End Semester Exam

27th Nov 2024

GS0.101 Spatial Thinking and Practice

Total Marks: 59

Time: 180minutes

Note: Make Suitable assumptions wherever needed and state it clearly when answering. No doubts will be clarified during the exams.

6x4=24

Part I. *Answer any Six of the following questions*

1. Remote sensing is a form of Surveying. Briefly argue why you agree or disagree.
2. The need and use of third dimension in Geospatial data is increasing tremendously. List and briefly state how you will get or derive the elevation and object surface heights for such needs.
3. Which type of affordances do you think will affect each of the following two use cases, when a path for movement across a city neighbourhood with a large park is considered?
   a. Travel by car
   b. Movement using a bicycle
4. You need to make a map that preserves the directionality for a region/country that has the following characteristics.
   a. Has almost 1500kms in N-S direction
   b. Has not more than 400kms in E-W direction
   Which projection surface will you prefer to use? Briefly support your answer.
5. Explain with figures the two types of determination of Latitudes. Which would you suggest is more appropriate to use?
6. There is a need to differentiate degraded lands (including salt affected) from good vegetative (or agricultural) lands. How do you think this can be achieved for a large state in India?
7. What is CORS? And how does that help in GNSS based surveying?

5x5=25

Part II. Answer **any Five** of the following questions

8. You wanted to compare the changes that have occurred spatially over a region and approached he authorities for the relevant Maps. They provided you with two paper maps – A map of 2020 where North is clearly marked upwards and a map of 2000 where the north is marked at some arbitrary direction (as the map was made with the bottom side of the paper being parallel to the Road from which there is access to this region). How will you ensure that the two maps can be overlayed on each other? Detail the steps. [Hint: state your assumptions clearly]
9. Based on the discussions in the class on the need of using Spatial and temporal data in assessing and improving Agricultural outcomes, how do you relate this to the spatial thought? Which approaches are being focussed in the agricultural domain?
10. A region of almost 2km by 4kms is going ot be developed as an IT city at the outskirts of an existing major city of India. It has a very undulating terraini. Both planimetric and levelling surveys have been carried out in this region. You need to represent the third dimension for use by (a) the planners/engineers and (b) the common (non-technical) user. Briefly describe your approaches for these two use cases.
11. What does one mean by 'Resolution' in remote sensing data? List and explain in a line, what each of these mean.

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12. How does a GNSS (GPS) work? Give two examples of operational GNSS systems and which country/region manages them.
13. There is a plan to survey the IIIT Hyderabad campus. Describe the Benchmarks and identify how you will set them up for a survey at a scale of 1:1000 (every meter needs to be surveyed.)

Part III. Answer the following question by detailing out your answers well 1x10=10

14. Discuss why projection systems are important in mapping? What are the different properties that a projection tries to preserve? Based on the choice of the (developable) Surface (or geometry), Cite two separate examples of how one type of projection system would be preferable over another, depending upon your projection goals.