01 **input**
02 $c_1, c_2, r_1, r_2, w, v_{min}, v_{max}$
03 **output**
04 *GB*
05 The fitness value of *GB*
06 **begin**
07 Initialize Population
08 **while** (max iteration or convergence criteria is not met) do
09 **for** $i = 1$ to numbers of particles
10 Evaluate fitness value of the particle by C4.5
11 **if** the fitness value of $X_i$ is greated than that of $PB_i$
12 **then** $PB_i = X_i$
13 **end if**
14 **if** the fitness value of $X_i$ is greated than that of *GB*
15 **then** $GB = X_i$
16 **end if**
17 **for** $d = 1$ to no of genes
18 $v_{id}^{new} = w \times v_{id}^{old} + c_1 r_1 (pb_{id}^{old} - x_{id}^{old}) + c_2 r_2 (pb_d^{old} - x_{id}^{old})$
19 **if** $v_{id}^{old} > v_{\max}$ **then** $v_{id}^{new} = v_{\max}$
20 **if** $v_{id}^{old} < v_{\max}$ **then** $v_{id}^{new} = v_{\min}$
21 **if** $sigmoid(v_{id}^{new}) > U(0,1)$
22 **then**
23 $x_{id}^{new} = 1$
24 **else**
25 $x_{id}^{new} = 0$
26 **end if**
27 **next** *d*
28 **next** *i*
29 **end while**
30 **end**