- (i) This is false in general, since it could be that g(n) = 1 for all n, f(n) = 2 for all n, and then $\log_2 g(n) = 0$, whence we cannot write $\log_2 f(n) \le c \log_2 g(n)$.

 On the other hand, if we simply require $g(n) \ge 2$ for all n beyond some n_1 , then the statement holds. Since $f(n) \le cg(n)$ for all $n \ge n_0$, we have $\log_2 f(n) \le \log_2 g(n) + \log_2 c \le (\log_2 c)(\log_2 g(n))$ once $n \ge \max(n_0, n_1)$.
- (ii) This is false: take f(n) = 2n and g(n) = n. Then $2^{f(n)} = 4^n$, while $2^{g(n)} = 2^n$.
- (iii) This is true. Since $f(n) \le cg(n)$ for all $n \ge n_0$, we have $(f(n))^2 \le c^2(g(n))^2$ for all $n \ge n_0$.

 $^{^{1}}$ ex66.350.972