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| **Code** | Output |
| **//5 pts**  int a[3][3] = {1} ;  for (i=0; i<3 ; i++)  for(j=0; j<3 ; j++)  if( i > j)  a[i][j] = a[i][j] + i-j ;  else if( i<j )  a[i][j] = a[i][j] + i+j ;  else  a[i][j] = a[i][j] + i\*i;  for (j=0; j<3; j++){  for (i=0; i<3; i++)  printf("%d ",a[i][j]);  printf("\n");  } | **1 1 2**  **1 1 1**  **2 3 4** |
| **//2 pts**  int a[2][2] = {1,2,3} ;  for (i=0; i<2 ; i++)  for(j=0; j<2 ; j++)  a[1][1] += a[i][j];  for (i=0; i<2; i++){  for (j=0; j<2; j++)  printf("%d ",a[i][j]);  printf("\n");  } | **1 2**  **3 12** |
| **//3 pts**  char \*f = "Taha,";  char \*b = "Moha\nad";  char str[80];  strcpy(str, "welcome ");  strcat(str, f);  strcat(str, b);  puts(str);  printf("%s", strtok(str, ","));  puts(str); | **welcome Taha,Moha**  **ad**  **welcome Tahawelcome Taha** |

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| **//4 pts**  #include<stdio.h>  #include<string.h>  int myfun(char \*str){  int res=0, i ;  for(i=1 ; i<strlen(str); i++){    res =res+ res \*10+(str[i] - '0');  printf("%d\n",res);  }  if(str[0] == '-')  res = -res;  return res;  }  int main(){  char str[] = "-123";  printf("%d", myfun(str));  return 0;  } | **1**  **13**  **146**  **-146** |

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| int arry[][4] = {{5, 12, 8, 15},  {9, 6, 4, 2}, {3, 7, 1, 10}}, k, m;  for(m = 2; m >= 0; m--){  for(k = 2; k >= 0; k--){  printf("%d ", arry[2 - k][3 - m]);  }  printf("\n");  } | //5 pts  **12 6 7**  **8 4 1**  **15 2 10**  Each correct answer is worth of 0.5 points. For correct format 0.5 point. |
| What is the output if the input file contains:  **ICS 103 is a programming course**  FILE \*inptr;  inptr = fopen("input.txt", "r");  char str1[128], str2[128];  fscanf(inptr, "%s", str2);  fgets(str1, 4, inptr);  puts(str1);  printf("%s", str1);  printf("%s", str2); | // 3 pts; 2 + 1 for format  10  10ICS |
| #include<stdio.h>  #include<string.h>  int main(void){  int i;  char users[10][50], \*token;  char data[50] = "Admin\*User1@\*User2\*%@";  char delims[] = "\*@%" ;  token = strtok(data, delims);  i = 0;  while(token != NULL){  strcpy(users[i], token) ;  puts(users[i]) ;  i++;  token = strtok(NULL,delims);  }  printf("%d", i) ;  return 0;} | // 5 pts; 4 + 1 for format  Admin  User1  User2  3 |

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| [3 points]  What is the output if the input is:  DHAHRAN IS COLD TODAY  char str1[81], str2[81];  scanf("%s", str1);  gets(str2);  printf("%s", str2);  puts(str1);  printf("%s", str1); | Output:  **IS COLD TODAYDHAHRAN**  **DHAHRAN** |
| [5 points]  int matrix[][4] = {{5, 12, 8, 1},  {9, 5, 4, 2}, {3, 7, 1, 4},  {11, 20, 13, 16}}, k, m;  for(m = 2; m >= 0; m--){  for(k = 2; k >= 0; k--){  printf("%2d ",matrix[m][k]+ matrix[k][3]);  }  printf("\n");  } | Output:  **5 9 4**  **8 7 10**  **12 14 6** |

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| [7 points]  #include <stdio.h>  #include <strings.h>  int main(void) {  char strings[][80]  = {"THIS", "IS", "THE", "BEST"};  int k, m;  for(k = 0; k <= 3; k++){  for(m = strlen(strings[k]) - 1; m >= 0; m--){  printf("%c", strings[k][m]);  }  printf("\n");  }  printf("\n");  for(k = 0; k <= 2; k++){  strcat(strings[k], strings[k + 1]);  }  for(k = 0;k < 4; k++)  puts(strings[k]);    return 0;  } | Output:  **SIHT**  **SI**  **EHT**  **TSEB**    **THISIS**  **ISTHE**  **THEBEST**  **BEST** |

1. What will be shown on the screen as a result of executing the following program?

#include<stdio.h>

int main() {

int i, j;

int x[3][3]={{1,2,3},{4},{5,6}};

for(j=2;j>=0;j--)

for(i=0;i<=2;i++)

printf("%d",x[i][j]);

return 0; }

1. 560400123
2. 321004065
3. 300206145
4. None of the above is true
5. What is the output of the following program?

#include<stdio.h>

int main(){

char s[] = "Hello\0Hi";

printf("%d %s", strlen(s),s);

}

1. 5 Hello
2. 5 Hello\0Hi
3. 9 Hello\0Hi
4. 8 Hello\0Hi

3. Given the program below, we would like to insert a new statement, after the statement **p = &array1[2][2]**,

that would assign the integer value 5 to the 2-D array element indexed by row # 2 and column # 2:

**#include<stdio.h>**

**#define ROWS 3**

**#define COLS 3**

**int main(void) {**

**int array1[ROWS][COLS] ;**

**int \*p ;**

**p = &array1[2][2] ;**

**----------------------------- // new statement to be inserted here**

**printf(“%d”, array1[2][2]) ;**

**return 0;**

**}**

Which of the following answers is the best?

A. array1[2][2] = 5 ;

B. \*p = 5 ;

C. array1[ROWS-1][COLS-1] = 5 ;

**D. All of the above are correct. D**

E. None of A, B, and C are correct.

4. An integer 2-D array, **arr,** has 4 rows and 3 columns. Which of the following will correctly initialize all **arr** elements to 1?

A. **int arr[4][3] = {1} ; C**

B. **int arr[4][3] = { {1} , {1} , {1} , {1} } ;**

**C. int arr[4][3], i, j; for(i=0; i<4; i++) for(j=0; j<3; j++) arr[i][j] = 1;**

D. **int arr[4][3], i, j; for(j=0; j<3; i++) for(i=0; i<4; j++) arr[j][i] = 1;**

E. None of the above is correct.

8. A 2-D array **A** has **m** rows and **n** columns, and a 2D-array **B** has **x** rows and **y** columns. To get the absolute

value of the difference (subtraction) of all the elements of **A** minus **B**, or, mathematically, to compute

**|A – B|** which one of the following statements must be true regarding the number of rows and columns of

the two arrays?

A. x == m and y == m

**B. x == m and y == n B**

C. x == n and y == n

D. x == n and y == m

E. None of the above is correct.

1. What is the output of the following program?

**#include<stdio.h>**

**#include<string.h>**

**int main(void) {**

**char string1[] = "CE 324";**

**char string2[] = "ME 101";**

**if(strcmp(string1,string2) == 0)**

**printf("A") ;**

**else if (strcmp(string1,string2) > 0)**

**printf("B") ;**

**else**

**printf("C") ;**

**return 0;**

**}**

A. A

B. B

**C. C C**

D. The information given is not sufficient to give an answer.

E. None of A, B, and C is correct.