Teme i pojmovi za usmeni dio ispita iz Uvoda u algebarsku teoriju brojeva prema J.S.Milne: Algebraic Number Theory.

1. Integral elements: Theorem 2.2, Definition 2.3.
2. Review of norms and traces: page 25
3. Discriminant: page 26, Proposition 2.25.
4. Finding the ring of integers: Proposition 2.33.
5. Discrete valuation rings: page 37.
6. Dedekind's domains: page 38, Theorem 3.6.
7. The ideal class group: Theorem 3.21.
8. Factorization in extensions: Theorems 3.36, 3.37.
9. Finding factorizations: Theorem 3.43.
10. Examples of factorizations: page 54.
11. The finiteness of the class number: Theorems 4.3., 4.4., 4.18.
12. The unit theorem: Theorem 5.1., Lemma 5.2., Example 5.3.
13. Finding fundamental units in real quadratic fields: pages 77-78.
14. Valuations: pages 91-95.
15. Newton's and Hensel's lemmas: pages 101-104
16. Extensions of nonarchimedean valuations: Theorem 7.29.
17. Global fields: page 116.

Prema J.S.Milne: Fields and Galois theory.

1. Extension fields: pages 11-12
2. Algebraic and transcendental elements: pages 15-17
3. Splitting fields: pages 25-27
4. The fundamental theorem of Galois theory: Proposition 3.2., Definitions 3.6., 3.7. and 3.9., Theorem 3.16.

Zadaci koji se trebaju izraditi u MATEMATICI ili MAPLE-u.

1. Faktorizirajte $f(X) = 6X^2 + 18X - 24$ nad:
a) poljem racionalnih brojeva
b) $F_7[X]$
c) $F_{11}[X]$.
2. Faktorizirajte $f(X) = X^4 + 4$ nad:
a) poljem racionalnih brojeva
b) poljem generiranim korijenom polinoma $X^2 + 2X + 2$ nad $\mathbf{Q}$.
3. Odredite diskriminantu polinoma:
a) $f(X) = X^3 - 3X + 1$
b) $f(X) = X^3 + 3X + 1$
c) $f(X) = X^4 + 4X^2 + 2$
d) $f(X) = X^3 + aX^2 + bX + c$.
4. Odredite Galoisovu grupu polinoma iz zad. 3.
5. Odredite rastav ideala (2), (3) i (5) u $\mathbf{Q}[\alpha]$ ako je α korijen polinoma $f(X) = X^3 + 10X + 1$.
6. Odredite prvih 15 ciklotomskih polinoma.
7. Odredite fundamentalnu jedinicu realnog kvadratnog polja kojemu je diskriminanta redom: 5,8,12,13,17.