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5. (10 points)

(a) **Answer:**Since  $2^7 = 128 \equiv 13 \pmod{23}$ ,  $\log_2(13) = \boxed{7}$  in  $\mathbb{F}_{23}$ .(b) **Answer:**Since  $10^{11} \equiv 22 \pmod{47}$ ,  $\log_{10}(22) = \boxed{11}$  in  $\mathbb{F}_{47}$ .(c) **Answer:**Since second column of Table 2.1 on page 64 shows that  $627^{18} \equiv 608 \pmod{941}$ ,  $\log_{627}(608) = \boxed{18}$  in  $\mathbb{F}_{941}$ .