1 **(a)** The following are some examples. There are many correct responses for this question.

- engineSize
- valuePerThousand
- placeKept
- thousandDriven
- driverAge

[3]

(b) Programming concept: **Conditional Statements**

Explanation:

- Check to see whether the value of the driver's age lies between 26 and 70
- e.g. `IF driverAge >= 26 AND driverAge <= 70`
- If True, then check for the years without an insurance claim
- e.g. `IF yearsWithoutClaim >= 2`
- If True, then apply the discount.

[3]

(c) New price: **$875**

- Increases the price at the end of **Task 2** by 25%

Explanation:

- The age of the extra driver increases the price based on Table 1
- The price change for the driver's age range of 26-30 years is 25%
- $700 + 0.25 x $700

[3]

(d) The following are example programs. There are multiple correct solutions to this question.

Pseudocode:

```
DECLARE basePrice : INTEGER
DECLARE engine_size : REAL
DECLARE perc_change : Integer
DECLARE car_value : Real
DECLARE locationKept : STRING
DECLARE locationFlag : BOOLEAN
DECLARE thousandKilometerDriven : REAL
DECLARE driverAge : INTEGER
DECLARE yearsWithoutClaim : INTEGER
DECLARE discountPerc : INTEGER
DECLARE newCustDiscountPerc : INTEGER

DECLARE newPrice : REAL

basePrice = 500
perc_change = 0
engine_size = -1.0
car_value = -1000.0
locationFlag = False
thousandKilometerDriven = -1000.0
driverAge = 0
yearsWithoutClaim = -10



WHILE engine_size < 0

        OUTPUT "Enter the engine size in litres of fuel: "
        INPUT engine_size

        IF engine_size > 0.0 AND engine_size <= 0.5 THEN
                perc_change = perc_change – 5
        ELSEIF engine_size > 0.5 AND engine_size <= 1.0 THEN
                perc_change = perc_change + 0
        ELSEIF engine_size > 1.0 AND engine_size <= 2.5 THEN
                perc_change = perc_change + 5
        ELSEIF engine_size > 2.5 THEN
                perc_change = perc_change + 10
        ELSE
                OUTPUT "Please enter a valid engine size."
        END IF
END WHILE
```

```
WHILE car_value < 0
        OUTPUT "Enter the value of the car (in thousands): "
        INPUT car_value

        IF car_value > 0 AND Car_value < 0.5 THEN
                perc_change = perc_change – 5
        ELSEIF car_value >= 0.5 AND Car_value <= 2 THEN
                perc_change = perc_change + 0
        ELSEIF car_value > 2 AND Car_value <= 10 THEN
                perc_change = perc_change + 5
        ELSEIF car_value > 10 AND Car_value <= 20 THEN
                perc_change = perc_change + 10
        ELSEIF car_value > 20 THEN
                perc_change = perc_change + 15
        ELSE
                OUTPUT "Please enter a valid price."
        END IF
END WHILE

WHILE locationFlag = FALSE
        OUTPUT "Enter the location where the car is kept overnight (Garage/Drive/Street): "
        INPUT locationKept


        IF UPPER(locationKept) = "GARAGE" THEN
                locationFlag = TRUE
                perc_change = perc_change – 5
        ELSEIF UPPER(locationKept) = "DRIVE" THEN
                locationFlag = TRUE
                perc_change = perc_change + 0
        ELSEIF UPPER(locationKept) = "STREET" THEN
                locationFlag = TRUE
                perc_change = perc_change + 5
        ELSE
                OUTPUT "Please enter a valid location (Garage/Drive/Street)."
        END IF
END WHILE

WHILE thousandKilometerDriven < 0
        OUTPUT "Enter the kilometers driven per year (in thousands): "
        INPUT thousandKilometerDriven

        IF thousandKilometerDriven >= 0 AND thousandKilometerDriven < 5 THEN
                perc_change = perc_change – 5
```

```
        ELSEIF thousandKilometerDriven >= 5 AND thousandKilometerDriven <= 20 THEN
                perc_change = perc_change + 0
        ELSEIF thousandKilometerDriven > 20
                perc_change = perc_change + 5
        ELSE
                OUTPUT "Please enter a valid value for the thousands of kilometers driven."
        END IF
END WHILE

WHILE drivenAge < 18

        OUTPUT "Enter the age of the driver: "
        INPUT driverAge

        IF driverAge >= 18 AND drivenAge <= 20 THEN
                perc_change = perc_change + 100
        ELSEIF driverAge >= 21 AND driverAge <= 25 THEN
                perc_change = perc_change + 50
        ELSEIF driverAge >= 26 AND driverAge <= 30 THEN
                perc_change = perc_change + 25
        ELSEIF driverAge >= 31 AND driverAge <= 70 THEN
                perc_change = perc_change + 0
        ELSEIF driverAge >= 71 AND driverAge <= 80 THEN
                perc_change = perc_change + 10
        ELSEIF driverAge >= 80
                perc_change = perc_change + 20
        ELSE
                OUTPUT "Please enter a valid age."
        END IF
END WHILE

WHILE yearsWithoutClaim < 0
        OUTPUT "Enter the number of years without an insurance claim: "
        INPUT yearsWithoutClaim

        CASE OF yearsWithoutClaim
                0: discountPerc = 0
                1: discountPerc = 10
                2: discountPerc = 20
                3: discountPerc = 30
                4: discountPerc = 40
                5: discountPerc = 50
                6: discountPerc = 60
                >6: discountPerc = 70
        OTHERWISE
                OUTPUT "Please enter a valid argument."
```

```
        END CASE
END WHILE

OUTPUT "The price to insure your car is: $" & newPrice
OUTPUT "The total percentage change in the base price of insurance is: " & perc_change & "%"
OUTPUT "The percentage discount due to years without claim is: " & discountPerc & "%"
```

