C Programming Language: Beginning exam 2014-9-16

1.

(A) C 語言並非物件導向語言
(B) 應訂正為 == 運算子
(C) C 語言中，字串並無 + 運算子
(D) 正解

2.

(1) 第四行應訂正為 int x = 3;
(2) 4
6
6

3.

```
#include <stdio.h>

int main()
{
	int a, b;

	while(scanf("%d%d", &a, &b) != EOF)
		printf("%d\n", a + b);

	return 0;
}
```

4.

```
#include <stdio.h>
#include <limits.h>

int main()
{
	unsigned int a, b;

	while(scanf("%u%u", &a, &b) != EOF)
	{
		if (UINT_MAX - a < b)
			printf("Yes\n");
		else
			printf("No\n");
	}
```

```
}
```

5.

```
#include <stdio.h>

int gcd(int a, int b)
{
	if (a && b)
		return gcd(b, a % b);
	else
		return (a + b);
}

int main()
{
	int a_child, a_parent, b_child, b_parent;

	while(scanf("%d/%d + %d/%d", &a_child, &a_parent, &b_child, &b_parent) != EOF)
	{
		int c_child = a_child * b_parent + b_child * a_parent;
		int c_parent = a_parent * b_parent;
		int c_gcd = gcd(c_child, c_parent);

		printf("%d/%d + %d/%d = %d/%d\n",
			a_child, a_parent, b_child, b_parent, c_child / c_gcd, c_parent / c_gcd);
	}
	return 0;
}
```

6.

```
#include <stdio.h>
#include <ctype.h>

int main()
{
	int ch;

	while((ch = getchar()) != EOF)
	{
		if (isalpha(ch) || ch == '\n')
			putchar(ch);
		else if (ch == ':' || ch == '-')
```

```
                putchar(' ');
        }

        return 0;
    }
```

7.

```
    #include <stdio.h>
    #include <stdlib.h>

    int cmp(const void *a, const void *b)
    {
        return (*(unsigned int*)b - *(unsigned int*)a);
    }

    int main()
    {
        unsigned int cnt;

        while(scanf("%u", &cnt) != EOF)
        {
            unsigned int a, b, c, d;
            unsigned int *array = (unsigned int*)malloc(cnt * sizeof(unsigned int));

            for (int i = 0; i < cnt; ++i)
            {
                scanf("%u%u%u%u", &a, &b, &c, &d);
                array[i] = (a << 24) + (b << 16) + (c << 8) + d;
            }

            qsort(array, cnt, sizeof(unsigned int), cmp);

            for (int i = 0; i < cnt; ++i)
                printf("%u\n", array[i]);
        }

        return 0;
    }
```

8.

```
    #include <stdio.h>
    #include <string.h>
```

```
int main()
{
	char a[50 + 1];
	int b;

	while(scanf("%s%d", a, &b) != EOF)
	{
		int reminder = 0;

		for (int i = 0; i < strlen(a); ++i)
			reminder = ((a[i] - '0') + reminder * 10) % b;

		if (reminder == 0)
			printf("Yes\n");
		else
			printf("No\n");
	}

	return 0;
}
```

9.

```
#include <stdio.h>
#include <math.h>
#include <float.h>

#define EPS			1e-10
#define Calculate(x)	(p * exp(-x) + q * sin(x) + r * cos(x) + s * tan(x) + t * pow(x, 2.0) + u)

int main()
{
	int p, q, r, s, t, u;

	while(scanf("%d%d%d%d%d%d", &p, &q, &r, &s, &t, &u) != EOF)
	{
		double value_0 = Calculate(0.0), value_1 = Calculate(1.0);

		if (value_0 < -EPS || value_1 > EPS)
		{
			printf("No solution\n");
		}
```

```
            else
            {
                double begin = 0.0, end = 1.0;

                while(end - begin > EPS)
                {
                    double middle = (begin + end) / 2.0;

                    if (Calculate(middle) > 0)
                        begin = middle;
                    else
                        end = middle;
                }

                printf("%.4f\n", begin);
            }
        }

        return 0;
    }
```

10.

```
    #include <stdio.h>
    #include <string.h>

    int main()
    {
        FILE *fp;
        char key[1024 + 1];

        printf("Input Encode Key (English only):\n");
        gets(key);

        if (fp = fopen("input.txt", "r"))
        {
            int ch;

            while((ch = fgetc(fp)) != EOF)
            {
                for (int i = 0; i < strlen(key); ++i)
                    ch ^= key[i];
                putchar(ch);
            }
```

```
        fclose(fp);
    }
    else
    {
        printf("Can't open file!\n");
    }

    return 0;
}
```