**NN220 Celestial Navigation – STELLA In Class Exercise (2)**

**STELLA**

**Assumptions:**

Height of Eye is 57ft

Index Error 3.2’ Off the Arc

Air Temp 50°F (10°C)

Pressure 1000 mb.

**Question 1**.

It is 231630ZNov21 and you have a good fix that puts you in 41º 40’N 068**º** 45”W. You are on course 130ºT at 12 knots.Enter this into STELLA as your reference position.

**Question 2**.

You start work on preparing your Evening star sights.

1. Using the RISE/SET/ TRANSIT function, determine the following:

|  |  |  |  |
| --- | --- | --- | --- |
| **Time of Sunset and Azimuth** |  | **DR Position** |  |
| **Time for End Civil Twilight** |  | **DR Position** |  |
| **Time for End of Nautical Twilight** |  | **DR Position** |  |

1. Using the SKY CHART function, determine the best 3 stars for sights at Evening Twilight. Identify the 2 alternate bodies by the Height Calculated and Azimuth.

|  |  |  |
| --- | --- | --- |
| **Celestial Body** | **Height Calculated** | **Azimuth (Zn)** |
|  |  |  |
|  |  |  |
|  |  |  |
|  | 41° | 001°T |
|  | 33° | 162°T |

1. Using the SELECTED STARS function, determine the 4 other Stars (Not the Best Stars) Altitude and Azimuth at 232135ZNOV21.

|  |  |  |
| --- | --- | --- |
| **Celestial Body** | **Height Calculated** | **Azimuth (Zn)** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Question 3.**

Preparing to conduct Evening Stars, you are dismayed to see that it is partly cloudy therefore you can only see four celestial bodies. You therefore obtain the following sights:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Celestial Body** | **Time (Z)** | **Altitude** | **Azimuth** | **Quality** |
| Mirfak | 21:15:00Z | 26° 05 | 045 | Good |
| Jupiter | 21:21:00Z | 33°37.1 | 166 | Avg |
| VEGA | 21:28:15Z | 61°12.1 | 278 | Good |
| Kochab | 21:35:30 | 37°35 | 340 | Good |

1. Identify the 2 unknown Bodies you sighted.
2. Using the results of the star sights, what is the ship’s position at the time of last observation?

|  |  |
| --- | --- |
| **Latitude N 41deg 0.2.3’** | **Accuracy +-3.5’** |
| **Longitude W 067deg 53.7’** | **Accuracy +-4.6’** |

1. You are not convinced that your fourth sighted objected was accurate. Remove sight D from the Plot Solution. What is the revised position and accuracy?

|  |  |
| --- | --- |
| **Latitude** | **Accuracy** |
| **Longitude** | **Accuracy** |

**Question 4**.

1. Use STELLA to determine the time of Nautical and Civil Twilight and the time and Azimuth (true bearing) of Sunrise for the next morning based on your new fix position, once the 4th Sight is removed. Write your answers in DTG format.

Nautical Twilight

Civil Twilight

Sunrise

1. At time 1113Z you take an azimuth to the sun and get 117°T. Your Height of Eye is 57ft. What is your gyro Error?

**Question 5**

It is important to keep you fix updated during the day, therefore you take 3 sights of the Sun’s Lower Limb. Calculate the updated fix position based on the following sights:

|  |  |  |
| --- | --- | --- |
| **Time (Z)** | **Altitude** | **Quality** |
| 241340Z | 21°20.0 | Good |
| 241604Z | 30°30.5 | Good |
| 241832Z | 20°50.3 | Good |

1. Using the results of the Sun sights, what is the ship’s position at the time of last observation?

|  |  |
| --- | --- |
| **Latitude** | **Accuracy** |
| **Longitude** | **Accuracy** |

It is not a good fix, but fortunately it is close to Sunset and the weather looks good for evening sights.