R									

UNIVERSITY OF PETROLEUM & ENERGY STUDIES
(P.O. Bidholi, via Premnagar, Dehradun Pin: 248 006)

End-semester Examination-April 2017 | **Max. Marks: 100**
Name of the Program: B. Tech (*Geoinformatics Engineering*) | **Semester – VII**
Course Title: Advance Remote Sensing (Elective) | **Code: GIEG 422**
This question paper has 2 (*two*) pages | **Duration: 3 hours**

Note: Include appropriate Question Number. Do not split answers on largely separated answer sheets. Overwriting, striking-off answers, illegible answer or any kinds of incorrect scribbling will not attract evaluation. Use pencil while drawing figures and other forms of charts.

SECTION: A

Questions from 1 to 10 carry 2 (*two*) marks each. Answer all of them? (10 × 02 = 20)

1. What is microwave polarization?

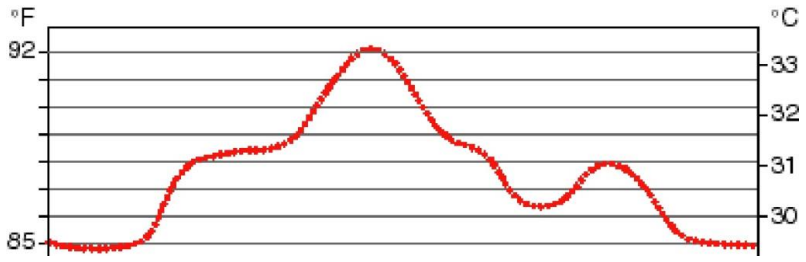
2. Statement: The land surface appears smooth to a long wavelength radar. Little radiation is backscattered from the surface. True/ False? Comment on short wavelength radar?

3. Statement: High resolution sensors like IKONS and/or Orbview3 apply 'Pushbroom' principle? True/ False? What is *Pushbroom* principle?

4. $$P_r = \frac{G^2 \lambda^2 P_t \sigma}{(4\pi)^3 R^4}$$ In the adjacent radar equation, identify any 4-parameters?

5. Comment on the relationship between vegetation cover and Land Surface Temperatures?

6. Identify governing factors for Heat Island Effect? Identify land use/land cover for the temperatures identified on a mid-afternoon day in the following temperature profile?



7. What are the differences between multi-spectral and hyperspectral remote sensing?

8. Identify and show terrain induced distortions in microwave remote sensing?

9. Text: Quote "First approach is counting the number of breaking ships on each acquisition day by time-series ALOS imagery. In the previous research study, it was found that ALOS imagery can classify vessels structure into categorized vessels. Several methods were used for extracting ships on ALOS imagery. More specifically, vessel figure were filtered by using spatial search function of GIS" Unquote.
How do you suggest categorization of vessels on ALOS imagery using spatial search function?

10. If wavelength of 3.66 µm - 3.84 µm is suitable for sea surface temperature in MODIS, what could be the role of 8.40 µm – 8.70 µm?

SECTION: B

Questions from 11 to 18 carry 5 (*five*) marks each. Answer all of them? (08 × 05 = 40)

11. What are slant resolution and azimuth resolution?

12. Briefly explain applications of Microwave Remote Sensing?

13. Why do you prefer Hyperspectral Remote Sensing in Hydrocarbon Exploration?

14. Critique on the limitations of UAVs for monitoring pipelines?

15. Which remote sensing techniques are suitable for Rare Earth Element Deposit Exploration?

16. How Soil salinity may be determined using remote sensing techniques?

17. Between Fixed-wing UAV and Rotary UAV, which should be suitable for pipeline monitoring?

18. Comment on reducing Urban Heat Island effect?

SECTION: C

Questions from 19 to 22 carry 10 (*ten*) marks each. Answer all of them? (04 × 10 = 40)

19. a) What are spectral libraries?
    b) How spectral libraries are helpful in mining industry? (4+6)

20. a) Identify unique capabilities of UAV based remote sensing?
    b) What are the limitations of radar images in terms of visual interpretation? (4+6)

21. a) How Ultramafic rocks, Metavolcanics, Gabbros, Granites and Alteration zones behave in hyperspectral remote sensing?
    b) Given option, which remote sensing do you prefer in Uranium deposit mapping? Justify? (4+6)

22. a) What are thermal remote sensing applications?
    b) How thermal remote sensing is useful in agriculture health monitoring? (4+6)