**NN220 Celestial Navigation – STELLA In Class Exercise (1)**

**STELLA**

**Assumptions:**

Height of Eye is 63ft

Index Error 3.5’ On the Arc

Air Temp 50°F (10°C)

Pressure 1000 mb.

**Question 1**.

It is 161230ZJul21 and you have a good fix that puts you in 38º 50’N 073**º** 33”W. You are on course 090ºT at 10 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** | 170009ZJUL21 / 299T | **DR Position** | 38°50N 071° 03.9W |
| **Time for End Civil Twilight** | 170039ZJUL21 | **DR Position** | 38°50N 070° 57.6W |
| **Time for End of Nautical Twilight** | 170116ZJUL21 | **DR Position** | 38°50N 070° 49.5W |

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)** |
| Dubhe | 48° | 323°T |
| Spica | 35° | 210°T |
| Altair | 20° | 094°T |
| Polaris | 38° | 000°T |
| Mars | 16° | 277°T |

1. Using the SELECTED STARS function, determine the 3 Best Stars at 170104ZJUL21.

|  |  |  |
| --- | --- | --- |
| **Celestial Body** | **Height Calculated** | **Azimuth (Zn)** |
| Deneb | 38°57’ | 058°T |
| Antares | 24°18’ | 172°T |
| Alkaid | 62° 25’ | 305°T |

1. What is the moon’s illumination? \_\_45%\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Question 3.**

While on watch during the evening, 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** |
| Unknown | 00:33:00Z | 11° 36 | 280 | Good |
| Dubhe | 00:34:30Z | 44°36.7 | 322 | Avg |
| Unknown | 00:36:00Z | 52°11.9 | 124 | Good |
| Deneb | 00:38:00 | 34°52.6 | 056 | Avg |

1. Identify the 2 unknown Bodies you sighted.

Mars

Rasalhague

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

|  |  |
| --- | --- |
| **Latitude** 38°51.6’N | **Accuracy** +/- 8.8 |
| **Longitude** 070°59.4’W | **Accuracy** +/- 6.3 |

**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.

Nautical Twilight 170817ZJUL21

Civil Twilight 170855ZJUL21

Sunrise 170924ZJUL21 / 062

1. At time 0924Z you take an azimuth to the sun and get 063°T. Your Height of Eye is 63ft. What is your gyro Error?

1**º** East (Subtract 1**º)**