



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (NEW)/SEM-2/CS-201/2011  
2011**

**BASIC COMPUTATION AND PRINCIPLES OF  
COMPUTER PROGRAMMING**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :  $10 \times 1 = 10$

- i) The purpose of mode r+ is to
  - a) open for only reading
  - b) open for only writing
  - c) open for both reading and writing
  - d) none of these.
- ii) Pointer is
  - a) a variable containing the address of a variable
  - b) a value
  - c) a memory location
  - d) none of these.



- iii) A function may contain
- a) one return statement
  - b) two return statements
  - c) more than two return statements
  - d) none of these.
- iv) Which of the following is not used as secondary storage ?
- a) Semiconductor memory
  - b) Magnetic discs
  - c) Magnetic drums
  - d) Magnetic tapes.
- v) The ALU of computer normally contains a number of high speed storage elements called
- a) semiconductor memory
  - b) registers
  - c) hard disc
  - d) magnetic disc.



- vi) The register which contains the instructions that are to be executed is known as
- a) Index register
  - b) Instruction register
  - c) Memory address register
  - d) Memory data register.
- vii) A 32 bit microprocessor has the word length equal to
- a) 2 bytes
  - b) 4 bytes
  - c) 1 byte
  - d) 8 bytes.
- viii) The union holds
- a) one object at a time
  - b) multiple objects
  - c) both (a) and (b)
  - d) none of these.
- ix) The minimum number of auxiliary variables required in a swap routine in C language to interchange two variables is
- a) 0
  - b) 1
  - c) 2
  - d) indeterminate.
- x) Language C uses
- a) call by value
  - b) call by reference
  - c) call by name
  - d) none of these.



**GROUP – B**  
**( Short Answer Type Questions )**

Answer any *three* of the following.

$$3 \times 5 = 15$$

2. If K bytes are required to store a number in hexadecimal number system, find how many bytes will be required to store the number in binary number system ?
3. If  $C_1$  and  $C_2$  are two computer languages, what do you mean by the statement. “The level of language  $C_1$  is higher than that of  $C_2$ .” Is it possible to convert the language of a particular level into another language of other level ? If so, how ? If no, why ?  
 $3 + 2$
4. Write a program in C to compute the average of a few input quantities with minimum use of storage variables, where the number of inputs is not known beforehand.
5.
  - a) What is recursion ?
  - b) What do you mean by pointer arithmetic ? Explain with example.  
 $2 + 3$
6.
  - a) Why do we use functions in programming ?
  - b) Write a function prototype which accepts an integer, a float pointer, a string and a structure pointer as parameters.
  - c) How do you access a structure variable through a structure pointer ? Explain with example.  $1\frac{1}{2} + 1\frac{1}{2} + 2$



**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.

3 × 15 = 45

7. a) Explain two input Exclusive NOR gate using truth table.  $2\frac{1}{2}$
- b) Why is NOR gate called universal gate ?  $2\frac{1}{2}$
- c) Simplify : 4
- $$(A + \bar{B}) \cdot (A \cdot C) + (A \cdot \bar{B} + \bar{A} \cdot C) \cdot (\bar{A} + D)$$
- d) Convert the following :  $3 \times 2$
- i)  $(2AD)_{16} = ( )_2$
- ii)  $(11100111101)_2 = ( )_{16}$
- iii)  $(25 \cdot 125)_{10} = ( )_2$
8. a) Draw a block diagram of a computer and briefly explain its various components. Is it possible to realize a digital computer without a primary memory ? Justify. 5 + 3
- b) What is the significance of different levels of computer language ? 3
- c) Distinguish between compiler and interpreter. 4



9. a) Allocate a two-dimensional array dynamically using pointers in C language. 5

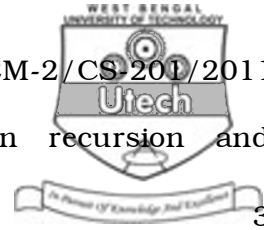
b) What is the utility of break statement in loop ? Give an example. How is break statement different from an exit ( ) statement ? 2 + 2

c) Write a program in C to find all the prime numbers in the range 10 to 100. 6

10. a) Write down the difference between malloc ( ) and calloc ( ). 2

b) What are auto, extern and static variables ? Explain their uses with suitable example. 6

c) Write a program to read a file and display its contents along with line number before each line. 7



11. a) What are the differences between recursion and iterations ? 3

b) Write a C program to print the following pattern  
( till  $n$  rows, where  $n$  is taken as input )

```
1
2 2
3 3 3
4 4 4 4
```

5

c) Create a structure to specify data on students give below :

Roll Number, Name, Department, Course, and Year of admission.

Assume that there are not more than 450 students in collage.

Write a program to print names of all students who joined in a particular year. 7

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