Programming Language: VB

```
Dim basePrice As Integer


Dim engine_size As Decimal
Dim perc_change As Integer
Dim car_value As Decimal
Dim locationKept As String
Dim locationFlag As Boolean
Dim ThousandKilometerDriven As Decimal
Dim driverAge As Integer
Dim yearsWithoutClaim As Integer
Dim discountPerc As Integer
Dim newCustDiscountPerc As Integer
Dim addDriverChoice As String
Dim newDriverAge As Integer


Dim newPrice As Decimal



basePrice = 500
perc_change = 0
engine_size = -1.0
Car_value = -1000.0
locationFlag = False
ThousandKilometerDriven = -1000.0
driverAge = 0
yearsWithoutClaim = -10
```

```
        While engine_size < 0
            Console.Write("Enter the engine size in litres of fuel: ")
            engine_size = Console.ReadLine
            If engine_size >= 0 And engine_size <= 0.5 Then : perc_change = perc_change - 5
            ElseIf engine_size > 0.5 And engine_size <= 1.0 Then : perc_change = perc_change
+ 0
            ElseIf engine_size > 1.0 And engine_size <= 2.5 Then : perc_change = perc_change
+ 5
            ElseIf engine_size > 2.5 Then : perc_change = perc_change + 10
            Else


                Console.WriteLine("Please enter a valid engine size.")
            End If
        End While


        While Car_value < 0


            Console.Write("Enter the value of the car (in thousands): ")
            Car_value = Console.ReadLine
            If Car_value > 0 And Car_value < 0.5 Then : perc_change = perc_change - 5
            ElseIf Car_value >= 0.5 And Car_value <= 2 Then : perc_change = perc_change + 0
            ElseIf Car_value > 2 And Car_value <= 10 Then : perc_change = perc_change + 5
            ElseIf Car_value > 10 And Car_value <= 20 Then : perc_change = perc_change + 10
            ElseIf Car_value > 20 Then : perc_change = perc_change + 15
            Else


                Console.WriteLine("Please enter a valid price.")
            End If
        End While


        While locationFlag = False


            Console.Write("Enter the location where the car is kept overnight
(Garage/Drive/Street): ")
            locationKept = Console.ReadLine
```

```
            If UCase(locationKept) = "GARAGE" Then
                locationFlag = True
                perc_change = perc_change - 5
            ElseIf UCase(locationKept) = "DRIVE" Then
                locationFlag = True
                perc_change = perc_change + 0
            ElseIf UCase(locationKept) = "STREET" Then
                locationFlag = True
                perc_change = perc_change + 5
            Else


                Console.WriteLine("Please enter a valid location (Garage/Drive/Street).")
            End If
        End While


        While ThousandKilometerDriven < 0


            Console.Write("Enter the kilometers driven per year (in thousands): ")
            ThousandKilometerDriven = Console.ReadLine
            If ThousandKilometerDriven >= 0 And ThousandKilometerDriven < 5 Then :
perc_change = perc_change - 5
            ElseIf ThousandKilometerDriven >= 5 And ThousandKilometerDriven <= 20 Then :
perc_change = perc_change + 0
            ElseIf ThousandKilometerDriven > 20 Then : perc_change = perc_change + 5
            Else


                Console.WriteLine("Please enter a valid value for the thousands of kilometers
driven.")
            End If
        End While


        While driverAge < 18


            Console.Write("Enter the age of the driver: ")
            driverAge = Console.ReadLine
```

```
    If driverAge >= 18 And driverAge <= 20 Then : perc_change = perc_change + 100
    ElseIf driverAge >= 21 And driverAge <= 25 Then : perc_change = perc_change + 50
    ElseIf driverAge >= 26 And driverAge <= 30 Then : perc_change = perc_change + 25
    ElseIf driverAge >= 31 And driverAge <= 70 Then : perc_change = perc_change + 0
    ElseIf driverAge >= 71 And driverAge <= 80 Then : perc_change = perc_change + 10
    ElseIf driverAge > 80 Then : perc_change = perc_change + 20
    Else


        Console.WriteLine("Please enter a valid age.")
    End If
End While


newPrice = basePrice + (perc_change / 100) * basePrice


While yearsWithoutClaim < 0


    Console.Write("Enter the number of years without an insurance claim: ")
    yearsWithoutClaim = Console.ReadLine
    Select Case yearsWithoutClaim
        Case 0 : discountPerc = 0
        Case 1 : discountPerc = 10
        Case 2 : discountPerc = 20
        Case 3 : discountPerc = 30
        Case 4 : discountPerc = 40
        Case 5 : discountPerc = 50
        Case 6 : discountPerc = 60
        Case Is > 6 : discountPerc = 70
        Case Else


            Console.WriteLine("Please enter a valid argument.")
    End Select
End While


'ADDITIONAL CODE FOR TASK 3 BEGINS HERE'
```

```
        Console.Write("Would you like to add another driver? (Y/N) ")
        addDriverChoice = Console.ReadLine
        If UCase(addDriverChoice) = "Y" Then
            newDriverAge = 0
            While newDriverAge < 18


                Console.Write("Enter the age of the second driver: ")
                newDriverAge = Console.ReadLine
                If newDriverAge >= 18 And newDriverAge <= 20 Then : perc_change = perc_change
+ 100
                ElseIf newDriverAge >= 21 And newDriverAge <= 25 Then : perc_change =
perc_change + 50
                ElseIf newDriverAge >= 26 And newDriverAge <= 30 Then : perc_change =
perc_change + 25
                ElseIf newDriverAge >= 31 And newDriverAge <= 70 Then : perc_change =
perc_change + 0
                ElseIf newDriverAge >= 71 And newDriverAge <= 80 Then : perc_change =
perc_change + 10
                ElseIf newDriverAge > 80 Then : perc_change = perc_change + 20
                Else


                    Console.WriteLine("Please enter a valid age.")
                End If
            End While


        End If

    Console.WriteLine("The total percentage change in the base price of insurance is: " &
    perc_change & "%")

    Console.WriteLine("The percentage discount due to years without claim is: " & discountPerc
    & "%")

    Console.WriteLine("The price to insure your car is: $" & newPrice)
```

