DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF MANAGEMENT AND INFORMATION SCIENCES
THIRD SESSIONAL EXAMINATION
SUBJECT: ALGORITHM DEVELOPMENT AND PROGRAMMING FUNDAMENTALS

Examination	**: M.C.A. - Semester - I**	**Seat No.**	**:**
Date	**: 22/02/2021**	**Day**	**: Monday**
Time	**: 09:00 AM To 10:15 AM**	**Max. Marks**	**: 36**

INSTRUCTIONS:

1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed. **[12]**

1) What will be the output of the following C code?

```
#include <stdio.h>
void foo ()
{
   return 1;
}
void main()
{
   int x = 0;
   x = foo ();
   printf ("%d", x);
}
```

a) Runtime Error
b) 0
c) 1
d) Compile Time Error

2) The library function strrchr () finds the first occurrence of a substring in another string.

a) True
b) False

3) What will be the output of the following C code?

```
int func ()
{
   return (double)(char)5.0;
}
```

A) double
B) int
C) char
D) Multiple casting type warning
E) compile time error

4) What will be the output of the following C code?

```
#include <stdio.h>
double mars ();
int main ()
{
   mars ();
   return 0;
}
mars ()
{
   printf ("2 ");
   return 2;
}
```

a) 2
b) Compile time error
c) Compile time warning only
d) Run time error

5) What will be the output of the following C code?

```
#include <stdio.h>
int x;
void main ()
{
   int y;
   printf ("x=%d and y=%d", x, y);
}
```

A) x and y will be assigned default values
b) x and y will be assigned junk values
c) x will be assigned default value and y may contain junk values
d) x will be unassigned and y may contain junk values

6) What will be the output of the following C code?

```
#include<stdio.h>
main ()
{
        char str1[] ="hello ddu", str2[] ="hello ddu";
         if (str1 == str2)
                printf ("equal strings");
        else
                printf ("not equal strings");
}
```

a) equal strings
b) Compile time error
c) not equal strings
e) blank output
d) None of the mentioned

7) What will be the output of the following C code?

```
#include<stdio.h>
#include<string.h>
void main ()
{
   char p [40];
   char s [40] = "Students";
   int length = strlen(s);
   int i;
   for (i = 0; i < length; i++)
       p[i] = s [length - i];
   printf ("%s", p);
}
```

a) stnedutS
b) stnedut
c) Students
d) blank Output
e) compile time error

8) Consider the following C function. What will be the return value for f (1)?

```
int f (int n)
{
  static int i = 1;
  if (n >= 5)
    return n;
  n = n+i;
  i++;
  return f(n);
}
```

a) 5
b) 6
c) 8
d) 7

9) typedef can be declared local to a function or a block (i.e. as per scope rules) whereas #define always have a global effect.

a) True
b) False

10) What will be the output of the following C code?

```
#include <stdio.h>
union p
{
   int x;
   char y;
}k = {1, 97};
int main ()
{
   printf ("%d\n", k.y);
 }
```

a) 97
b) compile time error
c) run time error
d) 1
e) garbage value

11) The #include directive
A) Tells the preprocessor to grab the text of a file and place it directly into the current file
B) Statements are not typically placed at the top of a program
C) All of the mentioned
D) None of the mentioned

12) What will be the output of the following C code?

```
#include <stdio.h>
int main ()
{
      int num1 = 5;
      int num2 = 3;
      int num3 = 2;
      num1 = num2++;
      num2 = --num3;
      printf ("%d %d %d", num1, num2, num3);
      return 0;
}
```

A) 2 3 1
B) 3 1 1
C) 3 2 7
D) 3 2 1

Q.2 Attempt Any Three of the following questions. **[12]**

(a) List and Explain different storage classes for variables in C.

(b) Explain multidimensional array in C. Discuss how the memory is represented for 2-D array.

(c) Write a C program to check whether a given number (N) is a perfect number or not?

(d) Use recursive method to write a C program to calculate length of the string.

Q.3 Do as Directed: **[12]**

(a) Create an array of students using structures, where in each entry of the student will have the following fields: [8]

- a name, which is a string with at most 128 characters
- their marks in physics which is an int between 0 and 100
- their marks in chemistry which is an int number between 0 and 100
- their marks in mathematics which is an int number between 0 and 100

Write a program to collect data from user, print the data with total marks and percentage. Also give user option to filter students based on marks of particular subject. Use functions wherever applicable.

(b) What is the difference between structure and union? Explain with example. [4]

OR

Q.3 Do as Directed: **[12]**

(a) Write a C program to find sum of all digits using recursion. Also trace your recursive function for any input of minimum 4 digits. [8]

(b) Discuss union keyword in C. Also provided suitable examples. [4]