

**M. Sc. 2<sup>nd</sup> Semester Examination, 2021**

**GEO-INFORMATICS**

**[Thermal, Microwave Remote Sensing and Application]**

**Course Code: GI 203T**

**Course ID: 23153**

**Time: 2 Hrs.**

**Full Marks: 40**

*The figures in the margin indicate full marks*

*Candidates are require to give their answers in their own words as far as practicable*

*All questions are of equal marks*

*Answer any **four** questions selecting at least one from each unit*

**Unit-1: Concept of thermal energy**

1. Explain the concept and purpose of thermal remote sensing with suitable examples. Which wavelengths of electro-magnetic spectrum are used for thermal remote sensing? Explain the principle of black body radiation. 6+1+3=10
2. Write a brief note on TIR scanners. Explain two major application of thermal remote sensing which are not addressed by optical remote sensing 4+6=10

**Unit-2: Basic of Microwave Remote Sensing (RS)**

3. How do we convert slant range image into ground range image? Explain the characteristics of SAR image based on polarisation and dialectic property. How the geometric distortion changes from near range to far range? 4+5+1=10
4. Estimate range resolution of a SAR image where transmitted pulse width is 30  $\mu$ S. Explain three application of RADAR remote sensing. 4+6=10

**Unit-3: Processing of thermal and microwave image**

5. Briefly discuss the characteristics of major earth surface features (buildings, waterbodies, bare soil, forest) in daytime and night time thermal images. Write down the major differences between optical and thermal remote sensing in term of their advantages and limitation. 6+4=10
6. Explain the nature of interaction between microwaves and earth surface features. How does dielectric constant of a material determine its backscatter coefficient? Explain with examples. How the image appearance changes with the change of wave length in the SAR image. 4+2+2+2=10

.....