Answer 1 -

The range here is 0 to 100 inclusive. The volume unit is in gallons.

0.00 25	25.01 49.99	50.00 75.00	75.01 99.99	100

	Inputs	**Expected Output**
Test Case	**Volume in Tank**	**Status**
Case 1	0.00	Empty
Case 2	25.00	Empty
Case 3	25.01	¼ Full
Case 4	49.99	¼ Full
Case 5	50.00	½ Full
Case 6	75.00	½ Full
Case 7	75.01	¾ Full
Case 8	99.99	¾ Full
Case 9	100.00	Full

Answer 2 -

The range here for the altitude is 0 to 200 inclusive. The distance is in feet and the velocity is in feet per second. Drone altitude and forward velocity are both doubles with 0.1 significance.

0.0 0.4	0.5 24.9	25.0 50.0	50.1 74.9	75.0 100.0	100.1 200.0

	Inputs	**Expected Output**	
Test Case	**Altitude**	**Velocity**	**Status of Motor**
Case 1	0.0	0.0	Off
Case 2	0.4	0.0	Off
Case 3	0.5	2.5	Running
Case 4	24.9	2.5	Running
Case 5	25.0	5.0	Running
Case 6	50.0	5.0	Running
Case 7	50.1	10.0	Running
Case 8	74.9	10.0	Running
Case 9	75.0	15.0	Running
Case 10	100.0	15.0	Running
Case 11	100.1	25.0	Running
Case 12	200.0	25.0	Running

Answer 3 -

-□ -0.01	0.00	0.01 799.99	800.00 3499.99	3500.00 242353.73	242353.74 □

	Inputs	Expected Output		
Test Case	**Initial Balance**	**Fee**	**Credit**	**Final Balance**
Case 1	-200.00	-500		-700.00
Case 2	-0.01	-500		-500.01
Case 3	0.00	-150		-150.00
Case 4	0.01			0.01
Case 5	799.99			812.38
Case 6	800.00			818.04
Case 7	3499.99			3578.91
Case 8	3500.00			3610.42
Case 9	242353.73			250000.00
Case 10	242353.74		100	250100.01
Case 11	290824.48		100	300100.00

	Rule 1	**Rule 2**	**Rule 3**	**Rule 4**	**Rule 5**	**Rule 6**
Conditions						
-0.01 >= Initial Balance	T					
Initial Balance = 0.00		T				
0.01 >= Initial Balance >= 799.99			T			
800.00 >= Initial Balance >= 3499.99				T		
3500 >= Initial Balance >= 242353.73					T	
Initial Balance >= 242353.74						T
Actions						
Overdraft Fee	500	-	-	-	-	-
Credit Amount	-	-	-	-	-	100
Disuse Fee	-	150	-	-	-	-
Interest Percent	-	-	1.55	2.255	3.155	3.155

Answer 4 -

a. The number of test cases for this problem comes out to be 9 based on the decision table and we the number of test cases is 9 as well.

	Rule 1	**Rule 2**	**Rule 3**	**Rule 4**	**Rule 5**
Conditions					
Volume = 100.00	T				
99.99 >= Volume >= 75.01		T			
75.00 >= Volume >= 50.00			T		
49.99 >= Volume >= 25.01				T	
25.00 >= Volume >= 0.00					T
Actions					
Status	Full	3/4 Full	1/2 Full	1/4 Full	Empty

b. The number of test cases for this problem comes out to be 12 based on the decision table which is equal to the number of test cases defined above.

	Rule 1	**Rule 2**	**Rule 3**	**Rule 4**	**Rule 5**	**Rule 6**
Conditions						
Altitude >= 100.01	T					
100.00 >= Altitude >= 75.0		T				
74.9 >= Altitude >= 50.1			T			
50.0 >= Altitude >= 25.0				T		
24.9 >= Altitude >= 0.5					T	
0.4 >= Altitude >= 0.00						T
Actions						
Velocity in fps	25	15	10	5	2.5	0
Status of motor	On	On	On	On	On	Off

c. The number of test cases for this problem comes out to be 11 based on the decision table. The actual number of test cases is 11 as well

