
UNIVERSITI SAINS MALAYSIA

Peperiksaan Semester Kedua
Sidang Akademik 2005/2006
*Second Semester Examination
2005/2006 Academic Session*

April/Mei 2006
April/May 2006

ESA 482/3 – Rekabentuk Sistem Penderiaan Jauh
Remote Sensing Systems Design

Masa : [3 jam]
Hour : [3 hours]

ARAHAN KEPADA CALON :
INSTRUCTION TO CANDIDATES:

Sila pastikan bahawa kertas soalan ini mengandungi **LAPAN (8)** mukasurat dan **TUJUH (7)** soalan sebelum anda memulakan peperiksaan.

*Please ensure that this paper contains **EIGHT (8)** printed pages and **SEVEN (7)** questions before you begin examination.*

Jawab **LIMA (5)** soalan sahaja.

*Answer **FIVE (5)** the questions only.*

Jawab semua soalan dalam Bahasa Malaysia.

Answer all questions in Bahasa Malaysia.

Setiap soalan mestilah dimulakan pada mukasurat yang baru.

Each questions must begin from a new page.

1. (a) Bincang dengan jelas dua perhubungan penderiaan jauh sebagaimana yang di takrifkan oleh persamaan keseimbangan tenaga.

Describe the two important remote sensing relationships defined by the energy balance equation.

(6 markah/marks)

- (b) Tenaga sesuatu kuantum diberi sebagai $Q = hc/\lambda$. Bincang dengan jelas kepentingannya untuk pengimbas sistem penderiaan jauh.

Energy of a quantum is given as $Q = hc/\lambda$. Discuss clearly the significance of this property as it applies to remote scanning.

(7 markah/marks)

- (c) Apakah kepentingan Hukum enjakan Wien dalam penderiaan jauh.

What is the significance of Wien's Displacement Law as it applies to remote sensing?

(7 markah/marks)

2. (a) Apakah punca dan kesan serakan. Bincangkan kesan-kesan utama serakan kepada penderiaan jauh.

Describe the cause and effects of scattering. Describe the important consequences that scattering has on remote sensing.

(10 markah/marks)

- (b) Apakah punca dan kesan serapan. Bincangkan kesan-kesan utama serapan kepada rekabentuk penderia sistem penderiaan jauh.

Describe the cause and effects of scattering. Describe the important consequences that scattering has on the design of remote sensing sensors.

(10 markah/marks)

3. (a) Terangkan dengan jelas interaksi objek di permukaan bumi dengan tenaga elektromagnetik.

Discuss clearly the interactions of objects at the Earth's surface with the electromagnetic energy.

(10 markah/marks)

- (b) Berbantuan rajah-rajah, bincang dengan jelas mengenai lengkung ciri tanaman dan kepentingannya dalam penderiaan jauh.

With the aid of diagrams, discuss clearly about the vegetation characteristic curves and its importance in remote sensing.

(10 markah/marks)

4. (a) Nyatakan kelebihan dan kekurangan antara pengelasan diselia dan tak diselia.

Describe the advantages and disadvantages between supervised and unsupervised classification.

(6 markah/marks)

- (b) Dalam pengelasan imej penderiaan jauh, terdapat beberapa kesulitan dalam memisahkan beberapa kategori khususnya tanaman. Apakah puncanya? Bagaimana kita dapat mengatasi kesilapan tersebut? Bincangkan.

In the classification of a remotely sensed image, there were difficulties in separating several types of categories especially vegetation. What are the causes? Can we overcome the errors? Discuss.

(8 markah/marks)

- (c) Bincang dengan jelas kegunaan Pekali Kappa dalam menganggar ketepatan pengelasan data penderiaan jauh.

Discuss clearly the use of the Kappa Coefficient in estimating the classification's accuracy of a remotely sensed data.

(6 markah/marks)

5. (a) Bincang dengan jelas 3 data format yang lazim digunakan untuk data penderiaan jauh.

Discuss clearly the 3 data format commonly used for remotely sensed data.

(8 markah/marks)

- (b) Apakah yang dimaksudkan dengan komposit warna asli dan komposit warna palsu?

What is meant by true colour composites and false colour composites?

(6 markah/marks)

- (c) Bincang dengan jelas kaedah pemaparan imej data penderiaan jauh Landsat TM dengan sistem RGB sebuah computer.

Discuss clearly the method of displaying a Landsat TM image using a RGB display system in a computer.

(6 markah/marks)

6. (a) Nyatakan perbezaan sistem-sistem RBV, MSS dan TM yang terdapat pada satelit-satelit Landsat .

Describe the differences between the RBV, MSS and TM systems that available in the Landsat satellites.

(8 markah/marks)

- (b) Bincang dengan jelas kelebihan sistem off-nadir penderia HRV SPOT.

Discuss clearly the advantages of the HRV SPOT off nadir sensors.

(6 markah/marks)

- (c) Adakah kelebihan kebezajelasan ruang? Adakah ianya penting? Bincang.

Are the advantages of higher spatial resolution? Is it important? Discuss.

(6 markah/marks)

7. (a) Adakah orbit sesebuah satelit memainkan peranan yang penting dalam rekabentuk sesebuah satelit penderiaan jauh? Bincang.

Is the satellite's orbit play a big role in the design of a remote sensing satellite? Discuss.

(6 markah/marks)

- (b) Apakah orbit segerak matahari dan kenapa ia penting dalam pemetaan sumber bumi?

What is a sun-synchronous orbit and why is it important for land resource mapping?

(8 markah/marks)

- (c) Adakah orbit geo-tetap sesuai untuk penderiaan jauh? Bincang.

Is the geostationary orbit suitable for remote sensing? Discuss.

(6 markah/marks)

ooo000ooo