Examen – 27 de Enero de 2015

Problema 1	10 (2,2,3,3) ptos	

a) 32525_8

b) 24_{10} no es representable en complemento a 2 con 5 bits.

c) 25

d) 0 01111111 00000000000000000000000

Problema 2	20 (10,10) ptos				

a)
```
function res = p2a(vect)
    n = length(vect);
    res = zeros(1, n);
    aux = vect;
    for i=1:n
        [min_aux pos] = min(aux);
        res(i) = min_aux;
        aux = aux([1:pos-1, pos+1:length(aux)]);
    end

function [min, pos] = min(vect)
    min = +inf;
    pos = -1;
    n = length(vect);
    for i=1:  n
        if vect(i) < min
            min = vect(i);
            pos = i;
        end
    end
```

b)
```
function res = p2b(vect, a)
    n = length(vect);
    if n == 0
        res = [a];
    else
        prim = vect(1);
        if a <= prim
            res = [a, vect];
        else
            resto = vect(2:n);
            res_resto = p2b(resto, a);
            res = [prim, res_resto];
        end
    end
```

Problema 3	23 (9,9,5) ptos				

a)

```matlab
function res = p3a(vect)
    res = [];
    n = length(vect);
    if n > 0
        ult = vect(1);
        res = [ult];
        for i=2:n
            if vect(i) ~= ult
                ult = vect(i);
                res = [res, ult];
            end
        end
    end
```

b)

```matlab
function res = p3b(vect)
    n = length(vect);
    if n <= 1
        res = vect;
    else
        prim = vect(1);
        seg = vect(2);
        resto = vect(3:n);
        if prim == seg
            res = p3b([seg, resto]);
        else
            res = [prim, p3b([seg, resto])];
        end
    end
```

c)

```matlab
function [res, largo] = p3c(vect)
    n = length(vect);
    if n <= 1
        res = vect;
        largo = n;
    else
        prim = vect(1);
        seg = vect(2);
        resto = vect(3:n);
        if prim == seg
            [res, largo] = p3c([seg, resto]);
        else
            [res_resto, largo_resto] = p3c([seg, resto]);
            res = [prim, res_resto];
            largo = largo_resto + 1;
        end
    end
```

Problema 4	29 (13,12 ,4) ptos				

a)

```
function res = UniConOrdI(a, b)
    n = length(a);
    m = length(b);
    i = 1;
    j = 1;
    res = [];
    while i <= n & j <= m
        if a(i) < b(j)
            res = [res, a(i)];
            i = i + 1;
        elseif a(i) > b(j)
            res = [res, b(j)];
            j = j + 1;
        else
            res = [res, a(i)];
            i = i + 1;
            j = j + 1;
        end
    end
    while i <= n
        res = [res, a(i)];
        i = i + 1;
    end
    while j <= m
        res = [res, b(j)];
        j = j + 1;
    end
```

b)

```
function res = UniConOrdR(a, b)
    n = length(a);
    m = length(b);

    if n == 0 & m == 0
        res = [];
    elseif n == 0
        res = b;
    elseif m == 0
        res = a;
    else
        prim_a = a(1);
        prim_b = b(1);
        resto_a = a(2:n);
        resto_b = b(2:m);
        if prim_a < prim_b
            res = [prim_a, UniConOrdR(resto_a, b)];
        elseif prim_a > prim_b
            res = [prim_b, UniConOrdR(a, resto_b)];
        else
            res = [prim_a, UniConOrdR(resto_a, resto_b)];
        end
    end
```

c)

Para implementar la intersección, solo se debiera agregar elementos a "res" en los casos en que ambos valores son iguales.

Problema 5	18 (9,9) ptos				

a)
```
function [rn, ri, rj] = p5a(an, ai, aj, x, y)
     n = length(an);
     rn = [];
     ri = [];
     rj = [];
     for ind=1:n
          if an(ind) ~= x
               ri = [ri, ai(ind)];
               rj = [rj, aj(ind)];
               if an(ind) == y
                    rn = [rn, y * 3];
               else
                    rn = [rn, an(ind)];
               end
          end
     end
```
b)

```
function [rn, ri, rj] = p5b(an, ai, aj, x, y)
     n = length(an);
     if n == 0
          rn = [];
          ri = [];
          rj = [];
     else
          an_prim = an(1);
          ai_prim = ai(1);
          aj_prim = aj(1);
          [rn, ri, rj] = p5b(an(2:n), ai(2:n), aj(2:n), x, y);

          if an_prim ~= x
               ri = [ai_prim, ri];
               rj = [aj_prim, rj];
               if an_prim == y
                    rn = [y * 3, rn];
               else
                    rn = [an_prim, rn];
               end
          end
     end
```