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CEng 230 Final (Group A)

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1. In C, if you pass an array as an argument to a function, what actually gets passed?

- a. First element of the array
- b. Value of elements in the array
- c. Address of the first element of array
- d. Address of the last element of array
- e. An exact copy of the elements of the array

2. Which of the following statements would assign the main diagonal elements of square matrix A of size MxM to 1 and the other elements to 0. For M=4, the resulting matrix is:

1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

- a) for (i=0;i<M;++i) {
 A[i][i]=1;
 A[i+1][i]=0;
 }
 b) for (i=1;i<M;++i)
 for (j=1;j<M;++j)
 if (i != j) A[i][j]=0;
 else A[i][j]=1;
- c) for (i=1;j<=M;i++)
 for (j=1;j<=M;j++)
 A[i-1][j-1]=(i/j)*(j/i);
- d) for (i=0;i<M;++i)
 for (j=0;j<i;++j)
 if (i == j) A[i][j]=1;
 else A[i][j]=0;
- e) for (i=0;i<M;++i)
 for (j=0;j<M;++j) {
 A[i][j]=1;
 A[i/j][j/i]=0;
 }

3. What would be the contents of the array arr after the following code is executed?

```
int arr[4][4] = {{0,0,0,0}, {0,0,0,0}, {0,0,0,0}, {0,0,0,0}};
int i, j;
for (i=0; i<4; i++)
    for (j=i; j<4; j++)
        arr[i][j] = j;
```

a)

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

b)

0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3

c) d)

0	1	2	3
0	1	2	3
0	1	2	3
0	1	2	3

0	1	2	3
0	1	2	3
0	0	2	3
0	0	0	3

e)

0	0	0	0
1	1	0	0
2	2	2	0
3	3	3	3

4. What would be the output of the following code segment?

```
int array[2][2] = {{0, 1}, {2, 3}};
int i, sum = 0, x, y;

for (i=0; i<4; i++) {
    x = i % 2;
    if (x) y = 0;
    else y = 1;
    sum += array[x][y];
}
printf("%d\n", sum);
```

- a) 6 b) 7 c) 8 d) 9 e) 10

5. How many elements will the following array have?

```
int array[3][12][5];
```

- a) 5 b) 60 c) 36 d) 180
- e) This is not a valid array declaration.

6. What would be the contents of the array arr after the following code is executed?

```
int arr[5] = {1, 2, 3};
```

- a) 0 0 0 0 0
- b) 1 2 3 3 3
- c) 1 2 3 0 0
- d) 1 2 3 1 2

e) This code will produce a compile time error

7. What will be output if you will compile and execute the following C code?

```
void main(){
    int array[2][2][3]={0,1,2,3,4,5,6,7,8,9,10,11};
    printf("%d",array[1][0][2]);
}
```

- a) 2 b) 5 c) 6 d) 7 e) 8

8. What will be output of the following C program?

```
#include<stdio.h>
int main(){
    int a[]={6,7,8,9},i;
    compute(a);
    for(i=3;i>=0;i--)
        printf("%d ",a[i]);
    return 0;
}

compute(int *p){
    int i;
    for(i=0;i<4;i++){
        *p=*p-1;
        p++;
    }
}
```

- a) 5 6 7 8 b) 6 7 8 9
 c) 8 7 6 5 d) 9 8 7 6
 e) None of these

9. What is the output of the code below?

```
#include <string.h>
#include <stdio.h>
int main(void) {
    char ar1[25];
    char ar2[10] = "12345";
    strcpy(ar1, "abcdef");
    strncat(ar1, ar2, 4);
    printf("%s\n", ar1);
    return 0;}
```

- a) abcdef1234 b) abcdef12345 c) 1234abcdef
 d) 1234abcd e) 1234

10. What would be the output, after execution of the following code segment?

```
#define MAX 5
void main(){
    int i,ind=0,temp,min=99,t[MAX]={7,2,9,1,5};
    for(i=0;i<MAX;i++) if(t[i]<min) {min = t[i];ind=i;}
    temp=t[MAX/2];
    t[MAX/2]=t[ind];
    t[ind]=temp;
    for(i=0;i<MAX;i++) printf("%d ", t[i]);}
```

- a) 7 2 1 9 5 b) 7 2 9 1 5 c) 1 2 5 7 9
 d) 1 2 9 1 5 e) 5 1 9 2 7

11. What will be the value of array s after execution of the following code?

```
int i,j;
int s[2][2]={3,7,6,2};
int d[2][2]={3,2};
for(i=1;i>=0;i--)
    for (j=0;j<2;j++) s[i][j]= s[i][j]+ d[j][i];
```

