NPTEL Online Certification Courses

Indian Institute of Technology Kharagpur

MACHINE LEARNING FOR SOIL AND CROP MANAGEMENT

Assignment- Week 9

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 15 **Total mark: 15 X 1 = 15**

QUESTION 1:

_____ is composed of about 100 to 200 spectral bands of relatively narrow bandwidths (5-10 nm)

a. Hyperspectral data
b. Multispectral data
c. Optical data
d. None of the above

Correct Answer: a

Detailed Solution: Hyperspectral data is composed of about 100 to 200 spectral bands of relatively narrow bandwidths (5-10 nm).

QUESTION 2:

Landsat and MODIS are the example of _____ satellite/sensor,

a. Multispectral
b. Hyperspectral
c. Ultraspectral
d. All of these

Correct Answer: a

Detailed Solution: Multispectral imagery is taken by popular satellite/sensors such as Landsat and MODIS.

QUESTION 3:

The visible wavelength range is typically considered to be between _____ micrometers (µm).

a. 0.28 -0.35
b. 0.35-0.7
c. 0.7-1
d. 1-2.5

Correct Answer: b

Detailed Solution: The visible wavelength range is typically considered to be between 0.35-0.7 micrometers (µm).

QUESTION 4:

_____ was indeed a pioneering hyperspectral imager. It was a key instrument aboard NASA's Earth Observing-1 satellite, launched in 2000.

a. EO-1 Hyperion
b. Landsat
c. Sentinnel-1
d. None of the above

Correct Answer: a

Detailed Solution: The EO-1 Hyperion was indeed a pioneering hyperspectral imager. It was a key instrument aboard NASA's Earth Observing-1 satellite, launched in 2000.

QUESTION 5:

The primary mission of ECOSTRESS is to measure the temperature of _____heating up

a. Plant
b. Soil
c. Water
d. All of the above

Correct Answer: a

Detailed Solution: The primary mission of ECOSTRESS is to measure the temperature of plant heating up

QUESTION 6:

AVIRIS sensor covered the _____ spectrum region.

a. Visible only (VIS)
b. Near Infrared only (NIR)
c. Short-wave infrared only (SWIR)
d. VIS-NIR-SWIR

Correct Answer: d

Detailed Solution: AVIRIS sensor covered the complete VIS-NIR-SWIR spectrum region.

QUESTION 7:

_____allow us to visualize wavelengths that the human eye can not see (i.e. NIR). Using bands such as NIR increases the spectral separation and often increases the interpretability of the data.

a. True Colour Composite
b. False Colour Composite
c. Panchromatic
d. None of the above

Correct Answer: b

Detailed Solution: False Colour Composite allow us to visualize wavelengths that the human eye can not see (i.e. NIR). Using bands such as NIR increases the spectral separation and often increases the interpretability of the data.

QUESTION 8:

COral Reef Airborne Laboratory: An airborne mission flown using the _____ to evaluate health and conditions of coral reef ecosystems

a. AVIRIS
b. AVIRIS-NG
c. Portable Remote Imaging Spectrometer (PRISM)
d. None of the above

Correct Answer: c

Detailed Solution: COral Reef Airborne Laboratory: An airborne mission flown using the Portable Remote Imaging Spectrometer (PRISM) compatible with a wide range of piloted and Uninhabited Aerial Vehicle (UAV) platforms to evaluate health and conditions of coral reef ecosystems

QUESTION 9:

The Indian Space Research Organisation (ISRO) launched the Indian Hyperspectral Imaging Satellite (HySIS) from Sriharikota on _____

a. 2015
b. 2018
c. 2008
d. 2003

Correct Answer: b

Detailed Solution: The Indian Space Research Organisation (ISRO) launched the first Indian Hyperspectral Imaging Satellite (HySIS) from Sriharikota on 29 November 2018.

QUESTION 10:

What is/are the challenge(s) in hyperspectral remote sensing field?

a. Lower signal-to-noise ratio (SNR) induced by the short dwell time of data acquisition over a given pixel.

b. Uncontrolled illumination conditions of the source and objects.

c. Atmospheric attenuation of gases and aerosol particles.

d. All of these

Correct Answer: d

Detailed Solution: All the above-mentioned statements marked as options are the major challenges in hyperspectral remote sensing field.

QUESTION 11:

Push broom scanners, also sometimes referred to as _____ track scanners.

a. along

b. behind

c. across

d. over

Correct Answer: a

Detailed Solution: Push broom scanners, also sometimes referred to as along track scanners, use a line of detectors arranged perpendicular to the flight direction of the spacecraft

QUESTION 12:

_____ is the upwelling radiation from the Earth to the sensor.

a. Rayleigh scattering

b. Radiance

c. Absorbance

d. Transmittance

Correct Answer: b

Detailed Solution: Radiance is the upwelling radiation from the Earth to the sensor whereas Irradiance is the downwelling radiation from the sun.

QUESTION 13:

The _____ is a region in the red-NIR transition zone of vegetation reflectance spectrum

a. Atmospheric window
b. Red edge
c. B2
d. None of the above

Correct Answer: b

Detailed Solution: The red edge is a region in the red-NIR transition zone of vegetation reflectance spectrum and marks the boundary between absorption by chlorophyll in the red visible region, and scattering due to leaf internal structure in the NIR region.

QUESTION 14:

Common unsupervised clustering methods are

a. K-means clustering
b. Hierarchical clustering
c. DBSCAN
d. All of the above

Correct Answer: d

Detailed Solution: Unsupervised clustering methods are a type of machine learning algorithm used to group data points into clusters based on their similarity, without the need for labeled

data. Common unsupervised clustering methods are K-means clustering, Hierarchical clustering, DBSCAN etc.

QUESTION 15:

The _____ is where the leaf cell structure produces a strong reflection.

a. Red
b. Blue
c. NIR
d. None of the above

Correct Answer: c

Detailed Solution: The NIR is where the leaf cell structure produces a strong reflection.