UNIVERSITY OF COLOMBO, SRI LANKA

FACULTY OF ARTS

THIRD YEAR END EXAMINATION IN ARTS (ONLINE), SEMESTER I – 2020/2021

GYG 3159: Introduction to GIS

Instructions to Students:

- The question paper starts on page 2.
- All written assessments must be **handwritten**. Handwriting must be **clear and readable**.
- Answers should be written on an **A4 size paper** (ruled/lined paper/or otherwise), using **a black ball point pen.**
- The **index number must be written on the top right-hand side** of each page of the answer script. Do not write your name anywhere on the answer script.
- **Number the pages** of the answer script using the following format at the **bottom of the page**: E.g., if it consists of 5 pages 1/5, 2/5…etc.
- Use the **common front page** (provided on LMS) as the first page of the answer script. You may print, or hand write the front page which must be the first page of your assessment.
- The **total number of pages** should be indicated on the front page of the answer script.
- **Scan/take photos of the answer script and convert it to a single PDF file** in the order of the page numbers.
- The full page of the answer script must be properly covered in the scanned image, and the scanned image must be clear/readable.
- LMS does not permit individual pages to be uploaded separately.
- **The only acceptable file format is PDF. The PDF file should be named with your index number**, e.g. A 12345
- Uploading answer scripts as JPEG/JPG or any other form will not be permitted.
- Complete and upload the final version of the answer script to LMS **within the stipulated 5 hours**
- Once the answer script has been uploaded to LMS, take **a screen shot of the full page** of the LMS with the word 'submitted', as an acknowledgement and keep it with you.
- **If** there is an **unexpected technical issue** with the uploading of an answer script to LMS, you may send your answer script via email to exam3@arts.cmb.ac.lk [Please insert the accurate email address according to the year] immediately.

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GYG 3159: Introduction to GIS

Duration: **5 hours** for completion and submission of answer scripts to LMS.

Answer 03 questions, selecting at least one question from each part.

All questions carry **equal marks**

Word limit for each question: Answer should not be exceeded 1,200 words.

Part -I

01.

(i). Explain with appropriate examples, the disadvantages of "Spatial Databases" compared to the "Aspatial Databases". (10 marks)

(ii). "The fundamental errors of Choropleth Maps have totally interlaced with their aspatial data". Examine this idea with suitable examples. (10 marks)

02.

(i). Discuss the key characteristics of "Raster Data Model", with appropriate diagrams. (10 marks)

(ii). "Raster Data Model is the most suitable spatial data model to represent the earth features". Do you agree with this idea? Critically examine this idea with appropriate examples. (10 marks)

03.

(i). Explain the differences between "Geographic Coordinate System/GCS" and "Projected Coordinate Systems/PCS" with suitable sketches. (10 marks)

(ii). "The Projected Coordinate System is more suitable to a country like Sri Lanka, for developing spatial databases". Discuss this idea with appropriate examples. (10 marks)

Part -II

04.

(i). You have been appointed as the **Land use planning officer** of the "X" DS division. The secretary of the DSD asked you to prepare a digital Land Use and Land Cover map (scale: 1:5,000) for the "X" DSD. You have been provided with the Google Earth Pro (satellite images), GND boundaries layer (in EPSG: 5234-Kandawala/Sri Lanka datum), and other hardware and software facilities. Explain all the steps that need to be followed to prepare a digital land use and land cover map in the QGIS environment. (13 marks)

(ii). Explain the advantages of making a digital Land use and land cover database in 1:5,000 scale and the disadvantages of more generalized Land use and land cover map. (07 marks)

05.

(i). "X" DS division has collected GPS locations and related data (e.g. depth, circumference, and owner etc.) of 50 active Gem mines. As the second task, the secretary of the DSD asked you to prepare a spatial database for Gem mines (in EPSG: 5234-Kandawala/Sri Lanka datum) and display Gem mines in the Google Earth Pro flatform. Explain all the steps that need to be followed in order to accomplish the above task in the QGIS environment**.** (13 marks)

(ii). Explain how to convert Gem mines spatial database in to the WGS 84 (EPSG- 4326) datum and how to obtain the new coordinate values of gem mines. (07 marks)

06.

(i). "X" DS division has identified that the areas which are located within 600 meters distance to rivers (to main rivers and tributaries) are vulnerable for flooding. As the third task, the secretary of the DSD asked you to identify all the GNDs which are vulnerable for flooding. You are provided with river networks and the GND boundaries of "X" DSD (in EPSG: 5234-Kandawala/Sri Lanka datum). Explain all the steps that need to be followed in order to accomplish the above task in the QGIS environment. (13 marks)

(ii). Explain how to calculate the vulnerable land areas (in Square Kilometres) of each and every GND and how to prepare the flood vulnerable areas map. (07 marks)

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