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# CHRISTIAN SERVICE UNIVERSITY COLLEGE
## KUMASI, GHANA
## FACULTY OF HUMANITIES
### DEPARTMENT OF PLANNING AND DEVELOPMENT
### BACHELOR OF ARTS IN PLANNING AND SOCIAL DEVELOPMENT
### END OF FIRST SEMESTER EXAMINATIONS – 2022/23 ACADEMIC YEAR

### LEVEL 300

## DPSD 313: GEOGRAPHIC INFORMATION SYSTEM

December, 2022          60 Marks       Time Allowed: 2 Hours: 30Minutes

## GENERAL INSTRUCTION TO CANDIDATES:

- The examination is in two parts (sections A & B).
- **Section A** contains *eighty (80)* multiple-choice questions. Each question carries equal marks. Candidates are required to answer all questions.
- **Section B** contains *four (4)* written questions. Candidates are required to answer Question *One (20marks)* which is compulsory and any other question *(10marks)* making two in all.
- Submit the Question Papers together with the Answer Booklet at the end of the examination. Failure to do so will attract sanction!

## Section A (Answer All Questions)

Use the following preamble to answer the next five questions. You are provided with five spatial analysis categories to match five spatial questions. Select the best answer that fit the questions. For example, what is the area of the Kumasi Sports Stadium? The best category to answer the question is "Measure size, shape, and distribution". Based on the above example answer Q1 to Q5.

1. Where are homes being sold at much higher prices than the prices of neighbouring homes?

a. Measure size, shape, and distribution
b. Determine how places are related
c. Find the best locations and paths
d. Detect and quantify patterns

2. What is the most cost-effective route for a delivery truck?

a. Determine how places are related
b. Detect and quantify patterns
c. Find the best locations and paths
d. Make predictions

3. Which parts of the traffic pattern are being affected by weather?

a. Understand where
b. Determine how places are related
c. Find the best locations and paths
d. Detect and quantify patterns

4. Where will the wildfire spread if the wind speed increases?

a. Determine how places are related
b. Detect and quantify patterns
c. Find the best locations and paths
d. Make predictions

5. Which animal habitats are closest to the lake?

a. Understand where
b. Determine how places are related
c. Find the best locations and paths
d. Detect and quantify patterns

6. A good GIS software requires the following i. user-friendliness ii. functionalities iii. compatibilities iv. updatability v. documentation and vi. cost-effectiveness.  a. True     b. False

7. Data capture functionality could either be the importing of digital data from a disk, network or database or digitizing it through the use of peripheral devices.   a. True     b. False

8. Data editing involves functions such as adding, duplicating and deleting spatial and attribute data as well as the creation and management of metadata.   a. True     b. False

9. A GIS is typically used to answer questions related to space.   a. True     b. False

10. Shapefiles has only three (3) extensions.       a. True      b. False

11. Attribute data is synonymous with spatial data.      a. True      b. False

12. Spatial data and tabular data are the two components of a geodatabase.      a. True      b. False

13. Metadata gives detailed information about the shapefile.      a. True      b. False

14. QGIS is the first commercial GIS software developed.      a. True      b. False

15. A city with a scale of 1:1500 is larger than a city with a scale of 1:15000.      a. True      b. False

16. All the following are True for GIS, except?
a. Can solve complex mathematical equations
b. Help solve spatial issues
c. Chart can be represented
d. Ability to reveal patterns and trends

17. ESRI has developed different product lines, which include all except one.
a. ArcGIS Pro
b. ArcGIS Survey 123
c. ArcGIS Online
d. ArcGIS CAD

18. The simplex definition given to metadata is?
a. Data that contain both spatial and tabular attributes
b. Data that contains information about a spatial data
c. Data that is made up of a topological feature
d. Data that disclose only information about the author

19. What defines a location on a 2D or 3D surface?
a. Projected Coordinate System
b. Geographic Coordinate System
c. Coordinate System
d. Planetary Coordinate System

20. Geographic Coordinate System measures location from?
a. Curved surface
b. Flat surface
c. Radial surface
d. Planar surface

21. Cartesian Coordinate System measure location from?
a. Curved surface
b. Flat surface
c. Radial surface
d. Planar surface

