JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MOOC End Term Examination- 2025

B.Tech-VII Semester

COURSE CODE (CREDITS): 20B2WCE607 (3) MAX. MARKS: 70

COURSE NAME: REMOTE SENSING: PRINCIPLES AND APPLICATIONS

COURSE INSTRUCTORS: AKASH BHARDWAJ MAX. TIME: 3 Hours

Note: *(a) All questions are compulsory.*

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	Marks
Q1 (a)	Explain the difference between geostationary orbit and sun-synchronous orbit with suitable diagrams and their applications.	5
Q1 (b)	A satellite sensor has the following specifications: • Spatial resolution: 30 m • Spectral resolution: Visible, SWIR and NIR • Swath width: 100 km • Temporal resolution: 15 days Discuss the suitability of this sensor in terms of its characteristics and possible applications in remote sensing.	5
Q2 (a)	How can tone and colour help differentiate between urban and water features in a false color composite image?	4
Q2 (b)	Describe Rayleigh, Mie and non-selective scattering mechanisms with examples.	4
Q2 (c)	Compare active and passive remote sensing systems in terms of energy source, operational limitations and advantages.	6
Q3 (a)	What is NDVI? Explain how it represents vegetation conditions. A region shows a sudden NDVI drop from 0.65 to 0.10 after one year. What could be the possible reasons?	6
Q3 (b)	You observe a rectangular feature with sharp boundaries, uniform tone, and adjacent road networks. Which keys of interpretation help classify it as an industrial facility? Explain in detail.	5
Q4 (a)	Compare the response of smooth water surfaces and urban buildings in SAR images. Why do they appear contrasting?	4
Q4 (b)	Design a simple rule-based classification system using visible + NIR reflectance to separate: • Water • Soil • Healthy vegetation • Snow	5
Q5 (a)	Describe how satellite geometry influences Position Dilution of Precision (PDOP) with suitable figure.	5

Q5 (b)	Explain three main segments of the GPS system and briefly describe each.	5
Q6 (a)	A city planning department wants to map roads, land parcels and streetlights. Identify the appropriate data representation for each feature.	5
Q6 (b)	Choose the most suitable data format (raster/vector) for the following applications and justify your choice: • Flood hazard zoning • Road navigation mapping • Digital elevation modelling • Soil type classification	6
Q6 (c)	Describe the major classification approaches used in LULC mapping.	5