- a)

6	9
6	2

 b)

6	7
8	2

 c)

3	10
6	4

 d)

3	10
8	2

e) Error (missing number)

12. What is output of the below program?

```
# include <stdio.h>
int main ( ) {
    int a[1] [1] [1] [1]={1*1*1*1};
    printf("%d ", a [0][0][0][0]);
    return 0;}
```

- a) 1 b) 1 1 1 1 c) 0 0 0 0 d) 0 e) Compilation fails

13. Which of the following is a valid fragment that goes into an infinite loop?

- a) for (x=3;x<10; ++x) a=1;
 b) for (x=10;x!=1; x -=2) a=1;
 c) while (!2) a=1;
 d) x=1; while (x=0) a=1;
 e) while (!(i | !i) a=1;

14. Let X and S denote any C expressions. Then, the below statement is equivalent to:

```
do {X} while (S);
```

- a) while (!S) X;
 b) X;for (X;S;) X;
 c) for (X;;) if (S) X;
 d) X;while (S) X;
 e) while (S) {X;X;}

15. How many stars will be printed by the following code?

```
int i, j;
for (i=0; i<5; i++)
    for (j=10; j>i; j--)
        printf("*");
```

- a) 5 b) 10 c) 40 d) 50 e) Infinite

16. What will be the value of the variable length after the following code is executed?

```
int length = 5;
int count = 4;
while (count <=6) {
    if (length >= 100)
        length = length - 2;
    else
        length = count * length;
    count++;
}
```

- a) 600 b) 100 c) 98 d) 20 e) none of the above

17. How many 1s, 2s, 3s and 4s will be printed after the execution of the following program segment ?

```
sum=0; i=0;
printf("1");
while (i<50) {
    printf("2"); sum++;
    printf("3"); sum++;
    printf("3"); i++;
    printf("4");
}
```

- a) (100 1s), (100 2s), (100 3s) and (100 4s)
 b) (1 1), (50 2s), (100 3s) and (50 4s)
 c) (1 1), (100 2s), (100 3s) and (100 4s)
 d) (1 1), (50 2s), (50 3s) and (50 4s)
 e) (100 1s), (100 2s), (100 3s) and (50 4s)

18. If the following program section is executed, how many times the message "Done" will be printed ?

```
for (i=0; i<5; i++) {
    j=5;
    do { printf("Done");
        j--;
    } while (j <= i);
}
```

- a) None b) 5 c) 9 d) 10 e) Infinite

19. How many times will the statement "printf("%f\n",sqrt(x)) be executed in the following code

```
# include <stdio.h>
#include<math.h>
int main ( ) {
    float x;
    int y;
    for(x=1.0;x<=1.259;x+=0.050)
        {for(y=1;y<=10;++y)
            printf("%f\n",sqrt(x));}
    return 0;}

```

- a) 60 b) 54 c) 77 d) 70 e) 105

20. What is the output of the following program?

```
#include <stdio.h>
int main ( ) {
    int a [5] [5],i,j;
    for (i=0;i<5;i++) {
        for (j=0;j<5;++j) {
            if (i==j) a[i][j]=0; else
                if (i>j) a[i][j]=3; else a[i][j]=2;
            if (i+j==4) a[i][j]=1;}}
    a[2][2]=9;
    for (i=0;i<5;i++) {
        printf("\n");
        for (j=0;j<5;++j)
            printf("%2d ", a[i][j]);}
    return 0;}

```

- a)

0	2	2	2	1
3	0	2	1	2
3	3	9	2	2
3	1	3	0	2

 b)

0	3	3	3	1
2	0	3	1	3
2	2	9	3	3
2	1	2	0	3

- c)

1	2	2	2	0
3	1	2	0	2
3	3	9	2	2
3	0	3	1	2

 d)

0	2	2	2	2
3	0	2	2	2
3	3	9	2	2
3	3	3	0	2

- e)

0	3	3	3	3
---	---	---	---	---

2	0	3	3	3
2	2	9	3	3
2	2	2	0	3
2	2	2	2	0

21. What is the output of below code segment?

```
#include<stdio.h>
int main ( ) { int i,j,sp;
for(i=1;i<=5;++i) {
for(sp=1;sp<=i;++sp)
printf(" ");
for(j=1;j<=6-i;++j)
printf("%2d", j);
printf("\n");
}
return 0;
}
```

```
printf("%3d",i);
for (i=1;i<10;++i) {
printf ("\n");
printf("%3d",i);
for (j=1;j<=i;++j)
if (i>=j) printf("%3d",i*j);
}
return 0;}
```