22. Spherical Coordinate System measure latitude and longitude in?

a. Degree Minutes Seconds

b. Feets

c. Military Reference System

d. UTM Zone 30N

23. Projected Coordinate System specify distances in the following units except?

a. Meters

b. Feets

c. Degree

d. Inches

24. Which of the following Coordinate Systems is suitable for calculating an area of a feature?

a. WGS 84

b. WGS 72

c. Decimal Degrees

d. UTM

25. The Equator divide the earth into two hemispheres namely?

a. Western and Eastern

b. Western and Southern

c. Eastern and Northern

d. Northern and Southern

26. The Prime Meridian divide the earth into two hemispheres namely?

a. Western and Eastern

b. Western and Southern

c. Eastern and Northern

d. Northern and Southern

27. Convert the location of Madina from 5°40'56.25"N and 0°10'12.50"W, to Degree Decimal?

a. 5.682292° and -0.170139°

b. 6.531562° and -0.548963°

c. 5.682292° and -0.170139°

d. 5.682390° and -0.171140°

28. Convert the location of Christian Service Unversity College, Kumasi from 6.670432°N and -1.646292°W to Degree Minutes Seconds?

a. 6°40'56.25"N and 1°10'12.50"W

b. 6°40'13.56"N and -1°38'46.65"W

c. 6°40'13" N and -1°38'46" W

d. 6°40'13.56"N and 1°38'46.65"W

29. Which of the following projection method is suitable for Africa
a. Cylindrical
b. Conic
c. Planar
d. Azimuthal

30. Which type of scale is best when reading distances on a map?
a. Representative Fraction
b. Lexical
c. Ratio
d. Linear

31. The following shows how places are related in space except for?
a. Distance
b. Point
c. Direction
d. Size

32. A map depicting layers such as regions with different shades of colours and settlements is termed?
a. Thematic map
b. Topographic map
c. Political map
d. Relief map

33. A choropleth map is a simple way to visualise a measure across a geographic area by displaying the range of variability through the use of colour. Which map type does this definition fall under?
a. Thematic map
b. Topographic map
c. Political map
d. Relief map

You are a GIS analyst for a consulting firm in Kumasi. Your boss won a contract to prepare a Structure Plan for five (5) major towns in the Kwadaso Municipal Assembly. For proper visualization, the Assembly asked you to work using a **scale of 1:2500** for each town and the exported maps should be printed on **A4 paper size**. Based on the preamble, answer the following questions (Q34 to Q38).

| | a. True | b. False |
|---|---|---|
| 34. The size of the five (5) towns is not the problem but rather the paper size. | a. True | b. False |
| 35. The scale of the maps is not a problem, but rather the paper size. | a. True | b. False |
| 36. The scale of the maps is not a problem, but rather the size of the towns. | a. True | b. False |
| 37. The scale does not correspond to the paper size. | a. True | b. False |
| 38. The size of the towns determines the scale to choose and the paper size. | a. True | b. False |

39. Bosomtwe District Assembly presented an old hardcopy map of the district to be reproduced in a digital format. The map contains features such as water bodies, mountains and valleys. As a GIS specialist, determine the type of map submitted to your outfit.

a. Thematic map

b. Topographic map

c. Political map

d. Physical map

40. In other to ascertain the nature of the land during construction, Engineers rely on one of the following map types.

a. Thematic map

b. Topographic map

c. Political map

d. Physical map

41. In other to ensure balance when preparing a map. The GIS technician needs to pay attention to the following. I. Size of the elements        II. Alignment of elements        III. Rule of thirds   IV. Page reference

a. I, III, IV

b. I, II, III

c. II, III, IV

d. I, III, IV

42. Which of the following is central and connects to all the map processes?

a. Medium

b. Audience

c. Purpose

d. Objective

43. A map that only gives information about the situation of things at the time it was produced can be termed?

a. Base map

b. Updated map

c. Spatial map

d. Situational map

44. Which is not considered map credit?

a. Date

b. Name

c. Map Number

d. Data

45. Which is considered the most important among the following?
a. Graticule
b. Title
c. Author
d. Legend

46. In other to measure the actual distance on a printed map, which is the most ideal scale to use?
a. Graphic scale
b. Statement scale
c. Ratio scale
d. Representative fraction scale

47. To determine the location of a feature on a good map, which element is most appropriate?
a. Map keys
b. Compass
c. Scale
d. Graticule

48. Mr Edusei is standing at the CSUC sports complex. He intends to give directions to a visitor (Mad. Lucy) coming to campus for the first time. The visitor alighted at Star junction which is about 350m from Santasi Roundabout. Which map element should be featured in directing the visitor to campus?
a. With respect to the reference point, use Whatsapp location
b. With respect to the reference point, use a ratio scale to reduce the area
c. With respect to the reference point, use the north arrow
d. With respect to the reference point, use google map

The following has to do with nomenclature. Use this statement to answer the questions (Q49 to Q53) whether True or False.

