**Question 4**

**Decision table:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Rule 1** | **Rule 2** | **Rule 3** | **Rule 4** |
| **Conditions** | | | | |
| landing | FALSE | TRUE | TRUE | TRUE |
| 0.0 <= speed (mph) <= 149.9 |  |  |  | Other values |
| 150.0 <= speed (mph) <= 500.0 |  | Y |  |
| 500.1 <= speed (mph) <= 1,000.0 |  |  | Y |
| 0.0 <= altitude (feet) <= 1,000.0 |  |  |  |
| 1,000.1 <= altitude (feet) <= 2,499.9 |  | Y |  |
| 2,500.0 <= altitude (feet) <= 4,999.9 |  |  | Y |
| 5,000.0 <= altitude (feet) <= 10,000.0 |  |  |  |
| **Actions** | | | | |
| action | disengageRetro | deployPods | engageRetro | orbit |
| **Table implements "first-of" rule** | | | | |

**Test case table:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test Case Number** | Inputs | | | Exp Out | Basis Path | MCDC | Comments |
| landing | speed (mph) | altitude (ft.) | return |
| 1 | TRUE | 500.1 | 2,500.0 | engageRetro | 10-11-12-13-14-22 | stmt 11-14 TTT |  |
| 2 | FALSE | 500.1 | 2,500.0 | disengageRetro | 10-21-22 |  |  |
| 3 | TRUE | 500.1 | 2,499.9 | orbit | 10-11-12-22 | stmt 11-14 TFT |  |
| 4 | TRUE | 149.9 | 2,499.9 | orbit | 10-11-16-22 |  |  |
| 5 | TRUE | 500.1 | 5,000.0 | orbit | 10-11-12-13-22 | stmt 11-14 TTF |  |
| 6 | TRUE | 150.0 | 1,000.0 | orbit | 10-11-16-17-22 | stmt 16-19 TFT |  |
| 7 | TRUE | 150.0 | 2,500.0 | orbit | 10-11-16-17-18-22 | stmt 16-19 TTF |  |
| 8 | TRUE | 150.0 | 1,000.1 | deployPods | 10-11-16-17-18-19-22 | stmt 16-19 TTT |  |
| 9 | TRUE | 0.0 | 1,000.1 | orbit | - |  | Extreme range test for speed |
| 10 | TRUE | 1,000.0 | 1,000.1 | orbit | - |  | Extreme range test for speed |
| 11 | TRUE | 1000.0 | 0.0 | orbit | - |  | Extreme range test for altitude |
| 12 | TRUE | 1,000.0 | 10,000.0 | orbit | - |  | Extreme range test for altitude |
| 13 | FALSE | 500.1 | 4,999.9 | disengageRetro | - | stmt 11-14 FTT | Missing MCDC |
| 14 | FALSE | 149.9 | 1,000.1 | disengageRetro | - | stmt 16-19 FTT | Missing MCDC |

Code coverage achieved is: full boundary coverage, full statement coverage, full decision coverage and extreme range coverage.

The test cases support the description (logical expression).