REPORT PODEM

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Algorithm:

```
PODEM()
begin
    if (error at PO) then return SUCCESS
    if (test not possible) then return FAILURE
    (k,v_k) = Objective()
    (j,v_j) = Backtrace(k,v_k)  /* j is a PI */
    Imply (j,v_j)
    if PODEM() = SUCCESS then return SUCCESS
    /* reverse decision */
    Imply (j,v̄_j)
    if PODEM() = SUCCESS then return SUCCESS
    Imply (j,x)
    return FAILURE
end
```

```
Backtrace (k,v_k)
/* map objective into PI assignment */
begin
    v=v_k
    while k is a gate output
        begin
            i = inversion of k
            select an input (j) of k with value x
            v=v⊕i
            k=j
        end
    /* k is a PI */
    return (k,v)
end
```

```
Objective()
begin
    /* the target fault is l s-a-v */
    if (the value of l is x) then return (l,v̄)
    select a gate (G) from the D-frontier
    select an input (j) of G with value x
    c = controlling value of G
    return (j,c̄)
end
```

```
If_success ()
Begin
        If (any outputs equal D or D')
            return true
        else
            return false
end
```

```
Imply (j,vj)
/*  the first task is to run the circuit with input vector PIs after change PIs[j] t0 vj , here the only difference with project1 is that the logic operation involves the 5 values : {0,1,x,D,D'}  */
Begin
        PIs[j] = vj
        Run the circuit with PIs as input vector

/* the second task is to add gates to the D-frontier */
        for each gate:
            if (any inputs equal D or D')
                if (the output is x)
                    add this gate to D-frontier
        end for

end
```

```
/* if not successful, then if_fail is called, the fault is L s-a-v */

If_fail ()
begin
        if ( value(L) == v )
            return true
        if ( D-frontier is empty)
            return true
        if (outputs are all
           known as 0/1)
            return true
        return false
end
```

Result:
(X means 0 or 1)

Fault	**S27**
16/0	X0X10X0
10/1	X00XXX0
12/0	1XXX1XX
18/1	11X101X

Fault	**S298f_2**
70/1	01X1XXXXXXXXX0XX
73/0	111XXXXXXXXXX0XX
26/1	XX1X1XXX0XXXXXXX
92/0	X10101XXXXXX0X0XX

Fault	**S344f_2**
166/0	01X00XXXXX011XX0XXXXXXX
71/1	10XXXXXXXXXXXXXXXXXXXX
16/0	10XXXXXXXXXXXXDXXXXXXX
91/1	111XXXXXXXXXXXXXXXXXXX

Fault	**S349f_2**
25/1	XXXXXXXXXXXXXX1XXXXXXX
51/0	00XXXXXXXXXXXX0XXXXXXX
105/1	01X1000XXX01XX10XXXXXXX
7/0	XXXXXX1XXXXXXXXXXXXXXX