UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FIRST SEMESTER EXAMINATIONS, NOV/DEC. 2018

COURSE NO: EL 163
COURSE NAME: Introduction to programming with C++ (Practicals)
CLASS: EL I **TIME**:2 HOURS

Name**:** _____Index Number: _____

Answer question 1 and any one of the two other questions.

Question 1 (20 marks)

(Computer-Assisted Instruction) The use of computers in education is referred to as computer-assisted instruction (CAI). Write a program that will help an elementary school student learn basic multiplication arithmetic operations. Use the rand function to produce two positive integers. The program should allow the user to enter a difficulty level. At a difficulty level of 1, the program should use only single-digit integers in the problems; at a difficulty level of 2, the program should use only two-digit integers in the problems. Create a function for multiplication and pass the random integers as the function parameters based on the selected difficulty level. The program should then prompt the user with a random question by calling arithmetic functions. The student then inputs the answer. Next, the program checks the student's answer. If it's correct, display possible messages such as ***"Excellent!"*** and ask another arithmetic question. If the answer is wrong, display the message "No. Please try again." and let the student try the same question repeatedly until the student finally gets it right. The function should be called once when the application begins execution and each time the user answers the question correctly.

Question 2 (10marks)

A certain grade of steel is graded according to the following conditions:
(1) Hardness must be greater than 50
(2) Carbon content must be less than 0.7
(3) Tensile strength must be greater than 5600

The grades are as follows:
Grade is 10 if all three conditions are met
Grade is 9 if conditions (i) and (ii) are met
Grade is 8 if conditions (ii) and (iii) are met
Grade is 7 if conditions (i) and (iii) are met
Grade is 6 if one condition is met
Grade is 5 if none of the conditions are met
Write a C++ program which will require the user to give values of hardness, carbon content and tensile strength of the steel under consideration and output the grade of the steel.

Question 3 (10 marks)

A parking garage charges a $2.00 minimum fee to park for up to three hours. The garage charges an additional $0.50 per hour for each hour or part thereof in excess of three hours. The maximum charge for any given 24-hour period is $10.00. Assume that no car parks for longer than 24 hours at a time. Write a program that will calculate and print the parking charges for each of 3 customers who parked their cars in this garage yesterday. You should enter the hours parked for each customer. Your program should print the results in a neat tabular format and should calculate and print the total of yesterday's receipts. The program should use the function calculateCharges to determine the charge for each customer. Also, the program should use the function toCedis to conver from dollars to Ghana cedis equivalent [rate $1= GH4.43]. Your outputs should appear in the following
format:

Car	Hours	Charge in Dollars	Charge in Ghana Cedis
1	1.5	$2.00	GH8.86
2	4.0	$2.50	GH11.08
3	24.0	$10.00	GH44.32
4	18.0	$9.50	GH42.11
5	7.0	$4.00	GH17.73
6	13.9	$7.45	GH33.05
TOTAL	68.4	$35.45	GH148.27

Examiners: R.K Annan*/T. Kwantwi*