Programming Language: Python

```
basePrice = 500

perc_change = 0
engine_size = -1.0
car_value = -1000.0
locationFlag = False
thousandKilometerDriven = -1000.0
driverAge = 0
yearsWithoutClaim = -10


while engine_size < 0:
    engine_size = float(input("Enter the engine size in litres of fuel: "))
    if 0 <= engine_size <= 0.5: perc_change = perc_change - 5
    elif 0.5 < engine_size <= 1.0: perc_change = perc_change + 0
    elif 1.0 < engine_size <= 2.5: perc_change = perc_change + 5
    elif engine_size > 2.5: perc_change = perc_change + 10
    else: print("Please enter a valid engine size.")


while car_value < 0:
    car_value = float(input("Enter the value of the car (in thousands): "))
    if 0 < car_value < 0.5: perc_change = perc_change - 5
    elif 0.5 <= car_value <= 2: perc_change = perc_change + 0
    elif 2 < car_value <= 10: perc_change = perc_change + 5
    elif 10 < car_value <= 20: perc_change = perc_change + 10
    elif car_value > 20: perc_change = perc_change + 15
    else: print("Please enter a valid price.")


while not locationFlag:
    locationKept = input("Enter the location where the car is kept overnight
(Garage/Drive/Street): ")
    if locationKept.upper() == "GARAGE":
        locationFlag = True
        perc_change = perc_change - 5
    elif locationKept.upper() == "DRIVE":
        locationFlag = True
        perc_change = perc_change + 0
    elif locationKept.upper() == "STREET":
```

```
            locationFlag = True
            perc_change = perc_change + 5
        else: print("Please enter a valid location (Garage/Drive/Street).")


while thousandKilometerDriven < 0:
    thousandKilometerDriven = float(input("Enter the kilometers driven per year (in thousands):
"))
    if 0 <= thousandKilometerDriven < 5: perc_change = perc_change - 5
    elif 5 <= thousandKilometerDriven <= 20: perc_change = perc_change + 0
    elif thousandKilometerDriven > 20: perc_change = perc_change + 5
    else: print("Please enter a valid value for the thousands of kilometers driven.")


while driverAge < 18:
    driverAge = int(input("Enter the age of the driver: "))
    if 18 <= driverAge <= 20: perc_change = perc_change + 100
    elif 21 <= driverAge <= 25: perc_change = perc_change + 50
    elif 26 <= driverAge <= 30: perc_change = perc_change + 25
    elif 31 <= driverAge <= 70: perc_change = perc_change + 0
    elif 71 <= driverAge <= 80: perc_change = perc_change + 10
    elif driverAge > 80: perc_change = perc_change + 20
    else: print("Please enter a valid age.")


while yearsWithoutClaim < 0:
    yearsWithoutClaim = int(input("Enter the number of years without an insurance claim: "))
    if yearsWithoutClaim == 0: discountPerc = 0
    elif yearsWithoutClaim == 1: discountPerc = 10
    elif yearsWithoutClaim == 2: discountPerc = 20
    elif yearsWithoutClaim == 3: discountPerc = 30
    elif yearsWithoutClaim == 4: discountPerc = 40
    elif yearsWithoutClaim == 5: discountPerc = 50
    elif yearsWithoutClaim == 6: discountPerc = 60
    elif yearsWithoutClaim > 6: discountPerc = 70
    else: print("Please enter a valid argument.")

print("The total percentage change in the base price of insurance is:{}%".format(perc_change))
print("The price to insure your car is: ${}".format(newPrice))
print("The percentage discount due to years without claim is: {}%".format(discountPerc))
```

