Name:

Roll No: e.g. 170001 | **Dept.**: e.g. CHE | **Sect.**: e.g. A4

IIT Kanpur
ESC101 Fundam. of Comp.
Major Quiz 1A
Date: January 31, 2018

Instructions:

Total: **45 marks**

1. This question paper contains a total of 6 pages (6 sides of paper). Please verify.
2. Write your name, roll number, department, section on **every side of every sheet** of this booklet
3. Write final answers **neatly with a pen** in the given boxes.
4. Do not give derivations/elaborate steps unless the question specifically asks you to provide these.

Problem 1 (: 6 + 4 + 5 marks)**.** Give your answers in the space provided only.

1. ***Write T or F in the box for True and False respectively***

1.		The value of -45%6 is 3 in C.	F
2.		$8 > 6 > 4$ evaluates to 0.	T
3.		The expression $a < b < c$ is same as $(a < b)\&\&(b < c)$	F
4.		Value of $5/2 * 2$ is not equal to value of $5 * 2/2$	T
5.		To check equality of two floating point expressions we should use ==	F
6.		The loop for(i = 0; i < n; i++) and for(i = 0; i < n; ++i) are functionally same	T

2. ***Write output in the space below***

```
1 #include<stdio.h>
2 int main() {
3   printf("%4d\n", 1);
4   printf("%3d%2d\n", 1, 1);
5   printf("%2d%4d\n", 1, 1);
6   printf("%d\n", 1111111);
7   return 0;
8 }
```

```
1    1
2   1 1
3  1   1
4 1111111
```

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3. ***Write output in the space below***

```
1  #include<stdio.h>
2  int main() {
3    int a = 3, b = 4, c=1;
4    if(++a <= b++) {
5      c=++a*--b+c;
6      printf("%d %d %d\n", a, b, c);
7    }
8    else if(++b < a++){
9      c=--a*++b+c;
10     printf("%d %d %d\n", a, b, c);
11   }
12   else {
13     c=b++*a++*c;
14     printf("%d %d %d\n", a, b, c);
15   }
16   printf("%d \n", a+1);
17   printf("%d\n", a++);
18 }
```

```
1  5 4 21
2  6
3  5
```

Problem 2 (Conditionals bang! : 2 + 3 + 4 + 6 marks**).** Give your answers in the space provided only.

1. ***Write output in the space below if the program runs properly or write "RUNTIME ERROR" or "COMPILE ERROR"***

```
1  #include<stdio.h>
2  int main() {
3    int a = 8;
4    int b = 3;
5    if(a || b/0) printf("New life!\n");
6    return 0;
7  }
```

```
1  New life!
```

2. ***Write output of the following program***

```
1  #include<stdio.h>
2  int main() {
3    int a = 10;
4    if(a%5==0) printf("Monday\n");
5    if(a%15==0) printf("Wednesday\n");
6    else printf("Thursday\n");
7    return 0;
8  }
```

```
1  Monday
2  Thursday
```

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3. ***Write output of the following program when it is given "2 3 4" followed by "4 5 4" as input.***

```
1  #include<stdio.h>
2  int main() {
3    int a,b,c,i;
4    for (i=0;i<2;i++){
5      scanf("%d %d %d",&a,&b,&c);
6      if(a>b) b = a;
7      else a = b;
8      if(c==a) printf("New world\n");
9      else if(c>b) printf("Old world\n");
10     else printf("Out of this world\n");
11   }
12   return 0;
13 }
```

```
1  Old world
2  Out of this world
```

4. ***Write output in the space below***

```
1  #include<stdio.h>
2  int main() {
3    int a = 8;
4    int b = 3;
5    if(b = a/2) printf("New rules!\n");
6    else printf("Old is gold!\n");
7    switch (b){
8      case 3: printf("Rock on!!\n ");
9      case 4: printf("Interesting!\n");
10     case 8: printf("Great!\n");
11     default:printf("Same old stuff\n");
12   }
13   return 0;
14 }
```

```
1  New rules!
2  Interesting!
3  Great!
4  Same old stuff
```

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Problem 3 (Froot Loops! : 4 + 4 + 7 marks). Leonardo visited Uncle Nolan this summers to know his recipe for the renowned yummy froot loops he sells. Uncle Nolan whispered in his ears that there are three major ingredients he uses to make them. But extracting each of them requires some hard work. Given below are three programs for which you have to print the final output in the box provided to extract the ingredients. In case of crashing programs, write **CRASH** and similarly for infinite loops, write **INFINITE LOOP** in the box.

1. ***Ingredient 1 - Memento***

```
1  #include <stdio.h>
2
3  int main()  {
4    int a,b,c;
5    for(a=b=c=2000;a<2003||b>2010;a++)
6    {
7      printf("%1.2f\n", (float)a);
8      if((a-b+c)||((a+b+c)/(a-b))) b++;
9    }
10   return 0;
11 }
```

```
1  2000.00
2  2001.00
3  2002.00
```

2. ***Ingredient 2 - The Prestige***

```
1  #include <stdio.h>
2
3  int main()  {
4    int a=5,b=2006,c=2006;
5    while((a-=2) || -1)
6    {
7      if(b<2009)
8        if(c>2000)
9        {
10         a+=2;
11         b++;
12       }
13     else
14     {
15       a--;
16       b--;
17       c--;
18       break;
19     }
20   }
21   printf("%d\n",a*b/c);
22   return 0;
23 }
```

```
1  INFINITE LOOP
```

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3. ***Ingredient 3 - Interstellar***

```
1  #include <stdio.h>
2
3  int main()  {
4    int i,j;
5    for(j=0;j<3;j--)
6    {
7      do {
8        for(i=8;i>10;i++)
9        {
10         printf("%d,%d\n",i-j,2014);
11       }
12       ++j;
13       break;
14     } while(1);
15     printf("%d ", ++j+i++);
16     printf("%d %d\n",i,j);
17   }
18   return 0;
19 }
```

```
1  10 9 2
2  11 9 3
3  12 9 4
```

Fun Note: Those who couldn't get the references and arbit 2000+ values used in initialization, they know what they have to watch after this major quiz. Bug your tutor for the ingredients used in set B after the quiz and you will get some stuff for the weekend too! :D

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BLANK SPACE: Any answers written here will be left ungraded.
No exceptions.
You may use this space for rough work.