Co-funded by the
Erasmus+ Programme
of the European Union

Co-funded by the
Erasmus+ Programme
of the European Union

DEVELOPMENT OF A TRAINING PROGRAM FOR ENHANCING THE USE OF ICT TOOLS IN THE IMPLEMENTATION OF PRECISION AGRICULTURE

2018-1-ES01-KA202-050709

T.P.3 Evaluation for students

Authors: Vasilis Psiroukis, Spyros Fountas

Date: 31-10-2019

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Question 1

a. Remote Sensing allows us to measure certain attributes of an object or an area without direct contact with the object itself.
b. Remote Sensing allows us to measure certain attributes of an object or an area using laboratory methods.
c. Remote Sensing allows us to measure certain attributes of an object or an area with real time data collection.
d. Remote Sensing allows us to measure certain attributes of an object or an area using normal machinery.
   Correct: a

Question 2

a. Excess phytochemicals end up in aquifers without environmental impact due to the small amounts of preparations that are used in modern agriculture.
b. Excess phytochemicals are stored in the soil and so changes can be made in the application of preparations between cultivation periods.
c. Excess phytochemicals and fertilizers end up in aquifers, resulting in water pollution, while some of active substances remain in the soil, creating toxicity.
d. Excess phytochemicals have positive effects on crops, as they better protect susceptible plants from biotic and abiotic enemies.
   Correct: c

Question 3

a. Remote sensing is based on the electrostatic pressure.
b. Remote sensing is based on the electromagnetic spectrum.
c. Remote sensing is based on the dynamics of soil types.
d. Remote sensing is based on neutron radiation.
   Correct: b

Question 4

a. Vegetation indices are functions between visible and infrared spectrum.
b. Vegetation indices are functions between visible and ultraviolet spectrum.
c. Vegetation indices are functions between ultraviolet and infrared spectrum.
d. Vegetation indices are functions between visible and gamma ray spectrum.
   Correct: a

Question 5

a. The main advantage of GIS over simple maps is that the data interact with other data after user command.

b. The main advantage of GIS over simple maps is that the data interact with other computers after user command.
c. The main advantage of GIS over simple maps is that the data interact with the maps after user command.
d. GIS does not have any advantage over simple maps, but they are more user-friendly.
Correct: c

Question 6
a. Sensor data must have certain features in order to be analyzed in a GIS environment. Most importantly, the data must be georeferenced.
b. Sensor data must have certain features in order to be analyzed in a GIS environment. Most importantly, the data must be highly accurate.
c. Sensor data must have certain features in order to be analyzed in a GIS environment. Most importantly, the data must be related to agricultural production.
d. GIS software does not have a problem with recognizing and reading data from various sources, different structures and forms, and basically can open anything.
Correct: a

Question 7
a. Soil is a good electrical conductor, and especially sandy soils.
b. Soil is a good electrical conductor, and especially clay soils.
c. Soil is a good electrical conductor, and especially well drained soils.
d. Soil is a bad electrical conductor, and especially clay soils.
Correct: b

Question 8
a. Estimations of soil texture can only be made by soil analysis.
b. Estimations of soil texture can only be made based on the soil's ability to produce high quality yield.
c. Estimations of soil texture can be made based on the soil's ability to produce high final yield.
d. Estimations of soil texture can be made based on the soil's ability to conduct electricity.
Correct: d

Question 9
a. Electrical conductivity is considered to be the most critical soil parameter for the delineation of agricultural parcels into management zones.

b. Electrical conductivity is not a particularly critical parameter for the segregation of agricultural parcels into management zones, but rather more with the application of variable fertilizer dosages.
c. Electrical conductivity indicates the correlation between soil parameters and yield production.
d. b) and c)
Correct: a

Question 10
a. By having information on the soil electrical conductivity, we can estimate the salinity level and porosity of the soil, thermal capacity and soil structure.
b. By having information on the soil electrical conductivity, we can estimate the soil texture and soil water retention.
c. By having information on the soil electrical conductivity, we can estimate the soil organic matter and Cation exchange capacity.
d. All the above.
Correct: d

Question 11
a. Yield variability is usually insignificant in most agricultural units.
b. Yield variability is usually low but it is found in all agricultural parcels.
c. Yield variability is usually non-existent in most agricultural units.
d. Yield variability is usually high in almost every agricultural parcel.
Correct: d

Question 12
a. Mapping of soil electrical conductivity has not been implemented due to expensive equipment.
b. Mapping of soil electrical conductivity has not been implemented because there is no suitable equipment.
c. Mapping of soil electrical conductivity is one of the basic soil mapping applications and provides information on the natural structure of the soil.
d. Mapping of soil electrical conductivity does not provide useful insights and information in most crops.
Correct: c

Question 13
a. In contactless EC measuring systems, the longer the distance of the electrodes, the longer the width of the electric field and therefore its depth.
b. In contactless EC measuring systems, the longer the distance of the electrodes, the shorter the width of the electric field and therefore its depth.