[6]

(e) The following are example programs. There are multiple correct solutions to this question.

Pseudocode:

```
IF driverAge >= 26 AND driverAge <= 70 THEN
        IF yearsWithoutClaim >= 2 THEN
                newCustDiscountPerc = 10
        END IF

END IF

OUTPUT "The amount of money saved by applying the 'new customer discount' is: $" & (newPrice *
(newCustDiscountPerc / 100))
```

Programming Language: VB

```
If driverAge >= 26 And driverAge <= 70 Then

        If yearsWithoutClaim >= 2 Then
                newCustDiscountPerc = 10
        End If

End If

Console.WriteLine("The amount of money saved by applying the 'new customer discount' is: $" &
(newPrice * (newCustDiscountPerc / 100)))
```

Programming Language: Python

```
newCustDiscountPerc = 0

if 26 <= driverAge <= 70:

        if yearsWithoutClaim >= 2: newCustDiscountPerc = 10

print("The amount of money saved by applying the 'new customer discount' is: ${}".format(newPrice
* (newCustDiscountPerc / 100)))
```

[4]

(f) The following is an example solution. There are multiple correct solutions to this question.

- User is prompted to choose whether or not to add another driver
- If the user chooses to add another driver, a new variable for the driver's age is initialized
- The user is prompted to enter the age of the driver
- Conditional statements for age range apply the correct change in price.
- If the age is out of the allowed range, an error message is generated.

Pseudocode:

```
OUTPUT "Would you like to add another driver? (Y/N) "
INPUT addDriverChoice

IF UPPER(addDriverChoice) = "Y" THEN
        newDriverAge = 0

        WHILE newDriverAge < 18
                OUTPUT "Enter the age of the second driver: "
                INPUT newDriverAge


                IF newdriverAge >= 18 AND newdrivenAge <= 20 THEN
                        priceChangePerc = priceChangePerc + 100
                ELSEIF newdriverAge >= 21 AND newdriverAge <= 25 THEN
                        priceChangePerc = priceChangePerc + 50
                ELSEIF newdriverAge >= 26 AND newdriverAge <= 30 THEN
                        priceChangePerc = priceChangePerc + 25
                ELSEIF newdriverAge >= 31 AND newdriverAge <= 70 THEN
                        priceChangePerc = priceChangePerc + 0
                ELSEIF newdriverAge >= 71 AND newdriverAge <= 80 THEN
                        priceChangePerc = priceChangePerc + 10
                ELSEIF newdriverAge >= 80
                        priceChangePerc = priceChangePerc + 20
                ELSE
                        OUTPUT "Please enter a valid age."
                END IF
        END WHILE
END IF
```