

**National University**

**of Computer & Emerging Sciences Peshawar Campus**

fast-logo

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Roll No: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Examination: Sessional-II

Total Marks: 40 Weightage: 15%

Date: 09 May 2022

Instructor Name: Usama Musharaf

Program: BS(CS)-6

Semester: Spring-2022

Time Allowed: 1 hour

Course: \_\_Software Engineering\_\_

**NOTE:** Attempt all questions.

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| **Question # 1: Marks: [20] Time: [30 mins]** |

**Car Insurance Premium Scenario:**

The basic cost of an insurance premium for drivers is $500, however, this premium can increase or decrease depending on four factors i.e (age, gender, marital status, and a number of penalty points). Drivers that are below the age of 25, male and single face an additional premium increase of $1500. If a driver outside of this bracket is married or female, their premium reduces by $200, and if they are aged between 46 and 65 then their premium goes down by $100. Regardless of their status, a driver will be charged an extra $20 for each penalty point they have up to a maximum of 5. An entry of 0 is made for drivers with no penalty points.

The implementation of the car insurance premium scenario is given below:

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| 1. int CarInsurance (int age, char gender, Boolean married, int points)   {   1. Premium = 500; 2. If ( (age<25) && (gender = =’M’) && (!married) )   {   1. Premium += 1500;   }   1. else { 2. if ( married || gender = = ‘F’)   {   1. Premium - = 200;   }   1. if ( (age >45) && (age<65) )   {   1. Premium - = 100;   }  }   1. If (points > 5) 2. { Points= 5; } 3. Premium = Premium + points \*20; 4. return Premium;   } |

For a car insurance premium process program, draw a Control Flow Graph (CFG). By using this graph, justify how you would derive test cases for the following White Box Testing methods:

* Branch Testing
* Statement Testing

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| **Question # 2: Marks: [10] Time: [15 mins]** |

Give strong reasons for the following statements given below:

* Why event-driven architecture is not suitable for CPU-intensive applications.
* How Stateful Replication can affect the scalability and reliability of a system.
* It’s not always necessary that scaling up of resources (e.g processors) leads to a better performance, sometimes we observe a decline in performance, or may get even worse results. Write about those two factors that may be a cause of decline in performance.

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| **Question # 3: Marks: [10] Time: [15 mins]** |

* Briefly discuss the principles that would be ideal to measure performance and reliability of a system?

**GOOD LUCK!**