Mid Semester Exam

23rd Sept 2024

GS0.101 Spatial Thinking and Practice

Time: 90minutes **Total Marks: 40**

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

Part I. Answer any **Eight** of the following questions 8x2=16

1. As observed, yesterday there was a total rainfall of 40mm over the day at IIIT Hyderabad campus. Which atomic elements of GIS or geospatial data has this captured?
2. (a) Convert the following whole circle bearings to reduced bearings:
   (i) 12°45′ (ii) 285°50′
   (b)Convert the following reduced bearings to whole circle bearings:
   (iii) SW 36°35 (iv) NW 85°10′
3. A study on road traffic, is able to get the data of AADT (average annual daily traffic) on each road segment. But has challenges in terms of using it for regulating traffic flow at each junction. What do you think is missing in this empirical data? How would you formulate the data collection for such a problem. [State briefly]
4. (a) A rectangular plot of land measures 30 cm × 40 cm on a cadastral map drawn on scale of 1: 5000. Calculate its area in hectares. (b) If a topographical sheet of the same area is compiled on scale of 1:50,000, what will be its area on the toposheet (or map)?
5. Mention 2 methods each for Direct and Indirect methods for distance measurements.
6. Map is a container of spatial data. Do you agree with this statement? Support your answer suitably.
7. For an area of 1000 sq km, a survey is planned using only angles. Will you carry out a compass survey or a theodolite survey? Explain briefly why.
8. (a) Surveying is the art of determining _____ positions of different features on the surface of the earth.
   (b) The first step of surveying is _____ survey.
9. In the field work you all did, how was the ranging done or distance measured? Briefly state if it has improved surveying accuracies?
10. An HT Electric tower is located within a densely forested region that is not accessible. But from a straight road, say marked with points A&B, there is a need to identify the shortest distance to it. How will you find point C on the line AB?

Part II. Answer **any four** of the following questions 4x4=16

11. In the example discussed in the class on Village land use map, what kind of spatial relations are observed between the locations of the habitat (houses), road network and paddy fields? How would you think the region will change if new, larger roads are constructed in this area? Which disciplinary thoughts will you employ in this study where you need to quantify the change (say in terms of area increase/decrease) and why?
12. The following fore and back bearings were observed in traversing with a compass where local attraction was suspected :

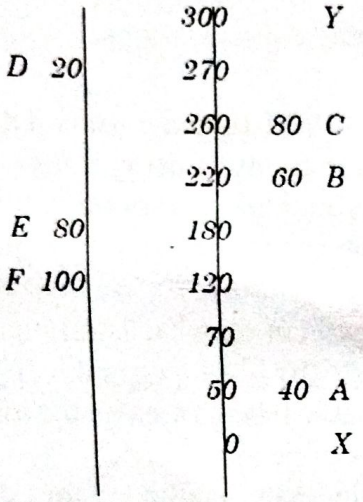
AB	65° 30′	245° 30′
CD	43° 45′	226° 30
BC	104° 15′	283° 0′
DA	326° 15	144° 45′

(a) Determine the corrected FB and BB

(b) Also get the True bearing of the lines assuming magnetic declination to be 5° 20′ W.

13. The field of geography uses metaphors to ~~under~~ understand the context and meaning of the word around us. Based on this, Buttimer identified four roles, or vocational meanings. List them and briefly state its meanings.

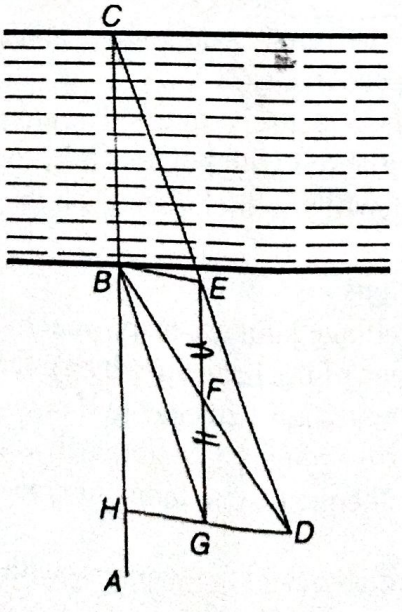
14. Sketch the following cross-staff survey of a field ABCDEF and calculate the area in hectares, assuming all measurements in metres.



Note: 0 is the start point of the survey line.

15. A survey line ABC crossing a river at right angles, cuts its banks at B and C. To determine width BC of the river, the following operation was carried out :

A line BE 60 m long was set out roughly parallel to the river. Line CE was extended to D and mid point F of DB was established. Then EF was extended to G such that FG = EF. And DG was extended to cut the survey line ABC at H. GH and HB were measured and found to be 40 m and 80 m respectively.



Part III. Answer the following question by detailing out your answers well 1x8=8

16. You are tasked with the survey of the following layout, an area bounded by stations A, B, C, D, E, with a chain and compass. Provide a step a step approach to how you will carry out this survey.

Note the following is observed based on Reconnaissance of the a rea –

a. The adjacent stations are intervisible.
b. Chaining between the stations is easy and without any obstruction.
c. Chain lines are as near the detail points as possible.
d. Chain lines connecting consecutive stations are as long as possible.

Hint: Use proper naming for each angle and distance, ~~but~~ and giving it a name like α_1, α_2, for angles and similarly for distances