Code: AC-05 / AT-05
Subject: PROGRAMMING \& PROBLEM
JUNE 2007

Time: 3 Hours

SOLVING THROUGH ' ${ }^{\text {C }}$ '<br>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:
a. Which amongst the following expression uses bitwise operator?
(A) $\mathrm{a}^{++}$
(B) $!\mathrm{a}>5$
(C) $\mathrm{a} \mid \mathrm{b}$
(D) $\mathrm{a}!=\mathrm{b}$
b. The output of the following program is

```
    main( )
    { float y;
        y=198.7361;
        printf('%7.2f', y);
}
```

(A)

| 1 | 9 | 8 | . | 7 | 3 | 6 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |

(B)

| 1 | 9 | 8 | . | 7 | 3 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |

(C)

|  | 1 | 9 | 8 | . | 7 | 4 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |

(D)

| 1 | 9 | 8 | . | 7 | 4 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |

c. Which is not dynamic memory allocation function?
(A) malloc
(B) free
(C) alloc
(D) calloc
d. Which header file is used for screen handling function:-
(A) IO.H
(B) STDLIB.H
(C) CONIO.H
(D) STDIO.H
e. Choose the directive that is used to remove previously defined definition of the macro name that follows it -
(A) \# remdef
(B) \# pragma
(C) \# undef
(D) \# define
f. The output of the following is

$$
\begin{aligned}
& \mathrm{x}=\mathrm{a} \mathrm{a} \text { '; } \\
& \text { printf("\%d", x); }
\end{aligned}
$$

(A) ' a '
(B) a
(C) 97
(D) None of the above
g. Consider the following statement

> int j, k, p;
float $\mathrm{q}, \mathrm{r}, \mathrm{a}$;
$\mathrm{a}=\mathrm{j} / \mathrm{k}$;
$\mathrm{p}=\mathrm{q} / \mathrm{r}$;
If $q=7.2, r=20, j=3, k=2$
The value of a and $p$ is
(A) $\mathrm{a}=1.5, \mathrm{p}=3.6$
(B) $\mathrm{a}=2, \mathrm{p}=3$
(C) $\mathrm{a}=1.5, \mathrm{p}=4$
(D) $\mathrm{a}=1, \mathrm{p}=3$
h. Choose the function that returns remainder of $\mathrm{x} / \mathrm{y}$ -
(A) remainder()
(B) $\bmod ()$
(C) modulus()
(D) $\operatorname{rem}()$
i. What is the output of following program:-

$$
\begin{array}{ll}
\text { int } q, * p, n ; & \\
q=176 ; & \text { If the address of } q \text { is } 2801 \\
\mathrm{p}=\& q ; & \text { and } p \text { is } 2600 \\
\mathrm{n}=* \mathrm{p} ; & \\
\text { printf( }(\% \mathrm{~m} ", \mathrm{n}) ; &
\end{array}
$$

(A) 2801
(B) 176
(D) 2600
(D) None of the above
j. Consider the following statements-

$$
\begin{aligned}
& x=5 \\
& y=x>3 ? 10: 20
\end{aligned}
$$

The value of $y$ is
(A) 10
(B) 20
(C) 5
(D) 3
Q. 2 a. Explain various steps for analysing an algorithm.
b. What are Translators? Explain its various types.
c. Design an algorithm to generate all the primes in the first $n$ positive integers.
Q. 3 a. Explain various classes of datatypes of C
b. What are escape sequences characters? List any six of them.
c. Write a C program to calculate the average of a set of $N$ numbers.
Q. 4 a. Compare the use of switch statement with the use of nested if-else statement.
b. What do you mean by underflow and overflow of data.
c. Write a C program to multiply two matrices (maximum size of the two matrices is $20 \times 20$ each).
Q. 5 a. Explain, in brief the purpose of the following string handling functions:
(i) strcat
(ii) strcmp
(iii) strcpy
Use suitable examples
b. Write a C program to read a line of text containing a series of words from the terminal. (7)
c. Explain the need for user-defined functions.
Q. 6 a. Differentiate between structure and union, use suitable examples.
b. What are the various parameter passing mechanisms? Explain them briefly.
c. Define a structure in C , which stores subject-wise marks of a student. Using a student array, write a C program to calculate the total marks in each subject for all the students.
(8)
Q. 7 a. Distinguish between break and goto statement.
b. Explain the following directives:
\#elif \#pragma \#error
c. Using recursion, write a C program to reverse a given number.
Q. 8 a. Write a C function to delete a given item from a single linked list. Check for duplicate elements.
b. Consider the following:
$P_{1}$ is an integer pointer
$P_{2}$ is a long integer pointer
$P_{3}$ is a character type pointer
The initial value of $\mathrm{P}_{1}$ is $2800, \mathrm{P}_{2}$ is 1411 and $\mathrm{P}_{3}$ is 1201 .
What is the new value of $P_{1}$ after $P_{1}=P_{1}+1, P_{2}$ after $P_{2}=P_{2}+1$ and $\mathrm{P}_{3}$ after $\mathrm{P}_{3}=\mathrm{P}_{3}+1$;
c. Differentiate between White Box and Black Box Testing.
Q. 9 a. Write a C program using pointers to compute the sum of all elements stored in an array.
b. Write a C program to create a file contains a series of integer numbers and then reads all numbers of this file and write all odd numbers to other file called odd and write all even numbers to a file called even. (8)

