(1) Let A be a ring. Show that if A_p is reduced for every prime p then A is reduced.
(2) Give an example of an integral $B \supset A$ and a prime P_B over P_A such that B_{P_B} is not integram over A_{P_A}.
(3) Let M be a torsion module over a Dedekind domain A. Show that $M = \oplus_{i=1}^{k} A/p_i^{r_i}$ for some primes p_i and integers r_i.
(4) Is the number $(3 + 2\sqrt{6})/(1 - \sqrt{6})$ an algebraic integer?
(5) Show that if A is integrally closed then $A[X]$ is integrally closed.
(6) For a square free $D \in \mathbb{Z}$ find the ring of integers $\mathcal{O}_{\mathbb{Q}(\sqrt{D})}$.
(7) Show that $\mathcal{O}_{\mathbb{Q}(\sqrt[3]{2})} = \mathbb{Z}[\sqrt[3]{2}]$. How about $\mathcal{O}_{\mathbb{Q}(\sqrt[3]{2 \cdot 5^2})}$? (Take some traces.)
(8) If A a Dedekind domain, I a nonzero ideal, and $c \in Cl(A)$. Then there is an ideal $J \in c$ which is prime to I.
(9) Suppose A Dedekind with field K, and $L, L'/K$ separable extensions inside $\bar{K}$, and $P \subset A$ totally splits in L and in L'. Then P is totally splits in the compositum LL'.
(10) Suppose A Dedekind with field K, and L/K a separable extension. Then $P \subset A$ totally splits in L if and only if it is totally split in its Galois closure.