

Code: AC05 / AT05

Subject: PROGRAMMING & PROBLEM
SOLVING THROUGH 'C'

Time: 3 Hours

DECEMBER 2008

Max. Marks: 100

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or best alternative in the following: (2x10)

a. The variables declared out of the main() function are

- (A) External variable (B) Register variable
(C) Auto variable (D) Static variable

b. The value of the given expression is

$$x + y * x - z \quad \text{where } x=5, y=6, \text{ and } z=8$$

- (A) 47 (B) 33
(C) -33 (D) 27

c. Which is invalid identifier name?

- (A) my_name (B) Part_123
(C) part123 (D) 123part

d. The output of given code is

```
for (i = 1; i <= 10; i++);
printf("%d", i);
```

- (A) 1 2 3 4 5 6 7 8 9 10 (B) 10
(C) infinite loop (D) None of the above.

e. What is the output

```
a = 5;
a << 1;
```

0	0	0
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- (A) (B)
(C)

 (D)

f. The value of given code is

floor(-1.02);

- (A) 2.0
(B) -1.0
(C) -2.0
(D) 1.0

g. What is the output of following program:-

```
main()
{
    int x, *p, **q;
    x = 10;
    p = &x;
    q = &p;
    printf("Value of x = %d", **q);
}
```

- (A) Value of x = 10
(B) Value of x = 1203 (address of q)
(C) Value of x = 2034 (address of p)
(D) None of the above

h. The name of the standard errors file is

- (A) stderr
(B) stdr
(C) stderr
(D) none of the above

i. Minimum number of temporary variables needed to swap the contents of two variables is/are

- (A) 1
(B) 2
(C) 3
(D) 0

j. Name the datastructure which has two pointer elements: One pointing to the next element and another pointer pointing to the previous element with which one can traverse the list in either direction.

- (A) Stack
(B) Queue
(C) Linked list
(D) Double linked list

**Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.**

Q.2 a. Discuss general problem solving strategies. **(8)**

b. What is the O-notation? Discuss what the terms "worst case" and "average case" behaviour of algorithm mean? **(8)**

- Q.3** a. Explain the various criteria for designing efficient algorithm. (7)
- b. Design an algorithm to find the maximum number in an array of numbers. (9)
- Q.4** a. Compare switch statement with if-else statement? Outline the situations in which each one is preferred. (7)
- b. Write a C program to sum the digits of a number using a while loop. (9)
- Q.5** a. What is meant by array initialization and what types of storage class be used for array initialization. (7)
- b. Write a C program to find the given string as palindrome or not. (9)
- Q.6** a. What is meant by function arguments, function call and return values. (6)
- b. Write a C program to perform addition, subtraction, multiplication and division of two complex numbers using a structure. (10)
- Q.7** a. Distinguish between the array of pointers and pointer to the array. (7)
- b. Write a C program to construct a linear linked list of n numbers and to display the list in Last In First Out (LIFO) method. (9)
- Q.8** a. Explain the following functions:
- | | |
|---------------|---------------|
| (i) feof() | (ii) ftell() |
| (iii) fseek() | (iv) ferror() |
| (v) malloc() | (10) |
- b. Why is a linked list called dynamic data structure? What are the advantages of using linked list over arrays? (6)
- Q.9** a. What is a preprocessor directive? Write a macro to compute the cube of a number. (5)
- b. Distinguish between #ifdef and #if directives. (5)
- c. Explain Testing and debugging process briefly. (6)