Written Assignment One

1

a),b),c)
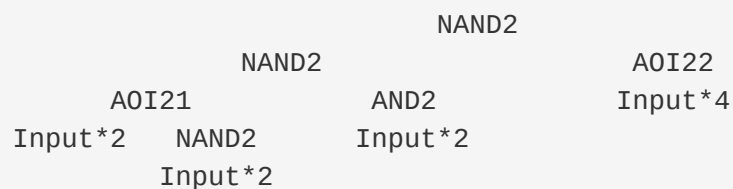
2
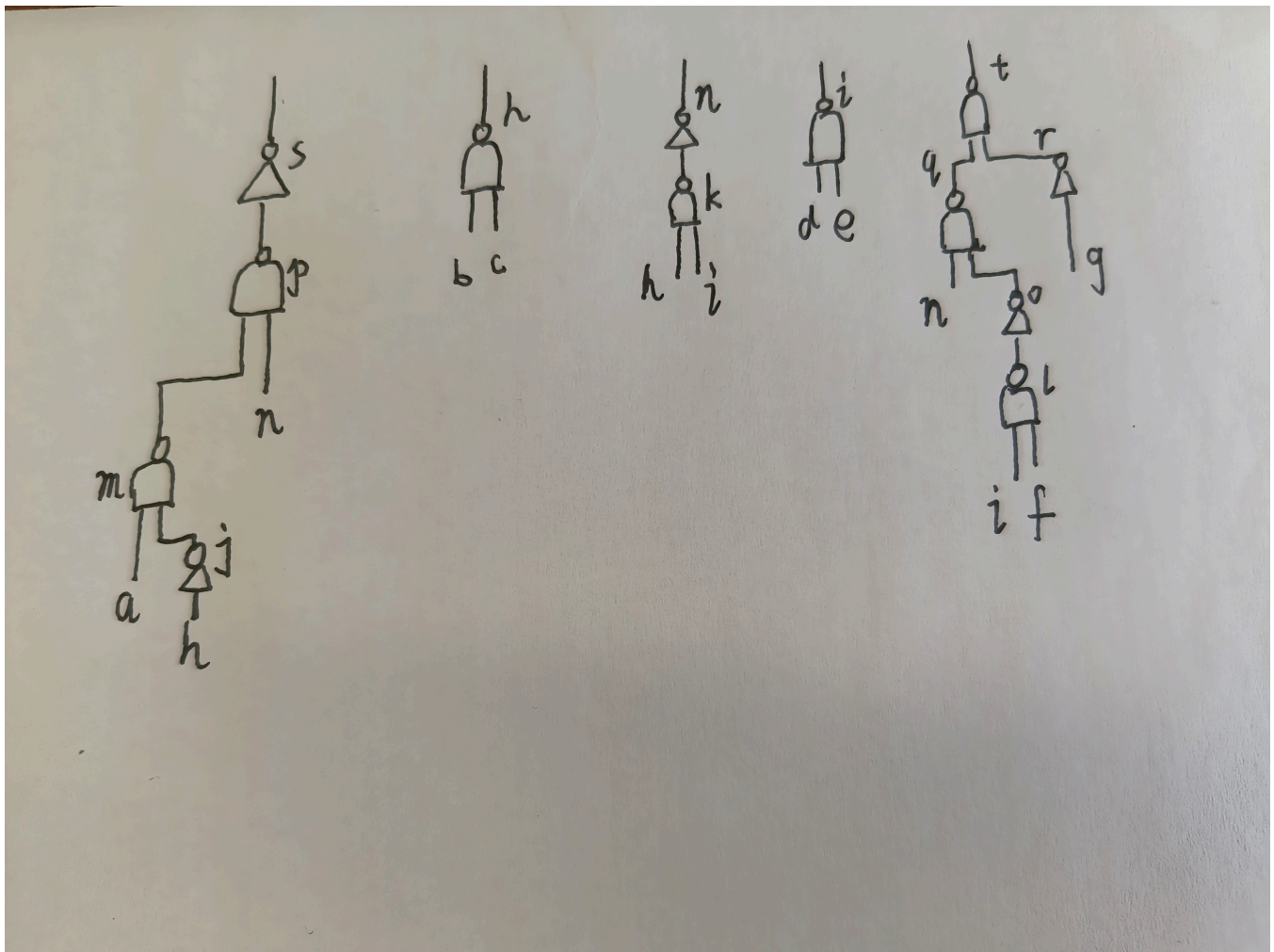
3

Node 13 : {NAND2}
Node 6 : {NAND2, OR2}

Node 12 : {NOT,AND2,AOI22}

Node 5 : {NOT,AND2,AOI21}

Node 8 : {NOT,AND2}

Node 11 : {NAND2}

Node 4 : {NAND2}

Node 7 : {NAND2}

Node 9 : {NAND2}

Node 10 : {NAND2}

Node 2 : {NOT,AND2}

Node 3 : {NAND2}

Node 1 : {NAND2}

$Min(N1) = 3$

$Min(N3) = 3$

$Min(N2) = Min(2+Min(N1),4) = 4$

$Min(N10) = 3$

$Min(N9) = 3$

$Min(N7) = 3$

$Min(N4) = 3+Min(N2)+Min(N3) = 10$

$Min(N11) = 3+Min(N9)+Min(N10) = 9$

$Min(N8) = Min(2+Min(N7),4) = 4$

$Min(N5) = Min(2+Min(N4),4+Min(N2)+Min(N3),7+Min(N1)) = 10$

$Min(N12) = Min(2+Min(N11),4+Min(N9)+min(N10),7) = 7$

$Min(N6) = Min(3+Min(N5)+Min(N8),5+Min(N4)+Min(N7)) = 17$

$Min(N13) = 3+Min(N6)+Min(N12) = 27$

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                              NAND2
                 NAND2                      AOI22
          AOI21              AND2        Input*4
     Input*2    NAND2     Input*2
              Input*2
```

The minimum cost value is 27.

4

a),d)

5

a

1+3=4,
1+1=2,
2+3=5,
3+2=5.

So 4+2+5+5 = 16.

b

Net B and Net D.

(2+3)-2+(1+2)-5 = 1

c

$e^{\frac{-1}{10}} \approx 0.905$

6

c),d),e)