Mid-Term Exam (TEST01) – SECTION -002

Date: 20ᵗʰ June, 2021
Time: 9.00 am to 11.59 pm
Marks/Weightage: 50/25%

Student ID: _____

Name of Student: _____

Instructions: Be sure to read the following general instructions carefully:

This is an open book exam. You can refer text book, lab examples, study notes, ppts and can access internet. You can use lab computer or your laptop. Your IDE/Software is XCode 11 /Swift 4.0/5.0 which you need to complete this programming exercise.

This exam should be completed individually by all the students. You will have to upload the project/test **using Mid-Term Exam link on Blackboard**.

You must name your Xcode project according to the following rule:
Firstname-Lastname_CourseCode-Section_Mid-Term-Ex-01

For Example: Bob-Smith_COMP2125-002_Mid-Term_Ex-01

Zip the above folder into a zip file (**Bob-Smith_COMP2125-002_Mid-Term_Ex-01.zip**) and submit/upload your solution using the **Mid-Term Exam link** in Blackboard

Note: Academic dishonesty in any form is not allowed. You are not allowed to text, share, e-mail, and communicate during the test. This exam must be completed individually by all the students.

Very Important: You are required to upload the Mid-term exam on or before the due date. If someone fails to upload then there will be penalty of 50%.

Exercise 01:

Do the following using Swift Xcode project(*using macOS and choosing option/tab: Command line Tool*):
Create a class **StudentLoan** (store it in a separate file – StudentLoan.swift) which is having the following:

a) Student Loan number, Student name, yearly interest rate, student loan amount and duration (time period) as **stored properties**

b) Define private set for student name and loan number

c) Loan amount should not be negative or zero

d) Interest rate should be positive and between 2.0 and 5.0 % (including both). Default as 2.0

e) Time duration should be between 5 years min and 9 years as max. Default as 5.0

f) You need to define property observers – **didSet** for student loan amount, interest rate, and time

duration. *[15 marks – 3 marks for each property with validations implemented as mentioned]*

g) Tax exemption for student loan should be 1% of loan amount. Define it as **computed property** – **taxExemption**
(Note: this amount should be subtracted from loan amount while calculating the monthly installments.) *[5 marks]*

h) Define a deinitializer also. *[2 marks]*

i) Define **Description** as computed property which display all the instance data member's values of loan

object. This should be defined in the class extension file – **StudentLoanExtensions.swift** *[6 marks]*

j) Define **two initializers**, one which initializes all the properties to their default values and one which

initializes all the properties to their appropriate values. These two initializers should be defined in the

StudentLoan class. *[8 marks]*

k) And third one which is of the type convenience, which only initializes loan number, student name, student loan
amount. It should be defined in the class extension file – StudentLoanExtensions.swift. *[4 marks]*

l) Define a function- **CalculateMonthlyPayment() --> Double** { } which is used for calculating the monthly

installment payment on the amount based on the rate and time. [*Use formula: Interest = (loan amount – tax*

*exemption) * rate * time / 100. Monthly payment = ((loan amount – tax exemption) + Interest)/ (time * 12)* . [*6 marks*]

m) Test the above class in main.swift file by creating at least two objects of StudentLoan class and test its

capabilities. *[4 marks]*

Evaluation/Rubric:

Functionality	Weight
Correct implementation classes, functions and various class members and code logic as per business/functional requirements	70%
Correct use and testing of all the functionalities developed	20%
Comments, correct naming of variables, methods etc.	5%
User Friendly input/output	5%
Total	100%