UNIVERSITY OF DAR-ES-SA
SCHOOL OF INFORMATICS AND COMMUNICA
COMPUTER SCIENCE UNI
2ND SEMESTER EXAMI

SECTION B

Q 5: In managing a linked list, perform the following:

a. Define a structure named **kituo** which has, as its attribute, **mshahara** of type **float, socfund** of type float as we and a pointer link to hold an address of the next element, call it **link** **(2 marks)**

b. Write a function that takes in the address of the first node and returns the data value of the first node in the linked list (it should first check if the list is not empty. **(4 marks)**

c. If the variable holding the address of the first element is called **top**, define a variable called **current** and use it to move from the beginning of the list to the end, while multiplying the mshahara value by two for each node. **(6 marks)**

Q 6: Write a program that computes the volume of a sphere given its radius in which, you are required to

a. Write a function that takes in the **radius** as a float data type and returns **volume** as a float data as well. This is only if the radius value was positive, otherwise, returns -1. **(5 marks)**

b. Assuming the function was saved in a file called **calculations.c** write the main function that prompts the user for the **radius,** and use the function created above to compute the volume. The main function should later print out the volume of the sphere. *(Volume = $^{4}/_{3}\,\pi\,R^{3}$).* **(7 marks)**

Q 7: A company XYZ decided to increase the salary of its personnel in the manner shown in the table below

Duration (months)	Formula
0 – 11	Increment = Salary X 25%
12 -23	Increment = Salary X 50%
24 – 36	Increment = Salary X 75%
36+	Increment = Salary

a. Create a function that takes in salary of a float data type and the duration of work in months, which is of integer type. After computation it should return the increment. **(8 marks)**

b. Sometimes it happens that they confuse to store salaries in the right columns and so they will need to swap them. Write a function, using pointers, that takes in two **float** numbers and swap them: **(4 marks)**

Q 8: Write a program that accepts two integer numbers of a range, **min** and **max**, and list all the odd numbers between using the following instructions.

a. Since **min** should always be greater than **max**, write a function that returns 1 if **min** is greater than **max** and 0 otherwise **(3 marks)**

b. Write a function that takes in the two numbers and list all the odd numbers between **(3 marks)**

c. Write the main program that prompts the user for the **min** and **max** and use the above two functions to list the odd numbers between them. It should repeat prompting till the **min < max** condition is met. **(6 marks)**

Q 9: a. List the three ways in which pointers can be used in C: **(3 marks)**

b. Write a programme, using arrays, that accepts marks of a test from a number of students marks (the number o students to be provided by the user) and deduct 7 from each. If the resulting mark for an individual is less than 40 it should set the marks to be 40. **(9 marks)**