

UNIT 14 QUESTIONS 16-20

SIM FRAC

2018A

19. **Answer (C):** Elements of set A are of the form $2^i \cdot 3^j \cdot 5^k$ for nonnegative integers i , j , and k . Note that the product

$$\left(1 + \frac{1}{2} + \frac{1}{2^2} + \cdots\right) \left(1 + \frac{1}{3} + \frac{1}{3^2} + \cdots\right) \left(1 + \frac{1}{5} + \frac{1}{5^2} + \cdots\right)$$

will produce the desired sum. By the formula for infinite geometric series, this product evaluates to

$$\frac{1}{1 - \frac{1}{2}} \cdot \frac{1}{1 - \frac{1}{3}} \cdot \frac{1}{1 - \frac{1}{5}} = 2 \cdot \frac{3}{2} \cdot \frac{5}{4} = \frac{15}{4}.$$

The requested sum is $15 + 4 = 19$.