	Rule 1	**Rule 2**	**Rule 3**	**Rule 4**	**Rule 5**	**Rule 6**
Conditions						
-0.01 >= Initial Balance	T					
Initial Balance = 0.00		T				
0.01 >= Initial Balance >= 799.99			T			
800.00 >= Initial Balance >= 3499.99				T		
3500 >= Initial Balance >= 242353.73					T	
Initial Balance >= 242353.74						T
Actions						
Overdraft Fee	500	-	-	-	-	-
Credit Amount	-	-	-	-	-	100
Disuse Fee	-	150	-	-	-	-
Interest Percent	-	-	1.55	2.255	3.155	3.155

Answer 5 -

Input table

Label	Meaning	Type	Significance
S	Start button	Boolean	When true leads to Ready state
H	Sensor that checks for Gas Pump Nozzle Head removed from its holster.	Boolean	If true it displays the message dispensing
F	Checks the status of the Gas Pump Nozzle Flow Handle.	Boolean	If true it starts the flow of gas
D	Numeric value truncated to one decimal place	Numeric	Keeps track of the amount of fuel dispensed when the flow handle is pressed
T	Represents the stop button	Boolean	If true stops the fuel flow
C	Button that resets the gas pump	Boolean	If true resets the system and displays welcome message

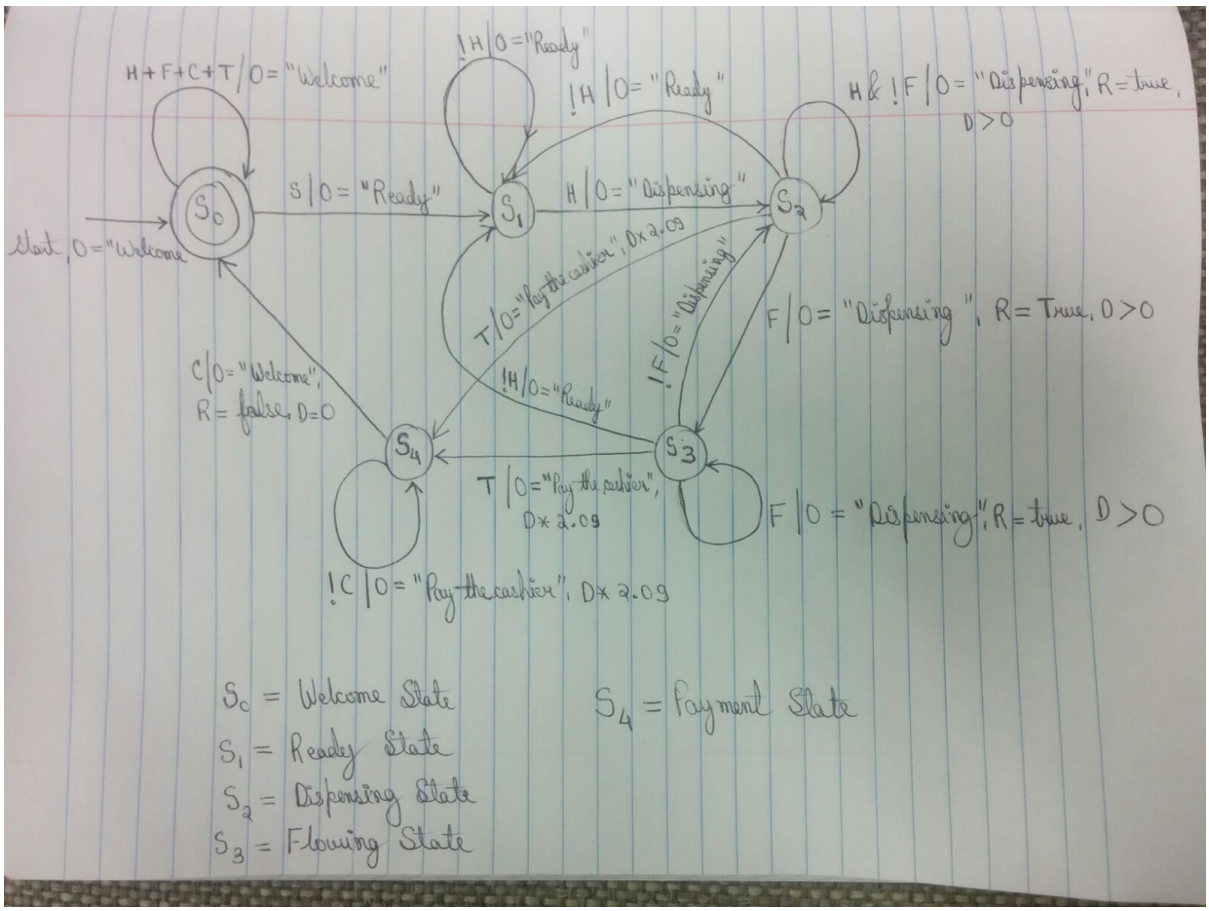
Output Table

Label	Means	Type	Significance
D	Numeric value truncated to one decimal place	Numeric	Keeps track of the amount of fuel dispensed when the flow handle is pressed
O	Displays the message on the display panel.	String	The different messages we get are “Welcome”, “Ready”, “Dispensing”, “Please pay cashier” based on different states
R	Output of the software used to turn on the pump motor which dispenses gas.	Boolean	This keeps on running as long as the cashier does not reset the system.

Test Table

	Input							Output		
