

(Please write your Exam Roll No.)

Exam Roll No. 037.....383044

END TERM EXAMINATION

FIRST SEMESTER [MCA] NOVEMBER-DECEMBER 2017

Paper Code: MCA-103

Subject: Programming in C

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions including Q.no.1 which is compulsory.
Select one question from each Unit.

- Q1 Answer **any ten** the following briefly: (2.5x10=25)
- (a) What are the restrictions on switch statement in C?
 - (b) How is the lifetime of variables created on stack different from those created on heap?
 - (c) Give an array int **A[5][15]**, give the offset address of **A[i][j]** with respect to base address of A.
 - (d) Why can't we input bit field of structures using **scanf** function?
 - (e) How can assertions in a program be disabled?
 - (f) What is the problem with the statement **#define COUNT 10**;
 - (g) Explain the role of compiler and linker in conversion of C source code to executable code.
 - (h) When and why would you prefer using statically created arrays over dynamically created arrays?
 - (i) Why is the function **gets** considered unsafe?
 - (j) How would you ensure that the next read operation in a file takes place from a location that is 10 bytes ahead of the current position?
 - (k) What is the difference between **stat** and **access**?

Unit-I

- Q2 (a) How do void pointers and function pointers help in generic programming in C? (6)
(b) Give a recursive definition for x^y where y could be a positive or negative integer. (6.5)
- Q3 (a) Explain, with help of an example, the advantage of bit operators for strong multiple Boolean variables. (6)
(b) Write a C function to generate the following pattern for variable number of rows: (6.5)

```
1  2  3  4
8  7  6  5
9 10 11 12
16 15 14 13
```

Unit-II

- Q4 (a) Explain the concept of leakage of memory with help of a diagram showing contents of stack and heap. (6.5)
(b) Use pointer arithmetic to input an array and compute sum of value stored at even index locations only. (6)
- Q5 (a) Explain the difference between storage of structures and unions with help of a diagram. (6.5)
(b) Write functions to accept and displays arrays of **Product** structure. The arrays must be passed as parameters and not accessible globally. (6)

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Unit-III

- Q6 (a) Discuss the need and usage of #define, #if and #under with help of a proper example. (6)
 (b) Given a file containing result of students as {Roll, Semester, Marks [5]}. Write function that uses binary read, to generate mark sheet of a student (given her roll number) in a particular semester. (6.5)
- Q7 (a) Compare the advantages and disadvantages of formatted I/O and Block I/O. (6)
 (b) Write a C function to simulate throwing of a dice. Your function should generate a random integer in the range 1-6. Use this function to make a simple game where a user is allowed to throw a dice N (variable) number of time and the person is a winner if the sum of generated numbers, in a maximum of N throws becomes exactly equal to M (another integer variable). Ensure $M > N$. (6.5)

Unit-IV

- Q8 (a) Explain the difference between Processes and Threads, with suitable examples and justification of when would you prefer using a process or a thread. (6.5)
 (b) Write a program that uses system calls to read an inode of a file whose name is passed as command line parameter. The program should display the size of the file and the rights the owner has on the file. (6)
- Q9 (a) Discuss the directory structure of Linux. (6.5)
 (b) Explain thread creation in Linux, with help of an example. (6.5)

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