SU2 Exercise 1 MEMO

Write the Tau-notation for the following code:

1. if(weight==60) 2τfetch + τ<
2. if(a<b++) 3Tfetch + T+ + Tstore + T<
3. return --length; 2Tfetch + T- + Treturn + Tstore
4. a=b[--c]; 5Tfetch + T- + T[.] + 2Tstore
5. if(x>=y[z]) 4Tfetch + T[.] + T<
6. if(age-10==40) 3Tfetch + T- + T<
7. if(x*=z<60) 3Tfetch + T* + Tstore + T<
8. if(x[i]>z[c]) 6Tfetch + 2T[.] + T<
9. x=getY(a[1]); 3τfetch + τ[.] + τcall + TgetX() + 2τstore
10. sum=x[2]+z[0]; 6Tfetch + T+ + Tstore + 2T[.]
11. ans = A + getB(C); 2τfetch + τcall + TgetB() + 2τstore + τ+
12. Now analyse questions 1 to 6 again using the simplified method.

    a. if(weight==60) 2Tfetch + T< 3
    b. if(a<b++) 3Tfetch + T+ + Tstore + T< 6
    c. return --length; 2Tfetch + T- + Treturn + Tstore 5
    d. a=b[--c]; 5Tfetch + T- + T[.] + 2Tstore 9
    e. if(x>=y[z]) 4Tfetch + T[.] + T< 6
    f. if(age-10==40) 3Tfetch + T- + T< 5

Use the simplified model to analyse the following program segments. Remember to write your answers in the simplest form.

13. for(int i = 0;i <= n; ++i)

    a. 2 b. 3(n+2)|3n + 6 c. 4(n+1)|4n+4 Total: 7n+12

14. for(int i=0;i<=n+1;++i)

    a. {2} b. 5(n+3) c. 4(n+2) Total:9n+25

15. Study the code below. Write down the correct simplified analysis of lines 6a,6b,6c and 8a, 8b and 8c.

```
1   public class Question
2   {
3     public static int numbers (int n)
4     {
5     int ans = 1;
6     for (int i=1;  i<=n;  i++ )
7       {
8          for ( int j=0;  j<=i+1; ++j)
9            ans +=i;
10        }
11      return ans;
12    }
13  }
```

6a.	2	8a.	2n
6b.	3(n+1)	8b.	$5\sum_{i=1}^{n}(i+3)$
6c.	4(n)	8c.	$4\sum_{i=1}^{n}(i+2)$

16. Again, study the code in question 15. Write down the asymptotic analysis of lines 6a, 6b, 6c and 8a, 8b and 8c.

6a.	O(1)	8a.	O(n)
6b.	O(n)	8b.	$O(n^2)$
6c.	O(n)	8c.	$O(n^2)$