1) How can we use the getchar() function to read multicharacter strings?
2) What is the output of C program if input is 'S'?

```
int main()
{
   char ch='A';
   ch=getchar();
   putchar(ch);
   return 0;
}
```

A) A

B) B

C) S

D) Compiler error

3) What is the output of c program with %* operator.?

```
#include<stdio.h>

int main()

{

        char ch;
        scanf("%*c %c",&ch);
        putchar(ch);
        return 0;

}//input=G H
```

A) G

B) H

C) A

D) Compiler error

4) How many times the suite of the loop is executed when the input is chocolate with enter key?Will the execution of code get terminated after this? THINK!

```
#include<stdio.h>
int main()
{
char d;
int i = 0;
while ((d=getc(stdin)) != '\t')
{
  printf("hello\n");
}
}
```

Functions

1. Names of parameters in a function prototype have to match the names given in the function definition. TRUE/FALSE

2. Briefly explain about function prototypes.

3. Write a function named int zeroCheck(int a, int b, int c); that is given three integers, and returns 1 if any of the integers is 0, otherwise it returns 0.

4. Write a function: char getContinue(); that displays to the user "Do you want to continue (y/n): ", and continues to prompt the user until either uppercase or lowercase 'y' or 'n' is entered, returning (lowercase) 'y' or 'n' as the function return value.

5. Write a function check(x, y, n) that returns 1 if both x and y fall between 0 and n-1 (both inclusive). The function should return 0 otherwise. Assume that x ,y and n are all of type int.

6. Write a function day_of_year(month, day ,year) that returns the day of the year (an integer between 1 and 366) specified by three arguments.

7. Write a function num_digits(n) that returns the number of digits in n (a positive integer)

8. Write a function digit(n, k) that returns the k^{th} digit (from the right) in n (a positive integer). For example, digit(829, 1) returns 9. Digit(829, 2) return 2 and digit(829, 3) returns 8. If k is greater than the number of digits in n, have the function return 0.

9. What is the output for the following code:

```
#include <stdio.h>
int what(int a, int n)
{
        if(n == 0)
                return 1;
        else if(n % 2)
                return a * what(a * a, n / 2);
        else
                return what(a * a, n / 2);
}
```

```
int main()
{
        int a = 3, b = 5;
        printf("%d\n", what(a, b));
}
```

10. Which of the following would be valid prototypes for a function that returns nothing and has one double parameter?
    a. void f(double x);
    b. void f(double);
    c. void f(x);
    d. f(double x);

11. Write functions that return the following values. (Assume that a and n are parameters, where a is an array of int values and n is the length of the array)
    a. The largest element in a
    b. The average of all elements in a
    c. The number of positive elements in a

12. Write the following function:
    float compute_GPA(char grades[], int n);
    the grades array will contain letter grades (A, B, C, D, or F, either uppercase or lowercase); n is the length of the array. The function should return the average of the grades (assume that A = 4, B = 3, C = 3, D = 1, and F= 0)

13. Write a function to solve the Tower of Hanoi problem using recursion.

14. Write a program to find the gcd of 2 numbers using recursion.

15. Write a program to find the number of digits in an interger using recursion.
    int length(int n);
    length(892) will return 3
    length(3452) will return 4.

1 Define pointer. How can you declare and initialize it.
6. Write a C program to illustrate the use of indirection operator to access the value pointed by a pointer.
7. What are the features of pointers? Write a C program to print address of a variable
8. With proper examples explain different arithmetic operations on pointers.
9. Write a C program to show that pointer of any data type occupies same space.
10. Write a C program to read and print an array of elements using pointers

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6. Write a C program to read and print an array of elements using pointers
7. What is (void*)0 ?
8. What will be output of following program? #include int main() { int a = 5,b = 10,c; int *p = &a,*q = &b; c = p-q; printf("%d",c); return 0; }
9. What will be output of following program? #include int main() { int a = 320; char *ptr; ptr =(char *)&a; printf("%d",*ptr); return 0; }
10. What will be output of following program? #include int main() { int a = 10; void *p = &a; int *ptr = p; printf("%u",*ptr); return 0; }
11. Explain the difference between array and pointers