- a)

1	2	3	4	5
	1	2	3	4
		1	2	3
			1	2
				1
- b)

5	4	3	2	1
	5	4	3	2
		5	4	3
			5	4
- c)

0	1	2	3
	0	1	2
		0	1
			0
- d)

4									
	1	2							
		1	2	3					
			1	2	3	4			
- e)

1	2	3	4	5
1	2	3	4	
1	2	3		
1	2			

22. What does the following program do?

```
#include<stdio.h>
int main ( ) {
int a[10][10],i,j;
printf("\n ");
for (i=1;i<10;++i)
```

- a) Prints a multiplication table of 1 to 9 with proper headings
b) Prints a multiplication table of 1 to 10 with proper headings
c) Creates and prints a two dimensional array of multiplication table from 1 to 9
d) Creates and prints a two dimensional array of multiplication table from 1 to 10
e) Prints upper elements of the diagonal of a multiplication table of 1 to 9

23. Given the below prototype of a function:
*void myfunc(int a, double *b, int M[][]);*
and assuming the declaration:
int A[10], x=4, y=0; double k;
which of the following is a valid call to the function?

- a) myfunc(x+y, &k, &A); b) myfunc(x+y,k,A);
c) myfunc(x,&k,&A[1]); d) myfunc(x,&(k+1),A);
e) myfunc(*x+*y, &k, A);

24. What is the output of the following program?

```
#include<stdio.h>
int fun1(int);
int fun2(int);
int main(){
int j, i=3;
j=fun1(i);
printf("%d ", i);
j=fun2(i);
printf("%d ", i);
return 0;
}

int fun1(int j) {
printf("%d ", ++j);
return j;
}
int fun2(int i){
printf("%d ", i++);
return i;
}
```

- a) 4 4 3 3 b) 4 4 3 4 c) 4 3 3 4 d) 3 4 3 3 e) 4 3 3 3

25. Which of the following program segments completes the following **get_even_pair** function so that it will input two integer values to pass to calling function, where input will force both of these inputs to be even numbers. In other

words, entering an odd number will cause both numbers to be rejected and the user is requested to input a new pair.

```
void get_even_pair(int *a, int *b) {  
    ...  
}
```

- a) do
scanf("%d %d",&a,&b);
while (*a % 2 || *b%2);
- b) do
scanf("%d %d",&a,&b);
while (a % 2 || b%2);
- c) do
scanf("%d %d",a,b);
while (a % 2 || b%2);
- d) do
scanf("%d %d",a,b);
while (*a % 2 || *b%2);
- e) do
scanf("%d %d",&a,&b);
while (*a % 2 && *b%2);

26. A call to the function:

```
void swap(int a, int b) {  
    int temp;  
    temp=a;  
    a=b;  
    b=temp;  
}
```

- a) Only can assign first actual parameter to the second
- b) Only can assign second actual parameter to the first
- c) Is not useful at all
- d) Swaps the contents of two actual parameter
- e) Causes a run-time error.

27. What is the purpose of the following function:

```
double secret(int A[][10], double *B, int sr, int sc) {  
    int a, b; /* sr: number of rows sc: columns of matrix A */  
    double s=0.0;  
    for (a=0;a<sc;++a) {  
        B[a]=A[0][a];  
        s +=A[0][a];  
        for(b=1;b<sr;b++) {  
            B[a] +=A[b][a];  
            s +=A[b][a];  
        }  
        B[a] /=sr;}  
    return(s/(sr*sc));}
```

- a) It calculates the average of each row of a matrix A, stores them into one dimensional array called B, and also calculates and returns the average of all values in A.

- b) It calculates the average of each column of a matrix A, stores them into one dimensional array called B, and also calculates and returns the average of all values in A.
- c) It calculates the average of each column of a matrix A, stores them into one dimensional array called B, and also calculates and returns the sum of all values in A.
- d) It finds out the maximum value of each row of a matrix A, stores them into one dimensional array called B, and also calculates and returns the average of all values in A.
- e) It calculates the averages of each column and each row of a matrix A, stores the them into one dimensional array called B, and also calculates and returns the average of all values in A.

