CEL748 Hydrologic Applications of Remote Sensing Technology

Postgraduate Course, Water Resources Engineering, Dept. of Civil Engineering, IIT Delhi
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Major Test — Full Marks: 40
II[nd] Semester, 2006-2007 — Time: 2 hrs.

Answer all questions

Assume following data whenever required:

$c = 3 \times 10^8$ m/s — $\mu_o = 4 \pi \times 10^{-7}$ H/m
$h = 6.6 \times 10^{-34}$ W s^2 — $\sigma = 5.67 \times 10^{-8}$ W m^{-2} K^{-4}
1 mile = 5280'

[1.] Distinguish followings: (10)

(i) Radiance and Irradiance
(ii) Metric and Interpretative photography
(iii) Sun-synchronous and Geostationary satellites
(iv) BIL and BSQ
(v) Surface Temperature and Brightness Temperature

[2.] **(a)** Write down Maxwell's Equations that define electromagnetic wave. Also define Stokes vector and state its significance. (8)

(b) The energy radiated by a grey body of 20 sq. m. having a temperature of 40 °C is 85% of the energy radiated by a perfectly square black body of side 2 m having a temperature of 45 °C. Calculate the emissivity of the grey body. Assume Stefan Boltzmann's constant equal to 5.67×10^{-8} Wm^{-2} K^{-4}. (5)

[3.] **(a)** What do you mean by followings: (6)

(i) Thermal Inertia — (ii) FCC
(iii) NDVI — (iv) Mosaic

(b) The distance on a map between two road intersections in flat terrain measures 5.03 inches. The distance between the same two points is 3.64 inches on a vertical photograph. If the scale of the map is 1:24000, what is the scale of the photograph? (4)

[4.] **(a)** Discuss some snow pack properties and describe how these are going to play role in snow cover monitoring in the alpine environment. (4)

(b) What is the basic principle behind the RESEP method for computing evapotranspiration using remote sensing data? (3)

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