

Subject: I.T
Time Allowed: 2:30 Hours

Note: Objective part is compulsory. Attempt any three questions from subjective part.

University of Sargodha

M.Sc. 1st Term Examination 2019

Paper: Programming Fundamentals (CMP-2122)

Maximum Marks: 80

Q.1. Write short answers of the following in 2-3 lines each on your answer sheet. (16*2)

- i. Differentiate between assembly languages and high-level languages.
- ii. Define structured programming languages.
- iii. Define algorithms.
- iv. List the sub processes involved in program development.
- v. Discuss at least four data types of C/C++ with examples.
- vi. Discuss input and output commands of C/C++ with examples.
- vii. Discuss at least three selection control structures with examples.
- viii. Differentiate between while and do-while loops.
- ix. What does break statement do? Explain it with an example.
- x. What does continue statement do? Explain it with an example.
- xi. What are the different types of user defined functions available in C/C++?
- xii. Differentiate between one-dimensional and two-dimensional arrays with example.
- xiii. What are pointers in C/C++? Explain it with example.
- xiv. What are records do in C/C++? Provide example.
- xv. How the files can be handled in C/C++? Discuss some file operations.
- xvi. What do you know about testing and debugging?

Subjective Part (3*16)

Q.2. Given a string as displayed in Input below, find the number of alphabetic letters and number of decimal digits in that string as displayed in the output:

Input: 12abc12

Output: Alphabetic_letters = 3, Decimal_digits = 4

Q.3. Given an array of positive integers. All numbers occur even number of times except one number, which occurs odd number of times. Find the number in O(n) time & constant space. For example if input array is arr = {1, 2, 3, 2, 3, 1, 3} then output would be 3.

Q.4. Write a program to print all the LEADERS in the array. An element is leader if it is greater than all the elements to its right side. And the rightmost element is always a leader. For example in the array {16, 17, 4, 3, 5, 2}, leaders are 17, 5 and 2.

Q.5. Given a string, count number of words in it. Following characters separates the words: space (' ') or new line ('\n') or tab ('\t') or a combination of these.

Q.6. Write a Program to find area of a triangle. For example if input would be a = 5, b = 7, c = 8 then output would be area of a triangle as 17.320508. Area of a triangle can simply be evaluated using following formula as $\text{Area} = \sqrt{s*(s-a)*(s-b)*(s-c)}$ where a, b and c are lengths of sides of triangle and $s = \frac{(a+b+c)}{2}$.