FreeFlyer® Level 1 Certification: Sample Solutions

1. Which of the following forces is not configured through a Spacecraft object's ForceModel?
   a. Drag
   b. Lift
   c. Propulsion
   d. Solar Radiation Pressure

2. Which of the following are attitude systems available for use with Spacecraft?
   a. Euler Angles
   b. Attitude Matrix (DCM)
   c. Quaternions
   d. All of the above

3. Which of the following is not directly available as an Orbit Wizard within the Spacecraft object dialog?
   a. Sun-Synchronous Orbit
   b. Highly Elliptical Orbit (HEO)
   c. Molniya Orbit
   d. Geosynchronous Orbit (GEO)

4. Why might you use a Variable Step Size rather than a Fixed Step Size?
   a. To increase the fidelity of the simulation
   b. To achieve consistent data output intervals
   c. To control step size with a Variable object
   d. To save run time

5. Which Ephemeris file format is not natively supported?
   a. Code 500 PC Ephemeris
   b. CCSDS OEM
   c. SPICE
   d. HEO Transfer Ephemeris

6. How can Formation objects be initialized?
   a. Norad TLE
   b. SP3 Precise Ephemeris
   c. Manually
   d. All of the above

7. Which of the following cannot be used with the Report command?
   a. ConsoleWindow
   b. DataTableWindow
   c. PlotWindow
   d. External Files

8. Which command will output a plot in terms of angle and radius pairs?
   a. Plot
   b. AngularPlot
   c. Monitor
   d. **PolarPlot**
9. What is the difference between the View and Map commands?
   a. The Map command displays only GroundStation data while the View command displays only Spacecraft data
   b. **The Map command displays objects in a 2D view while the View command displays objects in a 3D view**
   c. The Map command includes political boundaries overlayed on the planet while the View command does not
   d. They can be used interchangeably with different inputs
10. Why might you use a GraphicsOverlay Object?
    a. To overlay fixed data on top of a ViewWindow that won't move around even when the Viewpoint is changed
    b. To display custom graphics as an overlay on a PlotWindow that will update when new values are added to the plot
    c. **To display custom graphics inside a ViewWindow that is attached to objects in the view and will move around when the Viewpoint is changed**
    d. None of the above options describe the use-case for a GraphicsOverlay
11. Which of the following is not a valid flow control statement?
    a. Break
    b. Pause
    c. Stop
    d. **Hold**
12. Which of the following is a viable means by which to get data into a Procedure?
    a. Passing the data in as an argument
    b. Populating a global object with the data
    c. Reading the data in from a file
    d. **All of the above**
13. Why might you use a VisibilityCalculator instead of a VisibilitySegment?
    a. **To manage VisibilitySegment objects when calculating chain visibility**
    b. To save on computational resources and improve performance
    c. To perform occultation analyses using terrain data
    d. To incorporate effects due to refraction into the line of sight calculations

14. What happens if propagation begins or ends during an interval method event?
    a. FreeFlyer calculates the actual start/end of the event and reports that as the event time
    b. FreeFlyer will automatically step to the beginning of the next event/end of the current event
    c. **FreeFlyer will report the start/end time of propagation as the start/end time of the event**
    d. FreeFlyer does not process or report partial events
15. Why might you use an ImpulsiveBurn?
    a. To model a complex burn using additional hardware
    b. **To model an instantaneous burn without additional hardware**
    c. To model a burn without mass depletion
    d. None of the above
16. Which object type exists purely to connect multiple Tank objects to a Thruster object?
    a. Mixer
    b. Connector
    c. **Valve**
    d. None of the above
17. Which of the following objects is not available for configuration as part of Spacecraft orbit determination?
    a. GPSReceiver
    b. **Antenna**
    c. Transponder
    d. TDRSTransponder
18. Which object is used to connect with Matlab?
    a. **MatlabInterface**
    b. MatlabConnector
    c. Matlab
    d. MatlabCOM
19. Which of the following is a valid use-case for a custom CelestialObject?
    a. Asteroid
    b. Comet
    c. Planet
    d. **All of the above**
20. Which of the following cannot be edited on the Plot User Preferences page?
    a. **Time between updates**
    b. Points between update
    c. Maximum points per plot
    d. Visibility of the data culling warning