1) L_P is not regular.

let w = a^pb^pc^p+1d^p.
so then x=a^α, y=a^β, z=a^p-α-βb^pc^p+1d^p
let i = 3
then xyz = a^p+2βb^pc^p+1d^p
since β >= 1, p+2β > p+1, so xy^3z is not in L_P

L_P is not context-free (Assuming that winning by majority is not in the language)

let w = a^0b^3c^p+1d^p
then there are the following cases:

1) vx Contains only b's
2) vx contains b's and c's
3) vx contains only c's
4) vx contains c's and d's
5) vx contains only d's

In cases 1, 2, 4, and 5, setting i=0 would either remove the plurality or make it a majority.
In case 3, setting i=0 would remove the plurality.
so uv^0wx^0y is not in L_P

2) a) L_M is not regular

let w = a^0b^pc^p+1d^p
then either

x = c^α, y = c^β, z=c^p-α-β+1d^p

let i = 0
then xyz = a^0b^0c^p-β+1d^p
since β >= 1, p-β+1 <= p, so xy^0z is not in L_M

b) M = (Q, Σ, Γ, δ, q0, {q3})

Q = {q0, q1, q2, q3, q4}
Σ = {a,b,c,d}
Γ = Σ union {$}
δ =

δ(q0, a, ε) -> q0, a
δ(q0, b, ε) -> q1, b
δ(q1, b, ε) -> q1, b
δ(q1, c, b) -> q2, ε
δ(q2, c, b) -> q2, ε
δ(q2, c, a) -> q2, ε
δ(q2, c, $) -> q2, c
δ(q2, c, c) -> q2, cc
δ(q2, d, c) -> q3, ε
δ(q3, d, c) -> q3, ε
δ(q3, d, $) -> q4, ε
δ(q4, *, ε) -> q4, ε

3) a)

G:

S -> ABCD
A -> aAc
A -> B
B -> bBc
B -> C
C -> cC
C -> cD
D -> cDd
D -> ε

b)

G:

S -> AS1
S1 -> BS2
S2 -> CD
A -> A1A2
A -> C1C
A -> C1D | C1
A2 -> AC1
A1 -> a
B -> B1b2
B -> C1C
B -> C1D | C1
B2 -> BC1
B1 -> b
C -> C1C
C -> C1D | C1
C1 -> c
D -> C1D2
D2 -> DD1 | D1
D1 -> d

4) L_W is not regular

let w = a^pb^p+1c^(p+1)*3d^p
then x = a^α, y=a^β, z=a^p-α-βb^p+1c^(p+1)*3d^p
let i = 3
then xyz = a^p+2βb^p+1c^(p+1)*3d^p
since β >= 1, p+2β > p+1, so xy^3z is not in L_M