c. In contact EC measuring systems, the longer the distance of the electrodes, the longer the width of the electric field and therefore its depth.
d. In contact EC measuring systems, the longer the distance of the electrodes, the shorter the width of the electric field and therefore its depth.
Correct: c

Question 14
a. Contactless measuring systems are based on the generation of electromagnetic field to measure soil electrical conductivity and consist of 3 transmitters and 5 receptors that receive the electromagnetic field.
b. Contactless measuring systems are based on the generation of electromagnetic field to measure soil electrical conductivity and consist of 1 transmitter and at least 5 receptors that receive the electromagnetic field.
c. Contactless measuring systems are based on the generation of electromagnetic field to measure soil electrical conductivity and consist of 1 transmitter and 2 receptors that receive the electromagnetic field.
d. Contact measuring systems are based on the generation of electromagnetic field to measure soil electrical conductivity and consist of 1 transmitter and 2 receptors that receive the electromagnetic field.
Correct: c

Question 15
a. If an object changes color, this phenomenon is perceived by us because essentially the change in reflection occurred within the visible spectrum.
b. If an object changes color, this phenomenon is perceived by us because essentially the change in reflection occurred within the infrared spectrum.
c. If an object changes color, this phenomenon is perceived by us because essentially the change in reflection occurred within the visible and infrared spectrum
d. If an object changes color, this phenomenon is perceived by us because essentially the change in reflection occurred throughout the electromagnetic spectrum.
Correct: a

Question 16
a. Visible spectrum is approximately the spectral range of 400-750 nm.
b. Visible spectrum is approximately the spectral range of 870-1000 nm.
c. Visible spectrum is approximately the spectral range of 1500-1750 nm.
d. Visible spectrum is approximately the spectral range of 40-65 nm.

Correct: a

Question 17

a. Near infrared spectrum is the spectral range after the visible; namely, after 750 nm.
b. Near infrared spectrum is the spectral range after the visible; namely, after 1000 nm.
c. Near infrared spectrum is the spectral range after the visible; namely, after 1750 nm.
d. Near infrared spectrum is the spectral range after the visible; namely, after 65 nm.

Correct: a

Question 18

a. The interest in the application of remote sensing technologies in agriculture began with the observation of crops through terrestrial sensors.
b. The interest in application of remote sensing technologies in agriculture began with the observation of crop through satellite.
c. The interest in application of remote sensing technologies in agriculture began with the observation of crop through drones.
d. The interest in application of remote sensing technologies in agriculture began with the observation of crop through aerial images.

Correct: b

Question 19

a. In vigorous plants, reflectance at green spectrum is high while at red spectrum is low.
b. In vigorous plants, reflectance at green spectrum is low while at red spectrum is high.
c. In vigorous plants, reflectance at green spectrum is high while at near infrared spectrum is even higher.
d. a) and c).

Correct: d

Question 20

a. Healthy plants demonstrate very low reflectance at near infrared spectrum.
b. Healthy plants demonstrate very high reflectance at near infrared spectrum.
c. Healthy plants demonstrate very low reflectance at blue spectrum.
d. Healthy plants demonstrate very high reflectance at blue spectrum.

Correct: b

Question 21

a. Stressed plants demonstrate a decrease in reflectance at the near infrared spectrum.
b. Stressed plants demonstrate an increase in reflectance at the near infrared spectrum.
c. Stressed plants demonstrate a decrease in reflectance at the blue spectrum.
d. Stressed plants demonstrate an increase in reflectance at the blue spectrum.

Correct: a

Question 22

a. The profile of plant reflectance is called spectral signature.
b. The profile of plant reflectance is called infrared signature.
c. The profile of plant reflectance is called near infrared signature.
d. The profile of plant reflectance is called digital signature.

Correct: a

Question 23

a. Remote sensing data collection involves 'isolating' specific spectral reflection wavelengths/ multi-spectral data collection from satellite data.
b. Remote sensing data collection involves 'isolating' specific spectral reflection wavelengths/ multi-spectral data collection from terrestrial sensors.
c. Remote sensing data collection involves 'isolating' specific spectral reflection wavelengths/ multi-spectral data collection from drones.
d. All of the above.

Correct: d

Question 24

Which of the following datasources has the highest possible remote sensing accuracy?

a. Satellite data
b. Drone imagery
c. Data from stationary sensors
d. Data from yield sensors

Correct: b

Question 25

a. Different areas have different growing conditions, but the availability of nutrients that plants can use effectively remains the same for most of the field.

b. Different areas have similar growing conditions, and therefore the availability of nutrients that plants can use effectively shows no significant difference.
c. Different areas have different growing conditions, which largely determine the availability of nutrients that plants can use effectively.
d. Different areas have similar growing conditions, but the availability of nutrients that plants can use effectively varies greatly in space.
Correct: c

