



United International University (UIU)
Dept. of Computer Science & Engineering (CSE)

Final Exam Year: 2019

Trimester: Spring

Course: CSI 121 Structured Programming Language, Marks: 40, Time: 2 hours

There are FIVE questions. Answer all the questions. Figures in the margin indicate full marks.

1. a) Show manual tracing of the following code segment and find output 4.0
- ```
int num, sum, rem;
num=3459;
sum=0;
while(num>0){
 rem=num%10;
 sum=sum+rem;
 num=num/10;
 if (num==0) &&(sum%10 !=sum){
 printf(“%d %d %d\n”, rem, sum, num);
 num=sum;
 }
}
```

- b) Write a program that reads three binary numbers from keyboard, converts those binary numbers into decimal and shows each decimal number on monitor. Sample input and output are given below. 4.0

| Sample Input | Conversion Process           | Sample Output |
|--------------|------------------------------|---------------|
| 1101         | $1x2^3+1x2^2+0x2^1+1x2^0=13$ | 13            |
| 1001         | $1x2^3+0x2^2+0x2^1+1x2^0=9$  | 9             |
| 110          | $1x2^2+1x2^1+0x2^0=6$        | 6             |

2. a) Show manual tracing for the following program and find output 4.0
- ```
#include<stdio.h>
int a, b;
int func1(float x);
void func2(int x, float y);
int main(){
    a=10;
    b=20;
    printf(“%d %d\n”, a, b);
    a=func1(18.5);
    func2(23, 16.8);
    printf(“%d %d\n”, a, b);
    return 0;
}
int func1(float x) {
    b=b+a;
    printf(“%f\n”, x);
    return b;
}
void func2(int x, float y){
    printf(“%d %f\n”, x, y);
    return;
}
```

- b) Write a program using four user defined functions to perform the following operations 4.0
- i) main() reads two integer numbers and one operator of +, -, *, / from keyboard
 - ii) if operator are +, -, *, and /, then main() calls the user defined functions add(), sub(), mult() and div() respectively. Remember that add(), sub(), mult() and div() functions calculate the addition, subtraction, multiplication and division results of given two numbers and return results to the main()
 - iii) main() function prints the return values from the user defined functions on monitor

3. a) Find output for the following program 4.0

```
#include<stdio.h>
void func(int x);
int main(){
    func(3);
    return 0;
}

void func(int x){
    if (x==0) return;
    printf("%d\n", x);
    func(x-1);
    printf("%d\n", x);
}
```

OR

What will be the effect of the following program?

```
#include<stdio.h>
int main(){
    FILE *fp1;
    int i;
    char name[6]={'R', 'A', 'H', 'I', 'M', '\0'};
    fp1= fopen(dest.txt, "w");
    for(i=4; i>=0; i--){
        putc(name[i], fp1);
        putc('\n', fp1);
    }
    fclose(fp1);
    return 0;
}
```

- b) Write a program to read 10 integers from keyboard and to store all the numbers in a file. 4.0
4. Write a program having the structure student (name, id, marks, grade) to perform the following operations for 100 students 8.0
- a) Read name, id, marks of 100 students from keyboard
 - b) Find the student who got maximum marks
 - c) Find the student who got minimum marks
 - d) Calculate grade for each of the 100 students based on the fact that grades will be A, B, and C if marks are greater than 90, 80, and 70, respectively; otherwise grade will be F.
5. a) The following program is used to swap the contents of two pointer variables of integer type, but the program has some errors. Correct the program to get the specified operation. Assume, if the values of a and b integer type pointer variables are 10 and 20 respectively before swapping, then the values of a and b are 20 and 10 respectively after swapping. 4.0

```

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

int main(){
    int *a, *b, temp;
    a=(int*) malloc(sizeof(int));
    b=(int*) malloc(sizeof(int));
    scanf("%d%d", &a, &b);
    printf("%d %d\n", a, b);
    temp=a;
    a=b;
    b=temp;
    printf("%d %d\n", a, b);
    free(a);
    free(b);
    return 0;
}

```

b) Find output for the following program

4.0

```

#include<stdio.h>
void change(int *x);
int main(){
    int a=10;
    printf("%d\n", a);
    change(&a);
    printf("%d\n", a);
    return 0;
}
void change(int *x){
    *x=*x*11;
    ++*x;
    return;
}

```

OR

```

#include<stdio.h>
void func( int B[], int n);
int main(){
    int A[5]={10, 20, 30, 40, 50};
    int i;
    for(i=0; i<5; i++)
        printf("%d ", A[i]);
    func(A, 5);
    printf("\n");
    for(i=0; i<5; i++)
        printf("%d ", A[i]);
    return 0;
}
void func( int B[], int n){
    int i;
    for(i=0; i<n; i++)
        B[i]= B[i]*(i+1);
    return;
}

```