

**B.TECH**  
**(SEM VI) THEORY EXAMINATION 2022-23**  
**GIS & REMOTE SENSING**

*Time: 3 Hours*

*Total Marks: 100*

**Note:** Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

**1. Attempt all questions in brief. 2 x 10 = 20**

- a. List out the various elements of remote sensing.
- b. Describe the working principle of remote sensing.
- c. Explain the role of Sensors in Remote Sensing?
- d. State the various types of platforms available for Remote Sensing.
- e. Explain the term stereoscopy?
- f. State the fundamental steps involved in Digital Image Processing.
- g. Describe the application of microwave remote sensing in Defence system.
- h. State the reason which makes microwave remote sensing as all-weather technique.
- i. Explain the term TIN elevation model.
- j. State the use of 'clip' tool in GIS operation.

**SECTION B**

**2. Attempt any three of the following: 10x3=30**

- a. Explain the process of energy interaction with earth surface feature and state the general energy balance equation.
- b. A line AB, 3000 m long, lying at an elevation of 600 m measures 10 cm on a vertical photograph for which focal length is 20 cm. Determine the scale of the photograph in an area the average elevation of which is about 900m.
- c. Describe the term stereoscopic parallax and state the process to calculate height of object using stereoscopic parallax.
- d. Explain the UTM geographic coordinate system.
- e. Describe the various methods of data input for a GIS.

**SECTION C**

**3. Attempt any one part of the following: 10x1=10**

- a. Describe the fundamental of electromagnetic spectrum and label the various types of electromagnetic radiations with help of a neat sketch.
- b. Illustrate the significant observations from spectral reflectance curve of vegetation & water using a neat sketch.

**4. Attempt any one part of the following: 10x1=10**

- a. Describe the following terms by labelling them on a neat sketch of aerial photograph:  
(i) Angle of Tilt (ii) Photo Principal Point (iii) Photo Nadir point (iv) Principal Plane  
(v) Horizon Point
- b. The scale of an aerial photograph is 1 cm = 150 m. The photograph size is 30cm x 30cm. If the longitudinal lap is 65% and side lap is 25%, calculate the number of photographs required to cover an area of  
(i) 100 km<sup>2</sup>  
(ii) 10 km x 10 km

**5. Attempt any one part of the following: 10x1=10**

- a. Differentiate Push broom & Whisk broom technique of data recording by a sensor.
- b. Explain the fundamental of Image Classification and illustrate the process of supervised & unsupervised classification.

**6. Attempt any one part of the following: 10x1=10**

- a. Describe the important bands of microwave remote sensing stating their applications and wavelength ranges.
- b. Explain the procedure of map projection and three principal map projection techniques.

**7. Attempt any one part of the following: 10x1=10**

- a. Explain the various types of spatial data models along with their advantages & disadvantages.
- b. Describe the process of map overlay along with any 2 tools which can be used for it.