1. Write a declaration of an array named weekend containing seven Bool values. Include an initializer that makes the first and last values true; all other values should be false.
2. The Fibonacci numbers are 0, 1, 1, 2, 3, 5, 8, 10…, where each number is the sum of the preceding two numbers. Write a program fragment that declares an array named fib_numbers of length 40 and fills the array with first 40 Fibonacci numbers.
3. Why do array subscripts starts at 0 instead of 1?
4. Define an array. How to initialize one-dimensional array? Explain with suitable examples.
5. Write a C program to sort the given array elements in Ascending order.
6.Write a C program to read N integers into an array A and to find the (i)sum of odd numbers,(ii) sum of even numbers,(iii) average of all numbers. Output the results computed with appropriate headings
7. Write a C program to search an element using linear and binary techniques
8. Write a C program to find the largest element in an array
9. Write a program to convert a given integer into a string which has the binary equivalent of the number. Example: Assuming that an integer is 32-bits long and for the number 5, the resultant string should be "00000000000000000000000000000101"
10. Using arrays, write a program to check whether a given number has repeated digits. Ex: 456754 (has repeated digits) and 3456 (Does not have)
11. Describe the array index out of bound error in context of C array program.
12. Justify the statement: C compiler never check the array index out of bound error.

13. What do you mean by compile time initialization? Give suitable example of Compile time initialization of C Array.
14. Print all possible combinations of r elements in a given array of size n. Given an array of size n, generate and print all possible combinations of r elements in array. For example, if input array is {1, 2, 3, 4} and r is 2, then output should be {1, 2}, {1, 3}, {1, 4}, {2, 3}, {2, 4} and {3, 4}.
15. Given an array, find any two elements of the given array whose difference is 0. a = {12,33,44,66,12,9}
16. Given an array, find all the elements of the array whose sum is equal to 100. a = {23,55,66,77,50, 40, 10}
17. Program to find the addition of pair of elements in a given array input: 2 3 4 5 6 7 output: 5 9 13 input: 2 3 4 5 6 output: 5 9 6

1. What are the limitations of using getchar and scanf functions for reading strings.

2. Compare the working of the following functions:
a)strcpy and strncpy
b)strcat and strncat
c)strcmp and strncmp

3. Why does strcmp return a number that's less than, equal to ,greater than zero ?Also does the exact return value have any significance?

4. What will be the value of the string str after the following statements have been executed.

```
#include<stdio.h>
int main()
{
char str[30];
strcpy(str,"tire-bouchon");
strcpy(&str[4],"d-or-wi");
strcat(str,"red?");
printf("%s",str);
}
```

5. Write a program which will read a string and rewrite it in the alphabetic order. For example the word STRING should be written as GINRST.

6. Write a program , which reads your name from the keyboard and outputs a list of ASCII codes ,which represent your name.

7. Fill in the blanks
a) We can use conversion specification _____ in scanf to read a line of text.
b) The _____ function is used to determine the length of a string.
c)The _____ string manipulation function determines if a character is contained in a string.

8. What is the output of C program with strings?

```
int main()
{
char str1[]="JOHN";
char str2[20];
str2= str1;
printf("%s",str2);
return 0;
}
```

9. What will be the value of the string s1 after the following statements have been executed.

```
#include<stdio.h>
int main()
{
char s1[30],s2[30];
strcpy(s1,"computer");
strcpy(s2,"science");
if(strcmp(s1,s2)<0)
strcat(s1,s2);
else
strcat(s2,s1);
s1[strlen(s1)-6]='\0';
printf("%s",s1);
}
```

10. What does the following program print?

```
#include<stdio.h>
int main()
{
char s[]="Hsjodi",*p;
for(p=s;*p;p++)
```

```
--*p;
puts(s);
}
```

1) Which gdb command interrupts the program whenever the value of a variable is modified and prints the old and new values of the variable

2) If we want to print the value of a variable in hexadecimal, we have to use "print" command with the option ___ in GDB.

3) List the main uses of GDB.

4) We can list all the breakpoints in gdb by the command_____

5) Which one of the following is not true about GDB?
   a) quit command is used to exit the GDB
   b) kill command is used to stop execution in GDB
   c) if the execution is stopped by kill command then it can not be started again
   d) none of the mentioned

6) State true or false:
   While debugging with GDB variables can be printed & modified

7) What are the main parameters that affects the execution of a program in GDB?

8) The specific break point can be deleted by _____ command in GDB.

9) State the difference between step and next command in gdb?

10) State the difference between clear and delete command in gdb?

11) Mention the different ways of invoking GDB.

12) What is the use of gdb - -silent?

13) How to change the listsize to 20 in gdb?