The Open University of Sri Lanka
Faculty of Natural Sciences
B.Sc/ B. Ed Degree Programme

Department	**: Computer Science**
Level	**: 03**
Name of the Examination	**: Final Examination (1st Semester)**
Course Title and - Code	**: Introduction to Computer Programming - CSU3200**
Academic Year	**: 2023/2024**
Date	**: 11.10.2023**
Time	**: 1.30 pm -3.30 pm**
Duration	**: Two hours only**

General Instructions

1. Read all instructions carefully and use only the given answer book to provide answers. Do not use the question paper to write down answers.
2. This question paper consists of **(06)** questions in **(08)** pages.
3. Answer any **(04)** questions only. All questions carry equal marks.
4. Answer for **each question** should commence from a **new page**.
5. Draw fully labelled diagrams where necessary.
6. Involvement in any activity that is considered as an exam offense will lead to punishment
7. Use blue or black ink to answer the questions.
8. Clearly state your **Index Number** in your answer script

Question No. 1

1.1. What is the output of the **Line no: 10, 11, 12, 13, 14, 15 and 16** of the following program?

```
1.  #include <stdio.h>
2.  main()
3.  {
4.  int a;
5.  char b;
6.  float c, mul, div;
7.  a = 10;
8.  b = 66;
9.  c = 20;
10. printf("The value of a = %d \n",a);
11. printf("The value of b = %c \n",b);
12. printf("The value of b = %d  \n",b);
13. printf ("The value of c = %f \n",c);
14. printf ("The value of multiplication = %f  \n ", a*c);
15. printf ("The value of division = %f  \n ", a/c);
16. printf ("The balance of the division = %d  \n ", a%3);
17. return 0;
18. }
```

(14 Marks = 7*2)

1.2 If **c = 0**, what is the output of line number **14** of the program in 1.1 above? Explain your answer.

(2 Marks)

1.3 Use the following program to answer the questions given below.

```
1. #include<stdio.h>
2. #define pi 3.14159
3. main()
4. {
5. float r;
6. printf("\n Enter the radius  in mm :");
7. scanf ("%f", &r);
8. printf("\n The perimeter is  %.2f" ,2*pi*r) ;
9. getch();
10. }
```

1.3.1 Explain line number 2.

(2 Marks)

1.3.2 Write down the same declaration in line number 2, after the main() function of the program to define the same **Data** type.

(2 Marks)

1.4 State whether the following variable declarations are valid or invalid. Give reasons for the invalid declarations (the variables are in bold for your convenience).

1. char **middle_initial**;
2. integer **num_dependents**;
3. float **reg_hours**;
4. double **gross_pay**;
5. char **union**;

(5 Marks)

Question No. 2

2.1 Write the data type of each of the following identifiers.

(i) amount, where amount = 100.00
(ii) number, where number = 100
(iii) name, where name = D
(iv) gross-pay, where gross-pay = 400.50
(v) traffic_light, where traffic_light = {red, yellow, green}

(10 Marks)

2.2 When a C program begins execution, three stream files named **stdin, stdout, stderr** will automatically open. These files are defined in the standard input/output library (stdio.h).

Explain the purpose of these **three (3) files separately**, when you are executing your programmes.

(6 Marks =2*3)

2.3 Use the following program to answer the questions given below.

```
1. #include<stdio.h>
2. main( )
3. {
4. char response;
5. printf("Enter Your First Name:");
6. response = getchar();
7. putchar('\n');
8. printf("First Letter of your name is: ");
9. putchar(response);
10. putchar('\n');
11. }
```

Write down the output of the following line numbers:

Line no: 5, 6, 7, 8, 9 and 10

(6 Marks)

2.4 Write-down the appropriate **input/output function or program segment or** statement for the following requirements.

(i) To read a **string(emp_name)** from the keyboard with spaces.

(ii) To display a **string "Enter the name of the staff Member"** on the VDU.

(iii) To read a value for x, where **x** is a **decimal integer**.

(3 Marks)

Question No. 3

3.1 What will be the output of the following statements, when **x** = 7 and **y** = 3?

a) x += y ;

b) x -= y ;

c) x *= y ;

d) x /= y ;

e) x %= y ;

(5 Marks)

3.2 Fill in blanks in the Statement 2 by referring to Statement 1:

Statement1 : z = (x > y) ? x : y ;

Statement 2 :

```
if (x …….. y)
      ……   = …………..;
else
      ……….. = ………   ;
```

(5 Marks)

3.3 Evaluate the following expressions (you need to show the necessary calculations you did to get the answer).

(i) 4 + 3 * 2 – 6 / 2
(ii) (4 + 3) * 2 – 6 / 2
(iii) (4 + 3 * 2 – 6) / 2
(iv) ((4 + 3) * 2 – 6) / 2
(v) (4 % 3) * (2 – 6) / 2

(5 Marks)

3.4 Write down the output of the following program in each line.

```
1. #include <stdio.h>
2. int main (void)
3. {
4. int t;
5. for (t=0; t < 100; t++) {
6. printf("%d ", t);
7. if (t == 10)
8. break;
9. }
10. getch();
11. return 0;
12. }
```

(10 Marks)

