculation question. A limit proof in a metric space is possible. The one on page 309 might be a bit too hard but a simpler example, like the one in class, is possible.