Brian's Puzzle of the Week: 7

In its infinite wisdom, the Council of the University declared that each question on an LTU exam paper must be assigned either 6, 9 or 20 marks.

All LTU exams are stored in the library, and the head librarian observed that there are certain numbers that can't occur as the total number of marks on an exam.

For example, an exam can have a total of

6 + (3 x 9) + (2 x 20) = 73 marks,

but a total of 10 marks is not possible.

What is the largest number that cannot occur as the total number of marks on an LTU exam?

[This puzzle is related to the following general question: If p and q are natural numbers whose greatest common divisor (= highest common factor) is 1, then is there a largest number m that cannot be written in the form $ap + bq$ with $a, b \in \mathbb{N}$?]