Question No. 4

4.1 State whether the following Array declarations are **Valid** or **Invalid**,

1. int marks[100];
2. float salary[20];
3. int a[10], b[20];
4. int age[5]={67,45,23,56,89};
5. int age[]={67,45,23,56,89};

(5 Marks)

4.2 State the output of the line numbers **6 ,7,8**, and **19** in the following single array:

(4 Marks)

```
1. #include <stdio.h>
2. void main()
3. {
4. int arr[10];
5. int i;
6. printf("\n\nRead and Print elements of an array:\n");
7. printf("----------------------------------------\n");
8. printf("Input 10 elements in the array :\n");
9. for(i=0; i<10; i++)
10. {
11. printf("element - %d : ",i);
12. scanf("%d", &arr[i]);
13. }
```

```
14. printf("\nElements in array are: ");
15. for(i=0; i<10; i++)
16. {
17. printf("%d  ", arr[i]);
18. }
19. printf("\n");
20. }
```

4.2.1 How many values can be stored in this array?

(1 Marks)

4.2.2 Explain the purpose of the line numbers, **8** to **13**.

(3 Marks)

4.2.3 Explain the purpose of line numbers, **14** to **18**.

(3 Marks)

4.3 There are two variables to be stored in a two-dimensional array and it should be declared.

The following array can be declared as:

int marks [4] [3];

56	78	90
92	54	87
100	98	87
76	50	60

Write down the elements of the following locations by using the above two-dimensional array:

a) element - [0],[0] :
b) element - [0],[3] :
c) element - [2],[2] :
d) element - [2],[3] :
e) element - [1],[1] :
f) element - [1],[2] :
g) element - [2],[0] :
h) element - [2],[1] :
i) element - [2],[2] :

(9 Marks)

Question No. 5

5.1 what is the output of the line numbers **9** and **11** of the following program?

(4 Marks)

```
1. #include <stdio.h>
2. #include <string.h>
3. #define M1   "Good luck!"
4. char M2[40] = "work hard" ;
5. int main(void)
6. {
7. char words[80];
```

```
8. strcpy(words,M2);
9. puts(words);
10. strcat(words, " & win the  Awards ");
11. puts(words);
12. return 0;
13. }
```

5.2 What are the two fundamental operations used with pointers?

(2 Marks)

5.3 There is an integer type variable named c (int c) and an integer type pointer named pc (int *pc) which contains the address of the memory location of the variable c. Mention whether the following statements are true or false.

i) pc = c;

ii) pc = &c;

iii)*pc = &c;

iv) *pc = c;

(4 Marks)

5.4 What will be the output of the following program?

(6 Marks)

```
#include <stdio.h>
int main()
{
   union var
   {
      int num1;
      int num2;
   };
   union var cal;
   cal.num1 = 50;
   printf("%d\n", cal.num1);
   cal.num2 = 25;
   printf("%d\n", cal.num2);
   printf("%d\n", cal.num1);
   return 0;
   }
```

5.5 Refer the following program to answer the questions given below:

```
1  #include<stdio.h>
2  int main ()
3  {
4  void swap (int, int );
5  int a, b ;
6  printf("Enter two integers <a ,b> : ");
7  scanf("%d %d", &a, &b);
8  swap(a,b);
9  return 0;
10 }
11 void swap(int x, int y)
```

```
12 {
13 int temp;
14 printf(" Value of x and y in swap before exchange :%d %d : " ,x,y);
15 temp = x;
16 x = y;
17 y = temp;
18 printf("\nValue of x and y in swap after exchange :%d %d ",x,y);
19 }
```

5.5.1 Write down the function prototype (function declaration) of the above program. **(2 Marks)**

5.5.2 Write down the name of the calling function. **(2 Marks)**

5.5.3 What is the return value of the function? **(1 Mark)**

5.5.4 If **a=20** and **b=50**, what is the output of the line numbers **14** and **18?** **(4 Marks)**

Question No. 6

6.1 Use the following program segment to answer the following question.

```
1. #include <stdio.h>
2. int main(void)
3. {
4. struct employee {
5. int start_year;
6. int dpt_code;
7. int id_number;
8. } info;
9. info.start_year = 1997;
10. info.dpt_code = 8;
11. info.id_number = 1234;
12. printf("Start Year: %d\n",  .....);
13. printf("Dpt. Code: %d\n",  .... ...);
14. printf("ID Number: %d\n",  .....);
15. return 0;
16. }
```

Fill in the blanks in the line numbers **12,13** and **14 to output the details of the employee.** **(6 Marks)**

6.2 What are the four storage classes in C language? **(4 Marks)**

6.3 Answer the following questions using the statement below.

fopen("E\\Cprogram\\myfile.txt", "w");

a) What is the purpose of the function '**fopen**'?

b) What is the filename?

c) What type of file is it?

d) What is the file opening mode?

e) What is the location of the file?

(5 Marks)

6.4 State three (3) types of errors that could be available in your program by providing an example.

(3 Marks)

6.5 State **four (4)** dynamic memory allocation functions.

(4 Marks)

6.6 Explain the following expressions in file handling?

a) **fopen("test.bin", "r+b")**
b) **fopen("test.txt" "a")**
c) **fopen("test.ini", "w+")**

(3 Marks)

******* End *******