

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Backlog), November 2018
B. Tech in Computer Science and Engineering, Semester: I

Roll No.....

IBM101 : Software Foundation Course with C
Programming

Time: 3 hours Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1A	Objective type multiple choice questions (10 questions @ 1 mark)	10
i.	What will be the output of the following C code? <pre>#include <stdio.h> int main(){ float f1 = 0.1; if (f1 == 0.1) printf("equal\n"); else printf("not equal\n"); }</pre> a) equal b) not equal c) output depends on the compiler d) none of the mentioned	
ii.	What will be the output of the following C code? <pre>#include <stdio.h> void main(){ int x = 4, y, z; y = --x; z = x--; printf("%d%d%d", x, y, z); }</pre> a) 3 2 3 b) 2 3 3 c) 3 2 2 d) 2 3 4	
iii.	What will be the correct syntax for running two variable for loop simultaneously? a) for (i = 0; i < n; i++) for (j = 0; j < n; j += 5) b) for (i = 0, j = 0; i < n, j < n; i++, j += 5) c) for (i = 0; i < n; i++){ for (j = 0; j < n; j += 5){} d) none of the mentioned	

iv.	What will be the output of the following C code? <pre>#include <stdio.h> void main() { int i = 2; do { printf("Hi"); } while (i < 2) }</pre> a) Compile time error b) Hi Hi c) Hi d) Varies	
v.	Which of the following does not initialize <i>ptr</i> to null (assuming variable declaration of <i>a</i> as <code>int a=0;</code>)? a) <code>int *ptr = &a;</code> b) <code>int *ptr = &a - &a;</code> c) <code>int *ptr = a - a;</code> d) All of the mentioned	
vi.	Which of the following is a correct format for declaration of function? a) <code>return-type function-name(argument type);</code> b) <code>return-type function-name(argument type){}</code> c) <code>return-type (argument type)function-name;</code> d) all of the mentioned	
vii.	How many bytes in memory taken by the following C structure? <pre>#include <stdio.h> struct test { int k; char c; };</pre> a) Multiple of integer size b) integer size+character size c) Depends on the platform d) Multiple of word size	
viii.	Which option is not possible for the following function call? <code>func(&s.a);</code> //where <i>s</i> is a variable of type <i>struct</i> and <i>a</i> is the member of the struct. a) Compiler can access entire structure from the function b) Individual member's address can be displayed in structure c) Individual member can be passed by reference in a function d) None of the mentioned	
ix.	What will be the output of the following C code? <pre>#include <stdio.h> struct student { char *c; }; void main() { struct student s[2]; printf("%d", sizeof(s)); }</pre> a) 2 b) 4 c) 16 d) 8	

- x. What will be the output of the following C code?

```
#include <stdio.h>
void main() {
    int k = 5;
    int *p = &k;
    int **m = &p;
    **m = 6;
    printf("%d\n", k);
}
```

- a) 5 b) Run time error c) 6 d) Junk

Q.2

- A. Why are the variables in the following list invalid:

02

- i) value\$sum ii) exit flag
iii) 3lotsofmoney iv) char

- B. Write C statement to do the following:

08

- i. Assign the value of the variable number1 to the variable total
- ii. Assign the sum of the two variables loop_count and petrol_cost to the variable sum
- iii. Divide the variable total by the value 10 and leave the result in the variable discount
- iv. Assign the character W to the char variable letter
- v. Assign the result of dividing the integer variable sum by 3 into the float variable costing. Use type casting to ensure that the quotient is a float variable. (e.g. 4/3=1.333...)
- vi. Declare a variable called arctan which will hold scientific notation values (+e)
- vii. Define a constant called TRUE which has a value of 1
- viii. Define a constant called GST with a value of .125

- Q.3A Write down the output of the following C program. If a given output is unpredictable, write '#' in the corresponding place.

