Discussion Instructor (Circle one):
A) Bassem S. (B) Nael Q. C) Samer Z. D) Wahbeh M. E) Yousef H.

I. (30%) *Select the best answer for each of the following questions (1-10):*

1) A local variable of a function is not visible in any other function.
(A) True (B) False

2) Every function prototype must include at least one formal parameter.
(A) True (B) False

3) In function do defined below, how many of the parameters are considered output parameters?

```
void do (double x, int *y, double *a)
{
    *y = (int)x;
    *a = x - *y;
}
```

A) 0 (B) 1 C) 2 D) 3

4) Given the following definition;
typedef enum {red, orange, yellow, green, blue} color_t ;
What is the value of this expression?
(color_t)((int)yellow - 1)
A) 1 (B) orange C) 2 D) invalid expression

5) If name is a string variable whose value is "saliman", the function call
strcpy(val, &name[3]);
assigns the string _____ to val.
A) saliman (B) iman C) man D) None of the above

6) The following function call stores in value the null-terminated string "ah".
strncpy(value, "ahmad", 2);
(A) True (B) False

7) What is the value of the expression that follows?
strcmp("49", "5");
A) negative B) 0 (C) positive (D) invalid expression

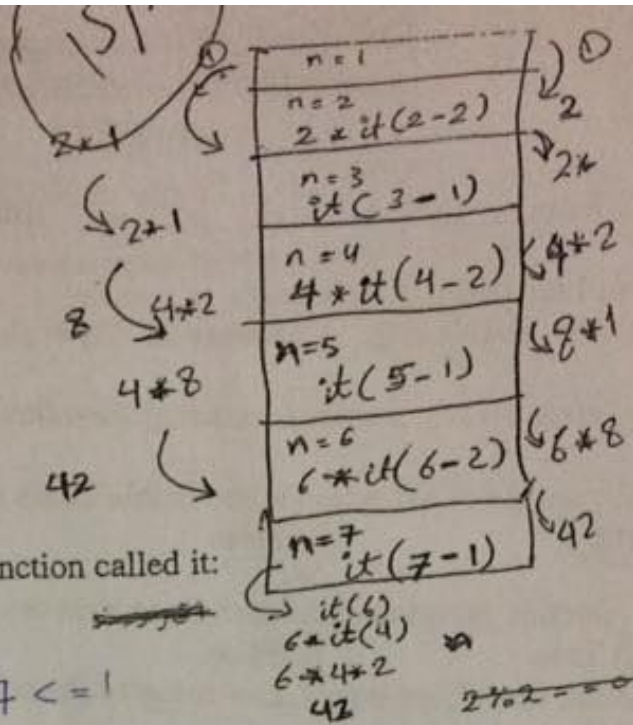
8) Given the following declaration, what is the value of **b[0][1]**?
int b[2][2] = {{1},{3,4}};
(A) 0 B) 1 C) 3 D) Not a valid declaration

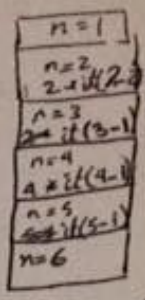
9) char str[] = "hell"
Printf("%d", strlen(str));
output is:
A) 0 B) 6 C) 5 (D) none of the above

10) int x[5] = {15,22,39,50,21};
int s = x[6%2] + x[2];
s = _____
A) 78 (B) 54 C) 61 D) none of the above

Answer *Sheet for Question I:*

1) B
2) A
3) D
4) B
5) B
6) A
7) C
8) A
9) D
10) D





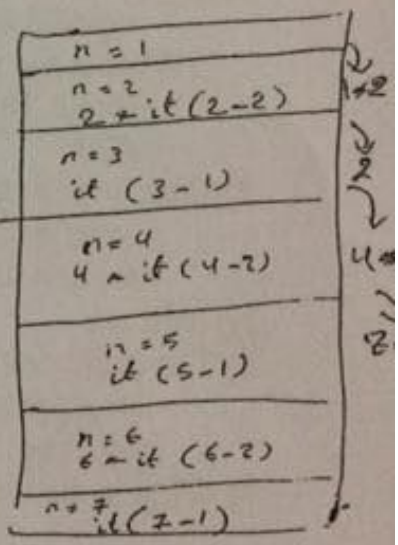
Question II (15%)

Given the following recursive function called it:

```
int it (int n)
{
    if (n <= 1)
      return 1;
    else if (n % 2 == 0)
      return n * it (n - 2);
    else
      return it (n - 1);
}
```

A)what is the output of the function *it* when called as follows:
it (7). Show your work.