Test Case	**Current State**	**S**	**H**	**F**	**T**	**C**	**D**	**D**	**O**	**R**	**New State**
Case 1	Start	F	F	F	F	F	0	0	Welcome	F	S0
Case 2	S0	T	F	F	F	F	0	0	Ready	F	S1
Case 3	S0	F	T	T	T	T	0	0	Ready	F	S0
Case 4	S1	T	T	F	F	F	0	0	Dispensing	F	S2
Case 5	S1	T	F	T	T	T	0	0	Ready	F	S1
Case 6	S2	T	T	T	F	F	0	0	Dispensing	T	S3
Case 7	S2	T	T	F	T	F	0	0	Pay the cashier	F	S4
Case 8	S2	T	F	F	F	F	0	0	Ready	F	S1
Case 9	S2	T	T	F	F	F	0	0	Dispensing	R	S2
Case 10	S2	T	T	F	F	T	0	0	Dispensing	R	S2
Case 11	S3	T	T	F	F	F	Amount of Fuel	Amount of Fuel	Dispensing	T	S2
Case 12	S3	T	T	F	T	F	Amount of Fuel	Amount of Fuel	Pay the cashier	T	S4
Case 13	S3	T	T	T	T	F	Amount of Fuel	Amount of Fuel	Pay the cashier	T	S4
Case 14	S3	T	F	T	T	T	0	0	Ready	F	S1
Case 15	S3	T	T	T	F	F	Amount of Fuel	Amount of Fuel	Dispensing	T	S3
Case 16	S3	T	T	T	F	T	Amount of Fuel	Amount of Fuel	Dispensing	T	S3
Case 17	S4	T	F	F	F	T	Amount of Fuel	0	Welcome	F	S0
Case 18	S1	T	T	T	F	F	0	0	Dispensing	F	S3
Case 19	S4	T	T	F	T	F	Amount of Fuel	Amount of Fuel	Pay the cashier	T	S4
Case 20	S4	T	T	T	T	F	Amount of Fuel	Amount of Fuel	Pay the cashier	T	S4
Case 21	S4	T	T	F	T	T	0	0	Welcome	F	S0
Case 22	S4	T	F	F	T	T	0	0	Welcome	F	S0

State Diagram Below


H+F+C+T/O="Welcome"
!H/O="Ready"
!H/O="Ready"
H&!F/O="Dispensing", R=true, D>0
S/O="Ready"
H/O="Dispensing"
start, O="Welcome"
S0
S1
S2
T/O="Pay the cashier", D*2.09
!F/O="Dispensing"
F/O="Dispensing", R=True, D>0
C/O="Welcome", R=false, D=0
!H/O="Ready"
S4
S3
T/O="Pay the cashier", D*2.09
F/O="Dispensing", R=true, D>0
!C/O="Pay the cashier", D*2.09
S0 = Welcome State
S1 = Ready State
S2 = Dispensing State
S3 = Flowing State
S4 = Payment State