Short list of topics for the midterm exam

Some of the topics listed below will be included (in a rephrased form) into the exam. It will be required to formulate the relevant definitions and theorems, and provide detailed proofs.

(1) Tests for a collection of subsets in a set for being a base of a topology in the set.
(2) Test for everywhere dense set.
(3) Relation between continuity and local continuity.
(4) Reformulations of the definition of a connected space.
(5) Properties of connected sets.
(6) Properties of connected components.
(7) Connectedness of the real line.
(8) Intermediate value theorem and its generalizations.
(9) Relation between connectedness and path-connectedness.
(10) Proofs of separation axioms for metric spaces.
(11) The Hausdorff axiom and its consequences.
(12) Second countability of a metric separable space.
(13) Sequential approach to topology and continuity.
(14) Relations between the properties of being closed and compact.
(15) Compactness and continuous maps.
(16) Compactness in Euclidean space.
(17) Homeomorphism between a fiber of product and the factor.
(18) Relations between topological properties of topological spaces and their product.
(19) Relations between topological properties of a topological space and its quotient space.
(20) Continuity of quotient maps.