UNIVERSITY OF KWAZULU-NATAL

WESTVILLE/HOWARD COLLEGE CAMPUS

EXAMINATION: NOVEMBER 2011

SCHOOL: ENVIRONMENTAL SCIENCES
LEVEL: II
MODULE: GEOGRAPHIC INFORMATION SYSTEMS
CODE: ENVS211

DURATION: 3 HOURS **TOTAL MARKS: 300 (reduced to 100)**

INTERNAL EXAMINERS: **DR H WATSON**
MR N NGETAR
INTERNAL MODERATOR: **DR J ODINDI**

INSTRUCTIONS: SECTION A – ANSWER ALL QUESTIONS (100 marks)
SECTION B – ANSWER TWO QUESTIONS (200 marks)

SECTION A: COMPULSORY - ANSWER ALL QUESTIONS (100 marks)

1. Explain any six of the following:

    - Analogue data
    - Scale
    - Resolution
    - Pixel
    - Geodesy
    - Geostationary satellites
    - Spectral signature
    - Global Positioning System
    - Central meridian

    (30)

2. Define topology in GIS and discuss its importance, using examples. (20)

3. Define data accuracy and discuss four ways of describing spatial data accuracy. (25)

4. With the aid of a diagram, discuss the remote sensing process and the importance of wavelength in data capture. (25)

Total: 100 marks

SECTION B: ANSWER TWO QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS

1. Discuss the various sources of data in GIS. In your discussion, include their methods of input into GIS.

(100)

2. Explain the differences between spatial data, attributes and metadata.

(100)

3. Compare and contrast the advantages and disadvantages of vector and raster data models.

(100)

4. Define data accuracy and discuss the different sources of error in GIS, showing how they can be managed.

(100)

5. Select any application area of your choice and show how GIS is used. Include in your discussion, data capture, management, analysis and contribution to decision making.

(100)

Total 200 marks

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SECTION A: COMPULSORY - ANSWER ALL QUESTIONS (100 marks)

5. Explain any six of the following:
    - Topology
    - Ellipsoid
    - Cartesian coordinates
    - Geoid
    - Geographic coordinates
    - Datum
    - Adjacency
    - Network analysis
    - False colour (in remote sensing) (30)
6. Discuss **Four** types of vector overlay analysis. (20)
7. Define map projections and discuss any two types of maps projections used in South Africa. Include the advantages and disadvantages of each projection type. (30)
8. Discuss **Four** types of resolutions used in remote sensing and their importance in data capture. (20)

Total: 100 marks

SECTION B: ANSWER TWO QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS

6. Differentiate between vector and raster data models and discuss their advantages and disadvantages in GIS. Use sketched diagrams to illustrate your answer where necessary.

   (100)

7. Not all satellite images are clear enough for analysis. Discuss the various ways of enhancing satellite images before analysis.

   (100)

8. Discuss GIS as a spatial decision support system and show how it differs from other decision support systems.

   (100)

9. Select any application area of your choice and show how GIS is used. Include in your discussion, data capture, management, analysis and contribution to decision making.

   (100)

10. Differentiate between data quality and accuracy. Discuss the different ways of describing data accuracy in GIS. (100)

Total: 200 marks