Work



output

42

B) What does function it do if it is called with an integer greater than 1? Be clear and specific in your answer.

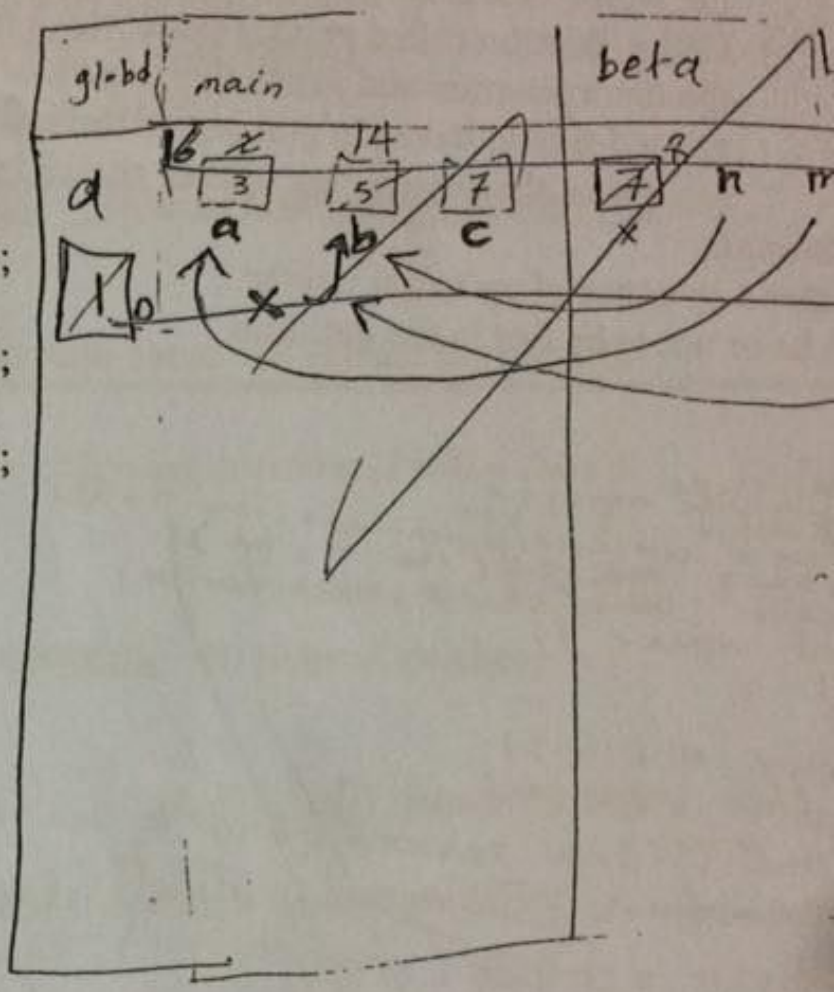
Answer:

Question III (25%)

Write the output for the following program in the specified box (show your work):

