



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING
**UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING
(BSCE)**

ECE 2518: REMOTE SENSING

**SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: OCTOBER 2014
TIME ALLOWED: 2 HOURS**

Instructions to Candidates:

You should have the following for this examination

- Answer booklet

This paper consists of **FIVE** questions.

Answer question **ONE (COMPULSORY)** and any other **TWO** questions

All questions carry equal marks

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

Question One (COMPULSORY)

- a) State the definition of remote sensing and explain why it is important as a Geospatial data acquisition method. **(6 marks)**
- b) Explain the following terms as used in remote sensing
(i) Orbital Altitude
(ii) Field of view
(iii) Repeat cycle
(iv) Spatial resolution **(8 marks)**
- c) Using an appropriate diagram, outline the components of a remote sensing system **(7 marks)**
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- d) Define scale and outline TWO factors that determine the scale of an image. **(3 marks)**
- e) With the aid of a diagram, distinguish between the two main types of remote sensing systems as classified based on energy service. **(6 marks)**

Question Two

- a) Define the term ‘scattering’ as it applied to remote sensing and outline the types of scattering while citing any natural phenomena attributed to them. **(7 marks)**
- b) You are the manager of a water reservoir that supplies water to a major town. It is suspected that one of the reservoirs water sources has a high bio-matter content. Explain how you would use remote sensing to identify the culpable water source given your knowledge on energy matter interactions. **(8 marks)**
- c) Outline the advantages of aerial photography **(5 marks)**

Question Three

- a) Discuss the terms ‘Absorption Band’ and ‘Atmospheric Window’ and state their importance in Remote Sensing. **(5 marks)**
- b) Outline FOUR factors that influence the manner in which objects/features interact with incident radiation **(8 marks)**
- c) State the components of an Ideal Remote Sensing System **(3 marks)**
- d) Using appropriate examples, explain what you understand by the term ‘trade off’ as used in Remote Sensing. **(3 marks)**

Question Four

- a) With the aid of a diagram, outline the geometric properties of radar. **(8 marks)**
- b) Discuss types of film commonly used in film photographic systems, stating their areas of application. **(5 marks)**
- c) Outline the advantages of laser scanning. **(7 marks)**

Question Five

- a) Radar images are subject to severe geometric and radiometric distortions. Stating why this is the case, discuss THREE geometric distortions encountered in radar imagery. **(4 marks)**
- b) Distinguish between ‘reflectance’ and ‘radiance’ as the two terms apply to remote sensing. **(4 marks)**
- c) Outline the properties of Blackbody radiation and state why blackbody radiation is pertinent to remote sensing **(5 marks)**
- d) Explain the term ‘emissivity’ and state the factors influencing emissivity of an object. **(7 marks)**
- e) State the components of an idea remote sensing system. **(6 marks)**

