

Registration No. :

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Total number of printed pages – 4

B. Tech
BE 2105

First Semester Examination – 2012-13

PROGRAMMING IN C

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any **five** from the rest.

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10

(a) What is the expected output for the following program and why ?

```
enum {false,true};
int main()
{
    int i=1;
    do
    {
        printf("%d\n",i);
        i++;
        if(i < 15)
            continue;
    }while(false);
    return 0;
}
```

(b) What is the output of the following program ? Explain with reason.

```
#include <stdio.h>
int main()
{
    int i = 6;
    if(((++i < 7) && (i++/6)) || (++i <= 9)) ;
    printf("%d\n",i);
    return 0;
}
```

P.T.O.

- (c) Find the output of the following program when compiled in Turbo C.

```
void main()
{
int x=30, *y, *z;
y = &x;
/* Assume address of x is 100 */
z = y;
*y++ = *z++;
x++;
printf("x = %d, y = %d, z = %d\n", x, y, z);
}
```

- (d) Find the output of the following program in C while compiled in Turbo C with reason.

```
void main ()
{
int i = 0 , a[3] ;
a[i] = i++ * ++i;
printf ("%d",a[i]) ;
}
```

- (e) What will be the output of the program in 16 bit platform (Turbo C under DOS) ? Give reason.

```
#include<stdio.h>
int main()
{
    struct value
    {
        int bit1:1;
        int bit3:4;
        int bit4:4;
    }bit;
    printf("%d\n", sizeof(bit));
    return 0;
}
```

- (f) What will be output of following program ? Explain with reason.

```
#include<stdio.h>
int main()
{
char arr[10];
arr = "world";
printf("%s",arr);
return 0;
}
```

- (g) What is a generic pointer ? Explain with an example.
 (h) What will be the output of the program (sample.c) given below if it is executed from the command line (turbo c under DOS) ? Explain the output.

```
cmd> sample Good Morning
/* sample.c */
#include<stdio.h>
int main(int argc, char *argv[])
{
printf("%d %s", argc, argv[1]);
return 0;
}
```

- (i) What will be the output of the program (16-bit platform) ? Give reason.

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
int *p;
p = (int *)malloc(20);
printf("%d\n", sizeof(p));
free(p);
return 0;
}
```

- (j) What would be the output of the following program ? Discuss with justification.

```
#include <stdio.h>
static int i=20;
int main(){
i=5;
for(i=0; i<5; i++){
static int a=10;
printf("%d",++a);
}
return 0;
}
```

2. (a) Write three independent programs to print first 100 positive odd integer numbers except those completely divisible by 5 using
 (i) *while* loop
 (ii) *do ... while* loop and
 (iii) *for* loop used in C. 5
- (b) Develop the flowchart and write the program to find the roots of a general quadratic equation. 5

3. (a) Write a program to award grades in lieu of marks in the following ranges using **switch...case** branching structure 5
- | | | | |
|---------------|---|---------|--|
| 90% and above | : | O grade | |
| 80% to 89% | : | E grade | |
| 70% to 79% | : | A grade | |
| 60% to 69% | : | B grade | |
| 50% to 59% | : | C grade | |
| 37% to 49% | : | D grade | |
| Less than 37% | : | F grade | |
- (b) Write a program to check whether a given sentence is a palindrome sentence or not. Do not use any standard string handling library functions. 5
4. (a) Write a function subprogram to return factorials of two positive integers simultaneously called by a main function. 5
- (b) Write a complete program to check a given positive integer is a prime number or not, by writing a recursive function. 5
5. (a) Differentiate between the following : 2.5 + 2.5
- Structure vs Union
 - Arrays vs Pointer
- (b) Design a structure for storing the personal information of your friends by considering the fields as name, roll number, mobile number, hostel, room number, semester and branch. Take field length and type of your choice. Write a complete program only to read this structure for 30 friends of your class and print those records. 5
6. (a) Create a structure to store a complex number and write three functions (for addition, multiplication and division) that handle this new structure. 5
- (b) Write a program that reads the content of a file and prints it on the screen. 5
7. (a) Ugly numbers are numbers whose only prime factors are 2, 3 or 5. The sequence 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 15, ... shows the first 11 ugly numbers. By convention, 1 is included. Write an algorithm to check whether a given unsigned number is a multiple of 3, without using division and modulo operators. Convert the algorithm into equivalent program. 5
- (b) Explain the use of command line arguments in C programming with a suitable example. 5
8. (a) Write a function using pointers to add two matrices and to return the resultant matrix to the calling function. 5
- (b) Explain with simple examples the use of following in C : 2.5 + 2.5
- Storage classes
 - Dynamic Memory Management functions.