28. What is the output of the following program?

```
void main(){  
    int total;  
    total=sum(2);  
    printf("%d",total);  
}  
int sum(int i) {  
    static int even=0;  
    if(i<=20) {  
        even=even+i;  
        sum(i+2);  
    }  
    return even;  
}
```

- a) 110 b) 55 c) 0 d) 2 e) Infinite Loop

29. What will be output when you execute following C code?

```
#include<stdio.h>  
void main(){  
    const int *p;  
    int a=10;  
    p=&a;  
    printf("%d",*p);  
}
```

- a) 0 b) 10 c) Garbage value e) Any memory address
- e) Error: Cannot modify const object

30. What is printed by the program below?

```
#include <stdio.h>
int jf(int m) {
    printf ("%d\n",m);
    return m;}
int main (void) {
    int k=6,m=4;
    printf ("%d\n",jf(k));
    return 0; }
```

- a) 6 b) 4 c) 4 d) 6 e) 6
 6 4 6 4 5

31. What is the output of this program?

```
#include <stdio.h>
void Eliminate_One_Row(int Ary[ ][3], int r, int N) {
    int j;
    for (j=0; j<N; j++) {
        Ary[r][j] -= Ary[r][0] / Ary[0][0] * Ary[r-1][j];
    }
}
int main(void) {
    int A[3][3]={3,2,1,6,5,4,9,8,7}, row, j;
    for(row=1; row<3; row++) {
        Eliminate_One_Row(A, row, 3);
        for (j=0; j<3; j++)
            printf("%2d", A[row][j]);
        printf("\n");
    }
}
```

- a)0 5 4 b)0 1 2 c)4 5 6 d)0 1 2 e)4 5 6
 9 -7 -5 9 8 7 7 8 9 7 8 9 0 2 4

32. 10. How many * will be printed by below program?

```
#include <stdio.h>
void f(int *a, int c);
void g(int *a, int c);
void f(int *a, int c) {
    printf("*");
    *a=*a-1;
    g(a, c);
}
void g(int *a, int c) {
    if(*a==0) return;
    f(a, c);
}
int main(void) {
    int x=4, y=4;
    f(&x, y);
}
```

- a) 1 b) 2 c) 3 d) 4 e) Infinitely many

33. What is the output of below program?

```
#include <stdio.h>
char g(int *a, int c) {
```

```
char f(int *a, int c);
char g(int *a, int c);
char f(int *a, int c) {
    *a=*a-1;
    g(a, c);
    return c;
}
if(*a==0) return c;
f(a, c);
int main(void) {
    int x=4, y=3;
    y=f(&x, y);
    printf("%d %d", x, y);
}
```

- a) 4 3 b) 3 3 c) 3 0 d) 0 0 e) 0 3

34. What is the purpose of the function f2?

```
int f2(int x [ ],int n) {
    int i;
    for(i=0;i<n/2;i++)
        if(x[i]!=x[n-1-i]) return 0;
    return 1;}
}
```

- a) Returns 1 if the array index is even
 b) Checks whether the array is descending order
 c) Returns 0 if all elements are equal
 d) Checks whether the array is palindrome
 e) Returns 0 if all numbers up to the middle index are equal

35. What would be the output of the following code segment?

```
char myStr[100];
printf("Please enter a string:\n");
scanf("%s", myStr);
printf("%d", strlen(myStr));
```

if the user has entered:

H	e	l	l	o		W	o	r	l	d	!
---	---	---	---	---	--	---	---	---	---	---	---

as input (each character entered is displayed in a box).

- a) 5 b) 6 c) 11 d) 12 e) 13

36. What will the output of following code?

```
int i = 0;
char c = '0';
if (i == c)
    printf("Equal");
```

```
else  
    printf("Not Equal");
```

- a) Equal b) Not Equal c) compile error
d) run-time error e) prints nothing

37. Assume that a 3-dimensional array has been used to represent the content of a history book with 100 pages (50 lines/page, 80 characters/line).

```
char HistoryBook[100][50][80];
```

Assume that 1 byte is sufficient to hold 1 letter of this book, What is the maximum size of this book (in letters)?

- a) 100 b) 400000 c) 400K d) 399999 e) 100000

38. Assume that you are asked to write a function to check if the input string, to the function, contains a web address that belongs to Turkey domain (tr) or not.

The function should return : 1 if the web address belongs to TR domain, 0 otherwise. The function prototype will be :

```
int BelongsToTR(char *url);
```

Which of the following codes can implement this function correctly?

