

Or

2. (a) State and explain pumping lemma. Prove that the following language $L = \{a^n : n \text{ is a perfect square}\}$ is not regular. 8
- (b) Construct a finite automata equivalent to the regular expression $(0 + 1)^* (00 + 11) (0 + 1)^*$ 8

Unit - III

3. (a) Convert the grammar $S \rightarrow AB$
- A Bs/b
- B SA/a into GNF 8
- (b) Convert the given PDA to CFG
- $A = (\{q_0, q_1\}, \{a, b\}, \{z_0, z\}, s, q_0, z_0, \phi)$
- SPs given by
- $S(q_0, b, z_0) = (q_0, zz_0)$
- $S(q_0, n, z_0) = (q_0, n)$
- $S(q_0, b, z) = (q_0, zz)$
- $S(q_0, a, z) = (q_1, z)$
- $S(q_0, b, z) = (q_1, n)$
- $S(q_1, a, z_0) = (q_0, z_0)$ 8

Or

3. (a) What is PDA, Explain. Construct PDA equivalent to $L = \{a^n b^{n+m} a^m / n, m \geq 0\}$ 8