Department of Computer Science and Engineering
B.Sc. Engg. Part-I OddSemester, Examination-2017
Course: CSE1121(Computer Programming with C)
Time: 3 Hours Total Marks 52.5

(Answer any SIX (06) questions taking THREE (03) from each section)

Section A

1. (a) If *int i = 5, float f = 7.5, char c = 'a'*, what will be the output of (i) *i + c* and (ii) *i + f*? — output type 1

1a.c

```c
#include<stdio.h>

int main(){
    int i=5;
    float f=7.5;
    char c='a';
    printf(" %d ", c);
    printf(" %d ", i+c);
    printf(" %f ", i+c);
    printf(" %d ", i+f);
    printf(" %f ", i+f);


return 0;
}
```

```
"G:\1st semester\2017 question solve\1a.exe"
 97  102  0.000000  0  12.500000
Process returned 0 (0x0)   execution time : 0.016
Press any key to continue.
```

Output:

i) i+c =102

ii) i + f = 0

1b.c

```c
int main(){

    int i=10;
    float f=18.5;

    int result = (int)(i+f)%4;

    printf(" %d ", result);

 return 0;
}
```

```
"G:\1st semester\2017 question solve\1b.exe"
 0
Process returned 0 (0x0)   execution ti
Press any key to continue.
```

b) No output possible.
Because int and float cannot be added.

1c

```c
#include<stdio.h>

int main(){

    float num = 25.5;

    printf(" %d ", (num%2));

return 0;
}
```

25.5%2 not possible because 25.5 is a floating point number.

No output possible

1c.c

```c
#include<stdio.h>

int main(){

    float num = 25.5;

//  printf(" %d ", (num%2));
    printf("%d", ((int)num)%2);

return 0;
}
```

```
1
Process
Press an
```

(Int) 25%2 12*2=24 25-24 =1

Type def

(d) List the syntax error (if any) of each line of the following code (copy the code on your script, mark the error by placing an underline and then explain that error). 5.75

```
#include<stdio>
main()
{
intx,y;
scanf("%dd",&x,&y);
switch (x)
  {
   case(x<0): printf("x is positive"); break;
   case(x>0);printf("x is negative");
  }
x=f1(y);
printf("Final value of = %d\n", x);
}

void f1(int y)
{
y=y*y;
return y;
}
```

No output type

%dd unknown sinte

No condition allowed only int

1d.c

```
1   #include<stdio.h>
2
3   main()
4   {
5   int x,y;
6   scanf("%d%d",&x,&y);
7   switch(x)
8       {
9           case (x<0):printf("x is positive");break;
10          case (x>0):printf("x is negative");
11      }
12  x=f1(y);
13  printf("Final value of = %d\n",x);
14  }
15
16  void f1(int y)
17  {
18      y= y*y;
19      return y;
20  }
```

Here case have condition but we must use constant values for cases

2. (a) Explain 'the name of array can be considered as pointer'. Give an example how you can pass array to a function. 3.75

2 a) Answer: The name of array contains the address or location of the array in the memory. When we declare an array, we set the name of the array and set the index value up to n. Here, we set n number of memory space of the same data type in the corresponding location in the memory.

We use the array name as a pointer to store elements into the array. After that, we print the elements of the array using the same pointer.

An array name is a pointer (address), so we just pass an array name to a function which means to pass a pointer to the array.

```
int main(){
   int a[5]= {2,6,7,5,1};
   function(a);
 return 0;
}
void function(int array[]){
   for(int i=0;i<5;i++){
      printf(" %d", array[i]);
   }
}
```

```
1  #include<stdio.h>
2  int main(){
3
4      int a[5]= {2,6,7,5,1};
5
6      function(a);
7   return 0;
8  }
9
10 void function(int array[]){
11
12     for(int i=0;i<5;i++){
13         printf(" %d", array[i]);
14     }
15 }
```

```
"G:\1st semester\2017...
 2 6 7 5 1
Process returned 0
Press any key to c
```

(b) Write a C program that will take N number characters as input and a query character Q. You have to find out how many times Q occurs in that input character array. 5

Input: The input will have one integer N (100>N>0), then N number of characters and finally a query character Q.
For example:
20
a g b h b r a d f v c d b a f a g b a a
a

Output: The output will be the number of how many times Q occurs in that input array.
For example; the output for the above input will be: 6

```
#include<stdio.h>
#define N 100
int main(){

   int n,freq=0;
   char queue[N], search;
   printf("Enter one integer N (100>N>0): ");
   scanf("%d",&n);
   fflush(stdin);
   for(int i=0;i<n;i++){
      scanf("%c",&queue[i]);
   }
   fflush(stdin);
   printf("Enter a character to find its frequency: ");
   scanf("%c", &search);

   for(int i=0;i<n;i++){
     if(search == queue[i]){
      freq++;
     }
   }
   printf("Frequency: %d", freq);

   return 0;
}
```

```
Enter one integer N (100>N>0): 20
agbhbradfvcdbafagbaa
Enter a character to find its frequency: a
Frequency: 6
Process returned 0 (0x0)   execution time :
Press any key to continue.
```

3. (a) What do you mean by hierarchy of operation? Determine the hierarchy of operations and evaluate the following expression: 3.75

$i = 2*3/4+4/4+8-2+5/8.$

3 a) Answer: The priority in which the operations in an arithmetic statement are performed is called the hierarchy of operations. Operator precedence determines the grouping of terms in an expression and decides how an expression is evaluated. Certain operators have higher precedence than others.

