EECS210 **Written HW#5** **Due: 10-31-17**

Instruction: You must show all your calculations clearly for credit.

1. (8) Compute $\sum_{i=28}^{n} (3i^2 - 4i + \frac{5}{7^i})$. Do not simplify your solution.

2. (8) Compute $\sum_{i=1}^{n} i(i+1)(i+2)$. Simplify your solution.

3. (12) Compute $\sum_{i=28}^{n} \sum_{j=i}^{n} (3i + 4j - 5ij)$. Do not simplify your solution.

4. (12) Compute $\sum_{i=1}^{n} \frac{i}{3^i}$. Simplify your solution.

5. (12) Compute $\sum_{i=1}^{n} \frac{i}{2^{n-i+1}}$. Simplify your solution.

6. (12) Compute $\frac{1}{2*5} + \frac{1}{3*6} + \frac{1}{4*7} + ... + \frac{1}{(n-2)(n+1)} + \frac{1}{(n-1)(n+2)}$ using the technique of telescoping summation. Do not simplify your solution.

7. (12) Recall that $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$ and $\sum_{i=1}^{n} i^2 = \frac{n(n+1(2n+1)}{6}$. Compute $\sum_{i=1}^{n} i^3$ using the technique of telescoping summations.

8. (12) By concentrating on the dominating step(s) and also assuming that all basic operations are having the same constant cost C, compute $T_w(n)$ in closed-form for the following program segment. Do not simplify your solution.

```
x = 210;
y = 560;
for i = 1 to n do
    for j = 1 to 2*i do
        x = 3*x + 1;
    endfor;
    for k = i to n*n do
        y = x*y/2;
    endfor;
endfor;
```

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