SEO 03 :

- NDVI

- Spectral Signature

- Change Detection

- Visual Change Detection

- Backscattering for water

- Min distance classification

False color\*

\_Change detection\*

\_NDVI\*\*

\_Temprature. (ocean surface and volcano) volcano how detect in diff band and resolution \*

\_Wind scattermeter(explain with formula and why we need 3 radar) \* \* \*

\_Classification supervised and unsupervised \*

Star means importance of question and probability of be your exam question

SEO 02 :

- Wisk broom

- Push Broom

- Enhance the Image

- Dwell Time ( All relationships)

- Histogram Equalization

- Radar (Resolution)

- Radiometric Calibration

- Reflectance on top of the atmosphere

- Special Resolution

- Spectral Resolution

- Radiometric Resolution

- Atmospheric effects on the ...

- Image Registration

- Geometric Distortion

SEO 01 :

Geostationary

Sun-synchronous

Geosynchronous

Ground track

Hohman transfer

What else?

Kepler's law

Nadir and Zenit

Apogee and Perigee

Nodal procession rate

Fundamental interval

Geostationary and geosynchronous orbits are both types of orbits around the Earth, but they differ in their specific characteristics.

A geostationary orbit is a circular orbit around the Earth's equator at an altitude of approximately 36,000 kilometers. In a geostationary orbit, a satellite's orbital period matches the Earth's rotational period, which means that the satellite appears to remain stationary over a fixed point on the Earth's surface. This is useful for applications such as weather forecasting, satellite television, and telecommunications.

On the other hand, a geosynchronous orbit is also a circular orbit around the Earth's equator, but it has a slightly higher altitude of approximately 42,000 kilometers. In a geosynchronous orbit, the satellite's orbital period is exactly equal to the Earth's rotational period, but the satellite does not remain stationary over a fixed point on the Earth's surface. Instead, it follows a figure-eight pattern over the Earth's surface, with its position shifting east and west over time. Geosynchronous orbits are used for applications such as navigation and remote sensing.

So, the main difference between geostationary and geosynchronous orbits is that in a geostationary orbit, the satellite appears to remain stationary over a fixed point on the Earth's surface, while in a geosynchronous orbit, the satellite follows a figure-eight pattern over the Earth's surface.

A Sun-synchronous orbit is a type of polar orbit commonly used by Earth observation and remote sensing satellites. In a Sun-synchronous orbit, the satellite passes over any given point on the Earth's surface at the same local time of day, usually at a constant angle to the sun. This allows for consistent lighting conditions and minimizes the effects of shadows, making it ideal for imaging and monitoring applications.

To maintain a Sun-synchronous orbit, the satellite must have an inclination of approximately 98 degrees and an altitude between 600 and 800 kilometers. The orbit's precession is achieved by carefully selecting the satellite's altitude and inclination so that the effects of the Earth's oblateness and the gravitational pull of the sun and moon combine to create a slow rotation of the orbit's line of nodes, or the point where the orbit crosses the Earth's equatorial plane. This ensures that the satellite maintains the same solar angle at the same local time of day throughout the year.

Hohmann Transfer Velocity Calculation

In holman transfer for satellite id r1=10km and r2 = 20km then find velcity at parking orbit , velcity at appogee, pedigree, velcity at final orbit , and total velocity

To solve this problem, we can use the following equations for the velocities at different points in a Hohmann transfer:

Velocity at the initial orbit (Vi) = sqrt(mu / r1)Velocity at the final orbit (Vf) = sqrt(mu / r2)Velocity at the transfer orbit at periapsis (Vp) = sqrt(mu / (2 \* r1) \* ((r2 + r1) / r2))Velocity at the transfer orbit at apoapsis (Va) = sqrt(mu / (2 \* r2) \* ((r2 + r1) / r1))Total delta-v required (Δv) = |Vf - Vp| + |Va - Vi|

where:

mu is the gravitational parameter of the central body (usually a planet or a star)r1 is the radius of the initial parking orbitr2 is the radius of the final orbit

Plugging in the values given in the problem, we get:

Vi = sqrt(mu / r1) = sqrt(mu / 10 km)Vf = sqrt(mu / r2) = sqrt(mu / 20 km)Vp = sqrt(mu / (2 \* r1) \* ((r2 + r1) / r2)) = sqrt(mu / (2 \* 10 km) \* ((20 km + 10 km) / 20 km))Va = sqrt(mu / (2 \* r2) \* ((r2 + r1) / r1)) = sqrt(mu / (2 \* 20 km) \* ((20 km + 10 km) / 10 km))Δv = |Vf - Vp| + |Va - Vi|

We can simplify this by using the fact that Vp = Vi and Va = Vf (because the velocities are the same at periapsis and apoapsis in a Hohmann transfer):

Δv = |Vf - Vi| + |Vf - Vi| = 2|Vf - Vi|

Now we need to assume a value for mu, which depends on the mass of the central body. Let's assume mu = 3.986e14 m^3/s^2, which is the gravitational parameter of Earth. We can convert the radii to meters to get consistent units:

r1 = 10 km = 10,000 mr2 = 20 km = 20,000 m

Plugging in these values, we get:

Vi = sqrt(mu / r1) = sqrt(3.986e14 / 10,000) = 6328.3 m/s

Vf = sqrt(mu / r2) = sqrt(3.986e14 / 20,000) = 4472.9 m/s

Vp = sqrt(mu / (2 \* r1) \* ((r2 + r1) / r2)) = sqrt(3.986e14 / (2 \* 10,000) \* ((20,000 + 10,000) / 20,000)) = 8913.3 m/s

Va = sqrt(mu / (2 \* r2) \* ((r2 + r1) / r1)) = sqrt(3.986e14 / (2 \* 20,000) \* ((20,000 + 10,000) / 10,000)) = 3081.7 m/sΔv = 2|Vf - Vi| = 2|4472.9 - 6328.3| = 370

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