

$$L = \{a^p \mid p \text{ is prime}\}$$

$$P = 2, 3, 5, 7, 11$$

$$\therefore L = \{aa, aaa, aaaaa, \dots\} \text{ all prime}$$

$$\text{Let } w = aa$$

$$w = uv^i xy^i z$$

$$u \in \epsilon \quad z \in \epsilon \quad y \neq \epsilon \quad (v \neq y \text{ both can't be } \epsilon \text{ at a time})$$

$$\therefore w = \epsilon v^i x \epsilon \epsilon$$

$$= v^i x$$

$$w = (a)^i a$$

$$\therefore w = aa \text{ when } i=1$$

$$w = aaa \text{ when } i=2$$

$$w = aaaa \text{ when } i=3$$

not in L

$$L = \{a^i b^j \mid j = i^2\}$$

$$j = i^2$$

$$1 = 1$$

$$2 = 4$$

$$3 = 9$$

$$\Rightarrow L = \{ab, aabbbb, \dots\}$$

$$w = uv^i xy^i z$$

$$u = z = \epsilon$$

$$v \neq y \neq \epsilon$$

$$y = \epsilon$$

$$w = \epsilon v^i x \epsilon \epsilon$$

$$= v^i x$$

$$= (a^i) b$$

$$i = 1$$

$$w = ab$$

$$i = 2 \quad w = aab \text{ not in } L$$

$$L = \{a^i b^j c^k \mid i < j < k\}$$

$$L = \{abbbccc, aabbbccccc, \dots\}$$

$$w = uv^i xy^i z$$

$$u \neq \epsilon \quad z \neq \epsilon \quad w = v^i xy^i$$

$$w = (a)^i (b^j) (c^k)^i$$

$$i = 1 \quad w = abbbccc$$

$$i = 2 \quad w = aabbbccccc \text{ not in } L$$