CSC 3320 : System-Level Programming
Fall 2024: Exam 2 Key

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1. (2 points) Ans: The following answers should produce the correct results

   ```
   a = (a % 2) ? (a + 1) : (a - 1);
   (a % 2) ? ++a : --a;
   (a % 2) ? a++ : a--; /* It will produce correct output after the statement, NOT immediately */
   ```

   Please note the following option is not correct:

   ```
   (a % 2) ? a = a + 1 : a = a - 1; /*assignment is not allowed in expression */
   ```

2. (2 points) Ans: The format specifier specifies output format for a double-type number. 6 specifies the maximum width of the output including the decimal point and 2 specifies the number of digits after the decimal point (numbers can be truncated).

   What will be printed: 123.34 (Also accept 123.35 as the correct answer)

3. (2 points) Ans: c1= a, c2 = ' ' (space)

   Modification for correction:
   `scanf(" %c", &c2);` /* OR */ `scanf("%c %c", &c1, &c2);`

4. (3 points) Ans:

   ```
   x = 0
   *ptr = 0
   x = 5
   *ptr = 5
   x = 6
   *ptr = 6
   ```

5. (3 points) Ans: Infinite loop

6. (3 points) Ans: 3 4 5 4

7. (3 points) Ans: The given statement compares `x`, `y`, and `z` using conditional operator and finds the largest among the three (x, y, and z) and assigns it to `a`.

8. (3 points) Ans: 10. **Explanation:** This is because each time the function is called, the `count` is incremented by the argument `i`. As `count` is a `static` variable, all the previous updates are saved (not lost).

9. (3 points)

   ```
   #include <stdio.h>
   int count_positive(int a[], int n)
   {
       /* write your code */

       int i. sum=0;

       for(i = 0; i < n; i++)
           if(a[i] > 0)
               sum += 1;

       return sum;
   }
   ```

Ans: Code written above (in the function block)

10. (3 points) Ans: Multiple solutions exist:

```
1    if(n==0)
         return 1;
     else
         return x * power(x, n-1);

2  return n==0? 1: x*power(x, n-1);
```

11. i) (2 points) Ans: A
    ii) (1 point) Ans: C
    iii) (1 point) Ans: D
    iv) (2 points) Ans: A (0 2)
    v) (2 points) Ans: C
    vi) (3 points) Ans: D (16, 21)
    vii) (1½ points) Ans: A
    viii) (2 points) Ans: A (will never be printed)
    ix) (3 points) Ans: B
    x) (1½ points) Ans: A (x = 0)
    xi) (2 points) Ans: B
    xii) (2 points) Ans: B

12. i) (2 points (bonus)) Ans:

```
int factorial(int n)
{
   /* Write your single line of code */

    return n == 0 ? 1: n*factorial(n-1);


}
```

    ii) (3 points (bonus)) Ans:

```
#include<stdio.h>

int main()
{
    int n;
    printf("Enter an integer:");
    scanf("%d", &n);
    int i, sum=0;

    if(n <= 1)
      printf("This is not a perfect number.");

    else {

        sum = 1;
        for(i = 2; i <= n/2; i++) {
```

```
            if(n % i == 0)
                sum += i;
        }
        if(sum == n)
            printf("This is a perfect number.");
        else
            printf("This is not a perfect number.");
    }

    return 0;
}
```

Question:	1	2	3	4	5	6	7	8	9	10	11	12	Total
Points:	2	2	2	3	3	3	3	3	3	3	23	0	50
Bonus Points:	0	0	0	0	0	0	0	0	0	0	0	5	5
Score:													