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MCA
PCS 1001

First Semester Examination – 2007

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) A computer system has eight (8) bit addressing. What, in binary, is its range of addresses ? What is the total number of memory cells it can address ?

P.T.O.

✓(b) What is flow chart ? List out symbols used in writing flowchart. 2

✓(c) What's the difference between these two declarations ?

```
struct x1 { ... };
```

```
typedef struct { ... } x2;
```

✓(d) What is meant by the "equivalence of pointers and arrays" in C ? 1

✓(e) What does extern mean in a function declaration ?

✓(f) What's the difference between using a typedef or a #define for a user-defined type ?

✓(g) Convert the following 4-bit binary numbers to decimal (assume unsigned) : 0000, 1111, 0001, 0101, 0111, 1000, 1001 ? 2

✓(h) Convert the following binary numbers with fractional parts to decimal : (i) 11.11, (ii) 101.111 ? 2

✓(i) What does it mean for a function parameter to be const ? What do the two const's mean in the following statement:

```
int f(const * const p)
```

✓(j) Write the flow chart for computing the biggest of 3 given numbers ? 1

2. ✓(a) List out fundamental data types in C. Explain the use of bitwise operators in C with examples. 3 5

✓(b) Write a program to find the number and sum of all integers from 100 to 200 and divisible by 7. 4 5

3. (a) Which library file is included in each C program ? Write the #include statement for that file and other files you have used in your program. Explain why each of those files were included. 5

(b) Explain the structure of hard disc. Compare floppy disc and hard disc. 5

✓4. (a) Depicts a block diagram of Central Processing Unit. Briefly describe :

(i) the purpose of an ALU 3

(ii) the role of the MAR and MBR in CPU-memory interaction. 5

✓(b) Write a C program to convert a given decimal numbers into its binary equivalent. 5

5. (a) How are structure passing and returning implemented ? Is it possible to pass constant values to functions, which accept structure arguments ? 5

(b) You are given sufficient number of 5 paise, 10 paise, 20 paise, 25 paise and 50 paise denominations. Given a value of R rupees and P paise, write a C program to determine the minimum number of

coins to get the required value. Use any looping construct to implement the program. 5

6. ✓(a) Write a program using switch statement to grade the students marks as $A \geq 80$, $B = 70 - 79$, $C = 60 - 69$, $D = 50 - 59$ and the rest below 50 as E grade. 5

✓(b) Let a and b are two integers arrays each with n elements. Write a program to find the array c such that 3

$$c[i] = a[i] + b[n-1-i]$$

7. ✓(a) What is an array ? How are they declared in 'C' ? What are the rules to be followed while using arrays ? 5

(b) Write a program to evaluate the following series. $f(x) = x - x^3/3! + x^5/5! - x^7/7! \dots$ upto given numbers of terms. 5

0, - 27/7!

8. (a) What is the difference between an enumeration and a set of preprocessor #defines ? 2.5

✓(b) What is the difference between arrays and pointers ? 2 2.5

✓(c) What is the difference between const char*p, char const *p, and char * const p ? 2.5

(d) How to allocate a multidimensional array dynamically ? 2 2.5

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