Question 26
a. On the "real-time" variable rate fertilization, reflectance sensors are placed on the tractor or fertilizer distributor and determine the needs of the plants on the spot where the fertilizer system is located.
b. On the "real-time" variable rate fertilization, a field variability map is created in advance and "loaded" into the fertilizer system.
c. On the "real-time" variable rate fertilization, fixed ground sensor networks determine plant needs and send instructions to the mobile fertilizer system.
d. None of the above.
Correct: a

Question 27
a. On the application of variable rate fertilization with prescription map, reflectance sensors are placed on the tractor or fertilizer distributor and determine the needs of the plants on the spot where the fertilizer system is located.
b. On the application of variable rate fertilization with prescription map, a field variability map is created in advance and "loaded" into the fertilizer system
c. On the application of variable rate fertilization with prescription map, fixed ground sensor networks determine plant needs and send instructions to the mobile fertilizer system.
d. None of the above.
Correct: b

Question 28
a. On the application of variable fertilizer with application map, a position detection system (GPS) is required in the fertilizer system.
b. On the "real-time" variable fertilizer application, a position detection system (GPS) is required in the fertilizer system.
c. On the "real-time" variable fertilizer application, a geo-informatics system (GIS) is required in the fertilizer system.
d. None of the above.

Correct: a

Question 29

a. Yield mapping system is one of the first precision agriculture applications.
b. Yield mapping system is one of the most modern precision agriculture applications.
c. Yield mapping system is one of the precision agriculture applications that have not been tested in real conditions yet.
d. Yield mapping systems have not been applied for precision agriculture.
Correct: a

Question 30

a. Very few modern harvesters have an integrated yield mapping system.
b. Almost all harvesters have an integrated yield mapping system.
c. No commercial harvester has integrated any yield mapping system yet, but it is easy to install a new one.
d. Operational yield mapping systems have not been developed in commercial harvesters yet.
Correct: b

Question 31

e. Most mapping systems consist of a positioning system and a ripeness assessment system of the harvested fruit.
f. Most mapping systems consist of a ripeness assessment system of the fruit and a system for weighing or measuring the flow of the harvested products.
g. Most mapping systems consist of a positioning system and a system for weighing or measuring the flow of the harvested products.
h. Most mapping systems consist of a positioning system and nothing else.
Correct: c

Question 32

a. Yield mapping generates a map that divides the agricultural parcel into high or low yield zones.
b. Yield mapping generates a map that divides the agricultural parcel into high or low robustness.
c. Yield mapping generates a map that divides the agricultural parcel into management zones based on their yield.
d. a) and c)
Correct: d

Question 33

a. The Veris system performs measurement of the electrical conductivity without contact.
b. The Veris system performs measurement of the electrical conductivity with contact.
c. The Veris system performs measurement of the soil nutrients.
d. None of the above.
Correct: b

Question 34
a. The most important property of chlorophyll used by remote sensing is within visible spectrum.
b. The most important property of chlorophyll used by remote sensing is within near infrared spectrum.
c. The most important property of chlorophyll used by remote sensing is within ultraviolet spectrum.
d. The most important property of chlorophyll used by remote sensing is within green spectrum.
Correct: b

Question 35
For field delineation into management zones, the most critical soil parameter is:
a. Electrical conductivity
b. Soil temperature
c. Soil pH
d. Radiation reflectance.
Correct: a

Question 36
a. The EM38 system measures the electrical conductivity without contact.
b. The EM38 system measures the electrical conductivity with contact.
c. The EM38 system measures the soil nutrients.
d. None of the above.
Correct: a

Question 37
Vegetation appears green to us as they have higher reflectance in the visible spectrum:
a. Green
b. Red
c. Infrared
d. Ultraviolet

Correct: a

Question 38

a. Satellites have almost all the advantages of drones in terms of data collection.
b. Drones have almost all the advantages of satellites in terms of data collection.
c. Satellite sensors have much higher resolution than drones' cameras, as they are much more expensive tools.
d. a) and c)

Correct: b

Question 39

Which remote sensing datasource can be used for variable fertilization application?

a. Satellites
b. Drones
c. Ground sensors
d. All of the above

Correct: d

Question 40

a. An active sensor does not use its own energy source, but records signals already present in environment.
b. An active sensor does not record signals already present in environment, but uses its own energy source to perform a measurement.
c. An active sensor uses both its own energy source and records signals already present in environment to perform a measurement.
d. None of the above.

Correct: b

Question 41

a. High sensor accuracy is the capacity of a sensor to give results close to the true value of the measured quantity.
b. High sensor accuracy is the capacity of a sensor to give measurements that do not require any further processing.
c. High sensor accuracy is the capacity of a sensor to give the same reading when repetitively performing the exact same measurement under the same conditions.
d. None of the above.

Correct: a

Question 42

a. Precision is the capacity of a sensor to give results close to the true value of the measured quantity.
b. Precision is the ability of a sensing system to give the same reading when repetitively performing the exact same measurement under the same conditions.
c. High sensor accuracy is the capacity of a sensor to give measurements that do not require any further processing.
d. None of the above.

Correct: b