Given,

i = 2 * 3 / 4 + 4 / 4 + 8 - 2 + 5 / 8

Stepwise evaluation of this expression is shown below:

i = 2 * 3 / 4 + 4 / 4 + 8 - 2 + 5 / 8

i = 6 / 4 + 4 / 4 + 8 - 2 + 5 / 8	operation: *
i = 1 + 4 / 4 + 8 - 2 + 5 / 8	operation: /
i = 1 + 1+ 8 - 2 + 5 / 8	operation: /
i = 1 + 1 + 8 - 2 + 0	operation: /
i = 2 + 8 - 2 + 0	operation: +
i = 10 - 2 + 0	operation: +
i = 8 + 0	operation: -
i = 8	operation: +

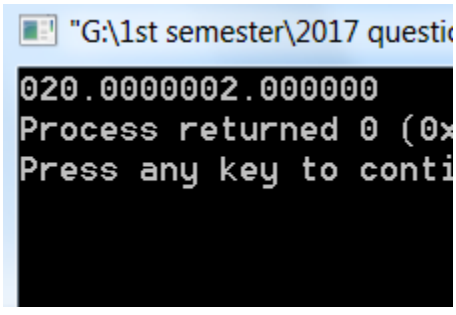
(b) Convert the equation into corresponding C statements: $R = \frac{2v + 6.22(c+d)}{g+v}$

3 b) Answer:

```
int R = ((2*v)+(6.22*(c+d)))/(g+v);
```

(c) What would be the output of the following program:

```
main()
{
int i=2, j=3,k,l;
   float a,b;
   k=i/j*j; l=j/i*i;
   a=i/j*j; b=j/i*i;
printf("%d%d%f%f", k,l,a,b);
}
```



Output:

020.0000002.000000

4. (a) What are the differences between compiler and interpreter? 2

COMPARISON	COMPILER	INTERPRETER
Input	It takes an entire program at a time.	It takes a single line of code or instruction at a time.
Output	It generates intermediate object code.	It does not produce any intermediate object code.
Working mechanism	The compilation is done before execution.	Compilation and execution take place simultaneously.
Speed	Comparatively faster	Slower
Memory	Memory requirement is more due to the creation of object code.	It requires less memory as it does not create intermediate object code.
Errors	Display all errors after compilation, all at the same time.	Displays error of each line one by one.
Error detection	Difficult	Easier comparatively
Pertaining Programming languages	C, C++, C#, Scala, typescript uses compiler.	PHP, Perl, Python, Ruby uses an interpreter.

(b) A student from the dept. of CSE developed the following code to get the expected output as given below. However, unfortunately his code has a single bug; therefore his code did not produce the expected output. 6.75

(i) What is the current output?

(ii) What is that single bug?

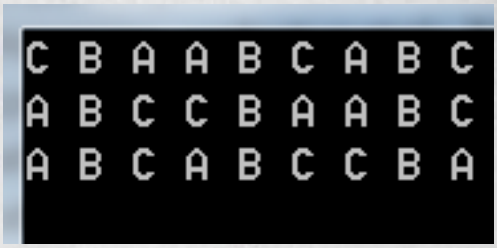
(iii) Fix that single bug to get the expected output (you can change/modify only one operator or replace only one variable by another one or change/replace value assigned to only one variable)

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

inti,j,k,x,y,z=3;

main()
{ for (i=1;i<=z;i++)
{  x=i;
for(j=1; j<=z ; j++)
{  y=j;
if(x!=y)
        {for (k=65; k<65+z; k++)
printf("%c ",k);
        }
else
        {for (k=64+z; k>=65; k--)
printf("%c ",k);
        }
}
printf ("\n");
}
getch();
}
```

Expected output:

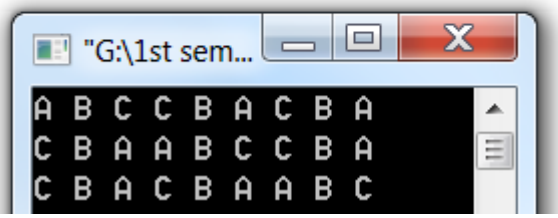
A B C C B A C B A
C B A A B C C B A
C B A C B A A B C

i) Solution: Current output



ii) Solution: Single bug is in the if condition of the 2nd loop.

```
1  #include<stdio.h>
2  #include<conio.h>
3
4  int i,j,k,x,y,z=3;
5
6  main(){
7      for(i=1;i<=z;i++){
8          x=i;
9          for(j=1;j<=z;j++){
10             y=j;
11             if(x==y){
12                 for(k=65;k<65+z;k++)
13                     printf("%c ",k);
14             }else{
15                 for(k=64+z;k>=65;k--)
16                     printf("%c ",k);
17             }
18         }
19         printf("\n");
20     }
21 getch();
22 }
23
```



iii) Solution:

Replace x!=y by x==y

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