

Q4 A- Answer the following:

1. How can you calculate the spectral reflectance by radiance and irradiance method. Explain with equations.
2. Define geometric correction, what is the main purpose of doing it and what are its main conditions and stages?

B- Table below shows a digital image (3×5), it is required to apply low-pass filter (LPF) and high-pass filter (HPF) for the pixel (R₂, C₃), discuss how the DN's change for this image.

20	18	2	19	18
24	20	5	24	19
32	23	1	18	29

Q5 A- Answer the following:

1. Show the basic principles of GPS and GPR explaining their main uses.
2. Radar is active systems show its advantages and applications with respect to other remote sensing systems?
3. Define contrast, what are its types showing the equation for each one in case of neglecting atmospheric effect.

B- An area with 16 km ^{wide} ~~long~~ and 25 km ^{long} ~~wide~~ with mean elevation 300 m above mean sea level (M.S.L.), is to be surveyed along 5 flight lines to take an aerial photo with dimension 230 mm × 180 mm by a plane, its speed is 360 km/hr with camera focal length is 150 mm, photo scale 1/25 000 and the time between each successive two photos is 18 sec. Find :

1. The amount of longitudinal overlap and lateral overlap (sidelap).
2. The total number of theoretical and actual photos.
3. The area of each photo.

Q6 A- Answer the following:

1. Compare between TM and MSS.
2. Give the differences between Geoid and ellipsoid.
3. What is the nature of thermal path and how it differs with the nature of a body, explain it with equations.

B- A radar signal sent out by a GPR into two different media dry sand and wet clay. It is found their relative dielectric constants were 10.0 and 40.0 respectively and the electrical conductivity of the dry sand was 0.01 S/m. Find:

1. The reflection coefficient and its grade ;
2. The radar wave velocities in the two media ;
3. The depth of penetration.

Best Wishes.....