Work

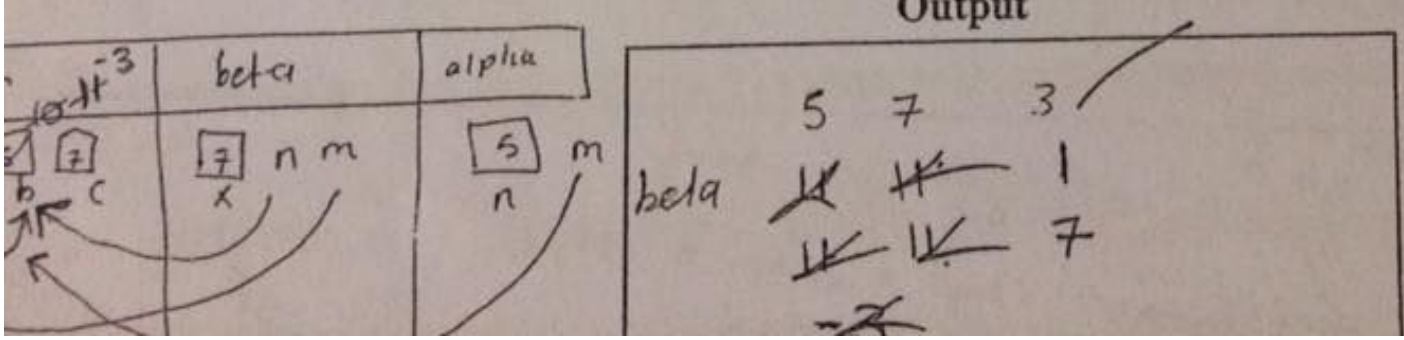
```
#include <stdio.h>
int alpha(int, int*);
void beta(int, int *, int *);
int a = 1;
void main()
{
        int a = 3, b = 5, c = 7;
        int *x=&b;
        printf("%d %d %d\n",b,c,a);
        beta(c,&b,&a);
        printf("%d %d %d\n",a,b,c);
        printf("%d\n", alpha(b, x));
        printf("%d %d %d\n",a,b,c);
}

int alpha (int n, int *m)
{
        a= n - *m;
        n += a;
        *m = a + 2;
        return (a + n + *m);
}

void beta( int x, int *n, int *m)
{
        *n = x * 2;
        *m += *n;
        x++;
        printf("%d %d %d\n",*n,*m,a);
}
```



-6+

alpha

Output



Question IV (30 %)

Write a ***complete*** C program that will ask the user to enter a sentence made of ***up to*** ten words of lower case letters separated by spaces. Your program should then:

a) Call a function called ***sort_words*** which receives the given sentence and sorts the words in it in ***ascending*** order and returns the list of sorted words to main.

b) Call a function called ***print_result*** which receives the list of sorted words from the main program and prints them ***without repetition*** to the screen. Each word printed should have the number of times it is repeated in the original sentence printed on the screen next to it as shown in the example below.

Example:

Enter a sentence of up to ten words:
to be or not to be that is the question

Output

be	2
is	1
not	1
or	1
question	1
that	1
the	1
to	2

```
#include <stdio.h>
#include <string.h>
#define S 100
char * sort_words (const char *, char *, 5);
char * print_result ( char *, int );
char  strtok( char *, const char *)
int main ( )
{
char str[100];
char tokptr;
Enter sentence of up to ten words\n");
```

// By: Bara Adnan

*1 حل سؤال:

A
B
C
B
B
B
A
A
D
B

---

*2 حل سؤال:

A) returned value is: 48
B) 7 27 16
 1
74 17 1
17 14 1
3 7
 :5
*حل سؤال

1فائدته انو بوجد حاصل ضرب جميع الاعداد الزوجية المحصورة بين العدد المدخل والعدد 3 (العدد المدخل داخل بالفترة)
--NEW LINE--

4حل سؤال: *

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

// By: Bara Adnan

void sort_words(char [], char [][30], int *);
void print_result(char str[][30], int *);

int main()
{
char *string, wds[10][30];
string = malloc(sizeof(char) * 300);
```

```
int k = 0;
fflush(stdin);
gets(string);
sort_words(string, wds, &k);
print_result(wds, &k);
return 0;
}

void sort_words(char str[], char wds[][30], int *k)
{
char *tok, temp[30];
int i, j;
tok = strtok(str, " ");
while(tok != NULL)
{
strcpy(wds[(*k)++], tok);
tok = strtok(NULL, " ");
}
for (i = 0; i < *k - 1 ; i++)
{
for (j = i + 1; j < *k; j++)
{
if (strcmp(wds[i], wds[j]) > 0)
{
strcpy(temp, wds[i]);
strcpy(wds[i], wds[j]);
strcpy(wds[j], temp);
}
}
}
}

void print_result(char str[][30], int *k)
{
int i, valid, counter, ib;
for(i=0; i<*k;)
{
counter = 1, ib = i, valid = 1;
while(valid)
{
if(strcmp(str[ib], str[++i]) == 0 && i<*k)
counter++;
else
{
printf("%-20s%d\n", str[ib], counter);
valid = 0;
}
}
}
}

// By: Bara Adnan
```