

6/12/18

Indian Institute of Engineering Science and Technology, Shibpur
B.Tech. 1st Semester (AE/CE/ME/MET/MIN) Examinations, 2018
Introduction To Computing (CS - 1201)

Full Marks: 35

Time: 2 Hours

*Answer question no. 1 and any three from the rest.
For the programming problems use C language.*

1. *Answer any seven questions.*

- (a) Identify the memory with highest operating speed among the following and write down its function?
RAM, Hard Disk, CPU Register
- (b) What is language translator? Give example of two language translators.
- (c) Point out any two functions of operating system.
- (d) Prove the correctness of the following logic equality: $x'y + xz + yz = x'y + xz$ where x , y , and z are three Boolean variables.
- (e) Draw the logic circuit that emulates XOR gate using NOR gates only.
- (f) Explain the principle of duality in Boolean Algebra with example.
- (g) Find out the logic expression for the borrow and difference of half-subtractor.
- (h) Convert the number $(A19)_{16}$ to octal without any intermediate conversion into decimal.
- (i) What is the basic difference between structure and union?
- (j) "Processing of macro is faster than that of function call" - Justify the statement.

[$(2 \times 7) = 14$]

2. (a) Write a program to find the real roots of the quadratic equation $ax^2 + bx + c = 0$ where the coefficients a , b , and c are to be taken as inputs.
- (b) Explain the operation of ternary operator using an example.

[$5 + 2 = 7$]

3. (a) Write a program to find the odd factors of an input number and store them in an array.
- (b) How do you dynamically allocate space for 5 integers?

[$5 + 2 = 7$]

4. (a) Write a recursive function `long int rpow(int, int)` that will find the value of x raised to the power of y ; where x and y are two positive input-integers. Also show a calling instance of this function from `main()`.
- (b) Write an user-defined function that can find the length of a string.

[$5 + 2 = 7$]

5. (a) Write a program to copy one existing file (source file, say `file1.txt`) into another named file (destination file, say `file2.txt`). In this case take file names as input through command line arguments as follows:

\$./a.out file1.txt file2.txt

Here the contents of `file1.txt` is to be copied to `file2.txt` and \$ indicates the command prompt.

- (b) Explain the statement `FILE * fp = fopen("INPUT", "w");`

[$5 + 2 = 7$]

6. (a) Define storage class.
- (b) Distinguish between the followings:
- Actual and formal arguments
 - Automatic and Static variables
 - Break and Continue statements

[$1 + 6 = 7$]