1

a. inputs: price per gallon (ppg), number of gallons purchased (gal), payment method (paymethod)
b. outputs: cost of gas transaction (price)
c. error conditions: ppg <= 0, gal <= 0
d. Minimum number of operations: 8
e. Maximum number of operations: 9

```
READ ppg
READ gal
READ paymethod
SET price to 0
IF ppg <= 0 or gal <= 0, THEN
        DISPLAY error
ELSE
        IF paymethod = cash, THEN
                COMPUTE price as ppg * gal
        ELSE
                COMPUTE price as ppg * gal * 1.1
        ENDIF
ENDIF
DISPLAY price
```

Test Case 1: ppg = 1, gal = 2, paymethod= cash, price = 2, display 2
Test Case 2: ppg = -1, gal = 5, paymethod = credit, display error
Test Case 3: ppg = 4, gal = 3, paymethod = credit, price = 13, display 13.2

2

a. inputs: age, location
b. outputs: price
c. error conditions: age <= 0 or age >120
d. Minimum number of operations: 7
e. Maximum number of operations: 11

```
READ age
READ location
SET price to 0
IF age <= 0 or age > 120, THEN
        DISPLAY error
ELSE
        IF age < 7, THEN
                SET price as 0
        ELSEIF age <= 65
                SET price as 13.20
        ELSE
                SET price as 7.50
        ENDIF
ENDIF
IF location = inside train, THEN
        COMPUTE price as 1.2 * price
ENDIF
DISPLAY price
```

Test Case 1: age = 7, location = inside train, price = 15.84, display 15.84
Test Case 2: age = 0, location = outside train, display error
Test Case 3: age = 65, location = outside train, price = 13.20, display 13.20
Test Case 4: age = 66, location = inside train, price = 9, display 9

3

a. inputs: number of hours spent programming (n)
b. outputs: prize
c. error conditions: n < 0
d. Minimum number of operations: 5
e. Maximum number of operations: 12

```
READ n
SET price to 0
IF n < 0, THEN
        DISPLAY “Error”
ELSEIF n = 0, THEN
        SET prize as “No prize”
ELSE
        IF n >= 1 and n <= 5, THEN
                SET prize as “T-Shirt”
        ELSEIF n >= 1 and n <= 400
                IF (n % 10 == 9), THEN
                        SET prize as “laptop ”
                ENDIF
                IF (n % 2 == 0), THEN
                        COMPUTE prize as prize + “hat ”
                ENDIF
                IF (n % 3 == 0), THEN
                        COMPUTE prize as prize + “TV ”
                ENDIF
        ELSEIF (n > 400)
                SET prize as “cat “
        ENDIF
ENDIF
DISPLAY “Prizes: “ + prize
```

Test Case 1: n = -1, display error
Test Case 2: n = 0, prize = “no prize”, display “no prize”
Test Case 4: n = 4, prize = “T-Shirt”, display “T-Shirt”
Test Case 4: n = 29, prize = “laptop “, display “laptop “
Test Case 5: n = 9, prize = “laptop TV”, display “laptop TV”
Test Case 6: n = 6, prize = “hat TV”, display “hat TV”

4

a. inputs: number (n)
b. outputs: number of 7s (count)
c. error conditions: n < 0
d. Minimum number of operations: 5
e. Maximum number of operations: Depends on value

```
READ n
SET count to 0
IF n < 0, THEN
        DISPLAY “Error”
Else
        WHILE n > 0
                IF n % 10 == 7, THEN
                        COMPUTE count as count + 1
                ENDIF
                COMPUTE n as n / 10
        ENDWHILE
ENDIF
DISPLAY count
```

Test Case 1: n = -1, display “Error”
Test Case 2: n = 2, display “0”
Test Case 4: n = 37727, display “3”