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Total No. of Questions : 08

Total No. of Pages : 02

M.Tech. (Civil Engineering) (Sem.-3) REMOTE SENSING AND GIS FOR WATER RESOURCES AND ENVIRONMENTAL ENGINEERING Subject Code : MTCE -216

M.Code: 74765

## Date of Examination: 12-12-2022

Time: 3 Hrs.

Max. Marks : 100

## **INSTRUCTIONS TO CANDIDATES :**

- 1. Attempt any FIVE questions out of EIGHT questions.
- 2. Each question carries TWENTY marks.
- 1. (a) Define
  - (i) Active remote sensing
  - (ii) Rayleigh's scatter
  - (b) Two points A and B having elevations of 520m and 330m, respectively above datum appear on the vertical photograph having focal length of 21 cm and flying altitude of 2525 m above datum.

Their converted photographic co-ordinates are as follows:

| Point | Photographic coordinates |        |  |  |  |  |
|-------|--------------------------|--------|--|--|--|--|
|       | X (cm)                   | Y (cm) |  |  |  |  |
| А     | +2.62                    | +1.37  |  |  |  |  |
| В     | -1.98                    | +3.59  |  |  |  |  |

Determine the length of the ground line AB.

- 2. An area 30 km long in the north south direction and 24 km in the east west direction is to be photographed with a lens having 30 cm focal length for the purpose of constructing a mosaic. The photograph size is 20 cm x 20 cm. The average scale is to be 1:12000 effective at an elevation of 400 m above the datum. Overlap has to be at least 60% and side lap at least 30%. An intervalometer will be used to control the interval between the exposures. The ground speed of the aircraft will be maintained at 200 km/hour. The flight lines are to be laid in the north south direction on an existing map having a scale of 1:60000. The two outer flight lines are to be coincided with the east and west boundaries of the area. Determine the data for the flight plan.
- 3. What is the difference between air-borne and space borne radars? Explain with diagrams.

- 4. Name any five software packages in use for GIS. Explain the detailed applications of **any TWO** of them. Typical case study can also be included.
- 5. (a) How you will analyze digital terrain modeling by Rosters and Vectors approach.
  - (b) Is it possible to analyze Pre or Post flood with the help of Remote Sensing and GIS technology? Explain.
- 6. Differentiate between Kinematic and Differential GPS. Name various errors associated with GPS. Explain in detail applications of GPS.
- 7. What are the advantages of supervised image classification over the unsupervised image classification? List three important properties of an image.
- 8. Discuss the following with reference to remote sensing/GIS/GPS:
  - (a) Application of rainfall-runoff modeling.
  - (b) Irrigation management.

## NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.