



Applied Remote Sensing Training (ARSET) Program

Humanitarian Applications Using NASA Earth Observations

Homework Questions

Question 1

SAR sensors send a radar signal that illuminates a target area from a slant range angle.

Answers: (bold correct)

- a. **True**
- b. False

Question 2

Which of the following measurements are used for Interferometric SAR (InSAR) to detect changes in topography and structures?

Answers: (bold correct)

- a. Amplitude
- b. **Phase**
- c. Polarization

Question 3

Coherence between two phase signals is measured from:

Answers: (bold correct)

- a. **-1 to 1**

- b. **0 to 1**
- c. 0 to 100

Question 4

To capture a decrease in coherence related to a conflict event, how many SAR images are required to make two InSAR pairs?

Answers: (bold correct)

- a. 2
- b. 3
- c. 4
- d. None of the above

Question 5

When selecting data from ASF Vertex, which of the following file types contains the phase information needed to perform InSAR analysis?

Answers: (bold correct)

- a. L1 Ground Range Detected High-Resolution Dual-Polarization (GRD-HD)
- b. L1 Ground Range Detected Mid-Resolution Dual-Polarization (GRD-MD)
- c. **L1 Single Look Complex (SLC)**
- d. L0 Raw Data (RAW)

Question 6

According to the Office of the United Nations High Commissioner for Refugees (UNHCR), since 2010, the global forcibly displaced population has doubled.

Answers: (bold correct)

- a. True
- b. False

Question 7

Which of the following are benefits of satellite remote sensing data for monitoring humanitarian conditions at refugee settlements?

Answers: (bold correct)

- a. Satellites are not inhibited by the limited physical access to or remote locations that typify many refugee settlements.
- b. Broad geographic coverage by satellites means that we can contextualize refugee settlements within the surrounding region or hosting country.
- c. Satellite-derived information on environmental and climatic conditions in and around refugee settlements help to localize insights on refugee livelihoods, sustainable development, disaster risk reduction, and climate adaptation.
- d. **All of the above**

Question 8

Which of the following is a remote sensing time series detection algorithm, shown in the training, built for identifying disturbances by accounting for long term trends as well as seasonal trends?

Answers: (bold correct)

- a. Landsat-based detection of Trends in Disturbance and Recovery (LandTrendr)
- b. **Breaks for Additive Seasonal and Trend (BFAST)**
- c. Software for the Processing and Interpretation of Remotely sensed Image Time Series (SPIRITS)'

Question 9

The timing, magnitude, and spatial extent of changes mapped through time series analysis allow the following:

Answers: (bold correct)

- a. Hint at population dynamics within a refugee settlement
- b. Provide greater cadence in reporting proxy refugee populations
- c. Provide consistent and timely observations for data collection and the scale of the analysis
- d. **All of the above**

Question 10

Across the satellite-informed population datasets shown in the training, what is the main reason that they are inconsistent with recorded population data?

Answers: (bold correct)

- a. National census data do not include refugee populations
- b. The population datasets were based on satellite data collected before refugee arrivals
- c. Built-up products tend to underestimate refugee settlement areas**
- d. Refugee settlements are too small to be detected by the satellite data used in modeling population

Question 11

The United Nations High Commissioner for Refugees (UNHCR) shelters nearly a third of global refugees in settlements.

Answers: (bold correct)

- a. True**
- b. False

Question 12

Which of the following are challenges with UNHCR planning at refugee settlements:

Answers: (bold correct)

- a. Ensuring sufficient space for refugee shelter and agriculture
- b. Efficiently distributing aid
- c. Mitigating environmental degradation
- d. All of the above**

Question 13

Which of the following is not an existing remote sensing-derived settlement dataset?

Answers: (bold correct)

- a. Global Human Settlement Layer (GHSL)
- b. Global Population with Refugee Settlements (GPRS)**
- c. World Settlement Footprint (WSF)
- d. Geo-Referenced Infrastructure and Demographic Data for Development (GRID3)

Question 14

What type of unsupervised classifier was used to estimate functional refugee settlement boundaries?

Answers: (bold correct)

- a. Random Forest
- b. ISODATA
- c. Maximum Likelihood
- d. K-means**

Question 15

For the Pagirinya case study, what indicator was used to assess land degradation at the refugee settlement?

Answers: (bold correct)

- a. Leaf Area Index (LAI)
- b. Fraction of Absorbed Photosynthetically Active Radiation (FAPAR)
- c. Net Primary Productivity (NPP)**
- d. Plant Area Index (PAI)

Question 16

The establishment and growth of a refugee camp can create new hazards.

Answers: (bold correct)

- a. True**

- b. False

Question 17

What variable was not included in the climate index measured at Cox's Bazar?

Answers: (bold correct)

- a. Slope
- b. Elevation**
- c. Temperature Anomaly
- d. Change in Annual Precipitation Accumulation
- e. All of the above were included in the index

Question 18

What's another way to describe winsorization?

Answers: (bold correct)

- a. Interpolation
- b. Averaging
- c. Data compression
- d. Outlier removal**

Question 19

The climate exposure index was highest at which refugee camp in Cox's Bazar?

Answers: (bold correct)

- a. Kutupalong
- b. Camp 19
- c. Camp 4 Extension**
- d. Camp 15

Question 20

The vulnerability of refugees to climate hazards affecting a refugee camp is compounded by which of the following?

Answers: (bold correct)

- a. Societal marginalization
- b. Limited livelihood options
- c. Restrictive refugee policies
- d. All of the above**