



# THE CO-OPERATIVE UNIVERSITY OF KENYA

## SPECIAL / SUPPLEMENTARY EXAMINATION NOVEMBER-2024 EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN DISASTER RISK MANAGEMENT AND SUSTAINABLE DEVELOPMENT

UNIT CODE: BENT 4202

UNIT TITLE: GIS & RS II

DATE: NOVEMBER, 2024

TIME: 12:00 PM – 2:00 PM

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### INSTRUCTIONS:

- Answer question ONE (compulsory) and any other TWO questions

### QUESTION ONE

(a) Provide the full meaning of the following words

- WGS (1mark)
- GPS (1mark)
- UAV (1mark)

(b)

- List ANY three types of coordinate systems (3marks)
- Using a diagram, Identify the shape of the earth and Explain **TWO** theoretical proofs that the earth is not flat. (4marks)

(c) Explain TWO advantages of a GIS enabled questionnaire survey over the manual paper questionnaires. (4 marks)

(d) Draw the map of Africa and on it show the following geographic features.

- Congo basin (1/2 mark)
- L.Tanganyika (1/2 mark)
- Zanzibar (1/2 mark)
- Suez Canal (1/2 mark)

(e) Translate the following coordinates (deg, min,sec) into degrees

- $0^{\circ} 34'45''$  (2marks)
- $4^{\circ} 46'78''$  (2marks)

(f) Explain how satellites are used to monitor crop productivity and growth (4marks)

(g) Name the headquarters of the following global organizations

- FAO (1/2 mark)
- FIFA (1/2 mark)
- Google Inc. (1/2 mark)
- UNEP (1/2 mark)

(h) Calculate the scale of a map of Kenya fitted on a 15cm plane, given that the equivalent distance on the ground is 630km (assume this to be the Ugandan-Somali Borders). (4 marks)

## QUESTION TWO

- (a) Define the term electromagnetic spectrum (3marks)
- (b) With an illustration describe the different wavelengths and frequency bands of the sun's emitted energy? (9marks)
- (c) Using a simple illustration, outline the eight (8) stages/steps of remote sensing and GIS. (8 marks)

## QUESTION THREE

- (a) Explain the following terms giving an example as used in GIS
  - i. Georeferencing (4 marks)
  - ii. Resolution (4 marks)
- (b) Describe in detail, using illustrations of diagrams where possible, the process of buffering a road section (case study of 5m) in **ARCGIS** software. (12marks)

## QUESTION FOUR

### PRACTICAL (7 mins max)

### CHOOSE ONE OPTION FOR PRACTICAL

#### OPTION 1 (20 marks)

##### Instructions

See the attached excel data provided and use it to carry out the following exercise:

- i. Translate the data provided into a meaningful excel data (2marks)
- ii. Save the data in a spatially useful format (2marks)
- iii. Import the data into ARCGIS 10.6 Software (2marks)
- iv. Using the geospatial techniques learned, plot the coordinates on the plate (5marks)
- v. Translate the plotted coordinates to lines (8marks)
- vi. Describe the feature you have plotted. (1mark)

#### OPTION 2

##### Instructions

See the a georeferencing exercise as instructed bellow

- i. Download the Kenya constituency boundaries shapefile from any online source (2marks)
- ii. Download a JPEG image from Google earth showing the extent of your constituency.(2 marks)
- iii. By selecting at least three reference points, obtain a kml file from Google earth for georeferencing the image. (2 marks)
- iv. Import the relevant image and kml file into ArcGIS and undertake a georeferencing procedure as learned in class and save the file as a tiff image (10 marks)
- v. Upload the shapefile and clip the constituency of your interest (AOI) (3marks)
- vi. Clip the georeferenced raster file to show your AOI (3marks)