- a) { if(strstr(url, ".tr") != 0) return 1;
else return 0; }
b) {if(strstr(url, "+90") != NULL) return 1;
else return 0; }
c) {if(strstr(url, ".tr") != NULL {
if (strlen(url) == 3+strstr(url, ".tr")) return 1;
}
d) { if (strncmp(url, ".tr") > 0) return 1;
else return 0;}
e) {int len=strlen(url);
if(strstr(url, ".tr") != NULL) {
if (url[len-3]=='.' && url[len-2]=='t' && url[len-1]=='r') return 1;
}
return 0;}

39. What will be displayed by the following program ?

```
void Frequency (char *s, int *L, int *C) {
```

```
*L=0; *C=0;  
while (*s != '\0') {  
if (*s=='a' || *s=='e' || *s=='i' || *s=='o' || *s=='u')  
(*L)++;  
if (*s=='A' || *s=='E' || *s=='I' || *s=='O' || *s=='U')  
(*C)++;  
s++;}}  
int main(void) { int l, c;  
char sentence[] = "It is an honor to be a METU student.";  
Frequency(sentence, &l, &c);  
printf("\n %d %d %d", c, l, strlen(sentence));  
return 0;  
}
```

Note : There is one space character between the words of the sentence.

- a) 3 9 36 b) 3 8 37 c) 9 2 37 d) 36 3 9 e) 37 3 8

40. strcpy copies all the elements of the second argument (t) including the null character into the first argument (s). A valid strcpy can be coded as follows:

```
void strcpy (char *s, char *t) {  
while ((*s = *t) != '\0') {  
s++; t++;  
}  
}
```

Which of the while loop is equivalent to the same structure above?

- a) while ((*s++ = *t++) != '\0');
b) while (&s == &t)
{ *s = *t; s++; t++;}
c) while ((source++ = dest++) != NULL)
{ s[i] = t[i];}
d) while (s++ == t++)
s = t;
e) while (s-- == t++)
s = t;

41. What is the output of the following code?

```
#include <stdio.h>  
#include <string.h>  
void main() {  
char *s1="mystring",s2[9];  
strcpy(s2,s1);  
strcat(s1, "s!");
```

```
printf("%s",s2);}
```

- a) mystrings b) mystrings! c) mystring
d) Error (array boundary) e) Error (syntax)

42. What will be the output of the following code segment?

```
char st1[]="can you hear the voice?";  
char st2[]="we must call the police!";  
strcpy(st2+8,st1+8);  
if(strncmp(st1+7,st2+7,8)==0) printf("%s",st2);  
else printf("%s",st1);
```

- a) "can you call the police!"
b) "can you hear the police!"
c) "we must call the police!"
d) "can you hear the voice?"
e) "we must hear the voice?"

43. What is output when you execute following C code?

```
#include<stdio.h>  
void main(){  
int m=2,n=8,q=24;  
if(--q/n-m)  
printf("William Gates");  
else  
printf(" Warren Buffet");  
printf(" Carlos Slim Helu");  
}
```

- a) William Gates
b) Warren Buffet Carlos Slim Helu
c) Warren Buffet
d) William Gates Carlos Slim Helu
e) Compilation Error

44. What is output when you execute following C code?

```
#include<stdio.h>  
void main(){  
int a=10;  
if(printf("%d",a>=10)-10)  
for(;;)  
break;  
else;  
}
```

- a) Nothing b) 0 c) 1 d) compile error e)infinite loop

45. What is output of following C code?

```
#include<stdio.h>  
void main(){  
int check=2;  
switch(++check){  
case 1: printf(" D.W.Steyn");  
case 2: printf(" M.G.Johnson");  
case 3: printf(" M. Asif");  
default: printf(" M.Muralidaran");  
}  
}
```

- a) M. Asif M.Muralidaran
b) M.Muralidaran
c) M.G.Johnson
d) M. Asif
e) M.G.Johnson M. Asif M.Muralidaran

46. What will be the value of z after execution of the following code?

```
z=4;x=0;  
switch (--z){  
case 4: x=2; break;  
case 3: x=3;  
case 2: x=4;  
default: x=5;}
```

- a) 5 b) 4 c) 3 d) 2 e) 0

47. What is the output of the following segment?

```
# include <stdio.h>  
int main ( ) {  
int a=1, b=2, c=3;  
if (a==b)  
if (b==2) c = c + 1;  
else c = c - 1;  
else  
if (b != 2) c = c + 2;  
printf ("\n C= %d", c);  
return 0;}
```

- a) C=3 b) C=4 c) C=2 d) C=5 e) C=8