49. Procedures and Methods.                a. True        b. False

50. Hardware and Software.                  a. True        b. False

51. Spatial and Non-Spatial.                a. True        b. False

52. Remotely Sensed Image and Satellite Image.        a. True        b. False

53. Layer and Feature.                      a. True        b. False

This part of the test provides you with the 3 feature types in GIS. Use that to answer the questions below (Q54 to Q63). Which of these features is the best used to visualise the following?

54. Transport Network.
a. Line          b. Point          c. Polygon

55. Land Parcels.
a. Line          b. Point          c. Polygon

56. Crime Location.
a. Line          b. Point          c. Polygon

57. Forest Reserve.
a. Line          b. Point          c. Polygon

58. Residential Units.
a. Line          b. Point          c. Polygon

59. Airport.
a. Line          b. Point          c. Polygon

60. City with Scale 1:10000.
a. Line          b. Point          c. Polygon

61. River Channels.
a. Line          b. Point          c. Polygon

62. Bult-up.
a. Line          b. Point          c. Polygon

63. Topography.
a. Line          b. Point          c. Polygon

64. All but one is a shapefile file directory.
a. .shp          b. .dbf          c. .sbx          d. .shf

65. All the following can be true for the meaning of GIS, except?
a. Geography Information Service
b. Geospatial Information Systems
c. Geographic Information Science
d. Geographic Information Systems

66. You cannot do without the following component of GIS except?
a. Hardware
b. Data
c. Network
d. User

67. Which of the following is considered the most essential component of GIS?
a. Network
b. Method
c. Software
d. Data

68. The component that helps to connect many GIS Users across different platforms and has sharing capability is considered a?
a. Network
b. Software
c. People
d. Hardware

69. Which of the following is Web GIS? I. London Profiler II. ArcMap III. Earth Explorer IV. Google Earth V. Zoom Earth
a. I, II, IV, V
b. I, II, III, IV
c. I, III, IV, V
d. II, III, IV, V

70. Which type of scale is best when reading distances on a map?
a. Representative Fraction
b. Lexical
c. Ratio
d. Linear

Provide the full meaning of the following abbreviations;

71. GCS
a. Geographic Coordinate System
b. Ghana Coordinate System
c. Geography Coordinate System
d. Geospatial Coordinate Systems

72. PCS
a. Projected Coordinate System
b. Planar Coordinate System
c. Planetary Cartesian System
d. Projected Cartesian System

73. WGS
a. World Geographic Survey
b. World Geodetic Survey
c. World Geodetic System
d. World Geodesy System

74. UTM
a. Universal Tranverse Mecator
b. Universal Transverse Mercator
c. United Transport Machine
d. United Transverse Mercator

75. RMSE
a. Root Means System Error
b. Register Means Square Error
c. Reference Means Square Error
d. Root Means Square Error

76. DDM
a. Decimal Degrees Minutes
b. Degrees Display Minutes
c. Degrees Minutes Second
d. Degrees Decimal Minutes

77. USGS
a. United States Geographic Survey
b. United States Geological System
c. United States Geospatial System
d. United States Geological Survey

78. PDF
a. Printable Document Format
b. Portable Document File
c. Portable Document Format
d. Portable Document File

79. GPS
a. Global Positioning Survey
b. Global Positioning System
c. Geographic Positioning System
d. Geographic Positioning Survey

80. DEM
a. Digital Elevation Model
b. Derived Elevation Model
c. Derived Elevation Module
d. Digital Elevator Module

## Section B (Answer Question 1 and Any Other)

1. In this contemporary era, the use of digitiser for extracting information from a hardcopy map is outdated. From the hands-on experience garnered through the practical session of DPSD 313, outline the processes involved in creating/ digitising a feature from georeferenced data.

2. Use the preamble to answer the following question. As the GIS Technician recently hired for the Department of Planning and Development. The head of the department consulted you to provide appropriate information in setting up the State-of-the-Art GIS laboratory for the University.

   a. Discuss the 3 key components of GIS you will consider in the establishment of the laboratory.

   b. Describe the role of *Method* and *Users* in the establishment of the laboratory.

3. With appropriate illustrations, discuss the importance of the following GIS instruments:

   a. Plotter

   b. Scanner

   c. Handheld GPS

   d. Computer

4. Explain five (5) main elements of a good map.

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