Modern algebra II, spring 2015.

NAME:

Quiz 2

Mark the boxes that are followed by correct statements.

□ Polynomial $x^2 - x + 1$ is irreducible over $\mathbb{F}_3$.

□ Any polynomial $f(x)$ with coefficients in a finite field $\mathbb{F}_q$ is separable over that field.

□ Polynomial $(x^p - t)(x^p - 1)$ is separable over the field $\mathbb{F}_p(t)$, where $t$ is a formal variable.

□ The automorphism group of the field $\mathbb{F}_{27}$ is nontrivial.

□ Extension $\mathbb{F}_{16}/\mathbb{F}_2$ is Galois.

□ Any Galois extension is normal.

□ Any degree two field extension $E/F$ is Galois.

□ Splitting field of the polynomial $(x^3 - 5)(x^5 - 7)(x^7 - 3)$ is a simple extension of $\mathbb{Q}$.

□ An extension $E/F$ of degree 11 is Galois iff $\text{Gal}(E/F) \cong C_{11}$, where $C_{11}$ is a cyclic group of order 11.

□ If $\text{Gal}(E/F)$ is abelian then, for any intermediate field $K$, $F \subset K \subset E$, the group $\text{Gal}(E/K)$ is abelian.

□ A Galois extension $E/F$ has only finitely many intermediate subfields.