05

```
#include <stdio.h>
#include <stdlib.h>
int main(){
    int a[3][3]={0,1},{2,3},{5,6}},**b,i,j;
    b=(int **)calloc(3,sizeof(int *));
    for(i=0;i<3;i++) {
        b[i]=(int *)calloc(3,sizeof(int));
    }
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            b[i][j]=(i+1)*(j+1);
        }
    }
    printf("%d %d %d %d\n",*(a+4),**a+4,*(b+4),**b+4);
    printf("%d %d %d %d\n",*(a[2]-2),**(a+2),*(b[2]-2),**(b+2));
    return 0;
}
```

Q.3B	Write a C function which accepts a string as argument and returns the last alphabet of the string. If the string has no alphabet, then the function returns '#'. For example, if the string argument is "How are you?", the function returns 'u'. (Do not use <i>strlen</i> function)	05
Q.4A	Write a C program that accepts a positive integer from the keyboard. If the input is invalid, it stops with appropriate message. For a valid input, it determines the first and last digits of the number. Further, it checks whether the first digit or the last digit is multiple of the other with appropriate message.	05
Q.4B	Define a structure that describes a complex number. Write a C function that accepts a complex number as its argument and returns the magnitude of the complex number.	05
Q.5A	Rewrite the following code without <i>while</i> construct: <pre>int n,s; n=1; s=0; while(n != 49){ n++; s +=n; n +=2; }</pre>	05
Q.5B	Rewrite the following code using <i>while</i> construct. What is the output of the code? <pre>int i,j=1; for(i=1,j++;i+j<12;i+=j++){ i--; j *=2; } printf("%d %d\n",i,j);</pre>	05
Q.6	Write a C function that accepts an integer array and an integer (that denotes the actual size of the array) as its arguments and reverses the elements of the integer array. For example, if the original array was {3,1,4,2,0,5}, then it would become {5,0,2,4,1,3} upon completion of the function. You must not use any other array inside the function.	10
OR		
Q.6	Write a program which reads a single letter of alphabet. If the alphabet is in lowercase between <i>a</i> and <i>g</i> , the program prints out the alphabet in uppercase form. If it is anything else, the program should print out X.	10
Q.7	Write a program that accepts the monthly salary as an integer (maximum 5 digits) and produces the output as shown in the example. Example: For input 4012 the output is The monthly salary is Rupees 4 thousand and 12 only. For input 24102 the output is The monthly salary is Rupees 24 thousand 1 hundred and 2 only.	10

OR		
Q.7	Write a C program which reads a date as three integers representing day, month and year. It then prints the date of the next day. (Assume that the year is not a leap year).	10
Q.8	Write a program which takes three integers input representing a time (in 24 hour clock convention) as hours, minutes, and seconds. While reading, the program checks the acceptability of the input numbers. It then prints out the time (in 24 hour clock convention) obtained by adding 15 seconds to the input time. Example: For typical input 14 20 46 the typical output is 14:20:46+00:00:15=14:21:01	10
Q.9A	Write a C program that accepts a positive integer (from the keyboard). If the input is invalid, it stops after printing the message Invalid input. For a valid input, it then computes and prints out the sum $1 \cdot n + 2 \cdot (n - 1) + 3 \cdot (n - 2) + \dots + (n - 1) \cdot 2 + n \cdot 1$	10
Q.9B	Write a C program that reads two real numbers (from keyboard) representing the x and y coordinates of a point in the Cartesian plane. It then checks whether the point lies inside, outside or on a circle of radius 5 with centre at the origin. Finally, it prints appropriate message too. (Example: Typical input: 2.5 3.0 Typical output: The point lies inside the circle Typical input: 1.9 4.8 Typical output: The point lies outside the circle Typical input: 3.0 4.0 Typical output: The point lies on the circle)	10
OR		
Q.9	Construct a structure variable <i>pt</i> which represents a point in <i>xy</i> -plane. A circle can be defined by its center and radius. Using <i>pt</i> , construct a structure variable <i>cir</i> which represents a circle in the <i>xy</i> -plane. Write a C function which accepts addresses of two structure variables representing circle as arguments and returns the midpoint of the line segment joining their centers.	10