



DEPARTMENT OF AGRICULTURAL ENGINEERING

Staff In-Charge: R.Muthuminal

Course: 19AGT203 Automation Techniques
in Agriculture Engineering

Semester: IV

Class : II Year B.E AGRI

Academic Year: 2023-24 (Even Semester)

TWO MARKS QUESTIONS AND ANSWERS

1. What is the concept of precision farming?

Precision agriculture (PA) is the science of improving crop yields and assisting management decisions using high technology sensor and analysis tools. PA is a new concept adopted throughout the world to increase production, reduce labor time, and ensure the effective management of fertilizers and irrigation processes.

2. What is the role of precision farming?

For minimizing the cost of materials and resources, like water, seeds, fuel, etc.; maintaining soil health by reducing the number of pesticides; lowering agriculture's dependence on weather conditions; maximum realization of the genetic potential of the produced crops.

3. What is an example of precision farming?

Some examples of precision agriculture include drones, Global Positioning Systems (GPS) and irrigation technologies. The goal of precision agriculture is to learn new management practices to increase the profitability of agriculture production.

4. What are the steps in precision farming?

The basic steps in precision farming are, assessing the variability, managing the variability and evaluating the variability. The available technologies enable us in understanding the variability and by giving site-specific agronomic recommendations we can manage the variability that makes precision agriculture viable.

5. Who is the father of precision farming?

Professor Pierre C. Robert is considered as the Father of Precision farming. like remote sensing, GPS and Geographical Information System (GIS) for improving productivity and profitability.

6. List the 5 R's of precision farming.

The 5 Rs of PA include: applying the Right Input, at the Right Amount, to the Right Place, at the Right Time, and in the Right Manner.

7. List the effect of precision farming on environment?

7% increase in fertilizer placement efficiency. 9% reduction in herbicide and pesticide use. 6% reduction in fossil fuel use. 4% reduction in water use.

8. What is the soil and water conservation?

Soil and water conservation are those activities at the local level which maintain or enhance the productive capacity of the land including soil, water and vegetation in areas prone to degradation through. prevention or reduction of soil erosion, compaction, salinity; conservation or drainage of water and.

9. What are the objectives of soil and water conservation?

Purpose of Soil and Water Conservation Measures to control runoff and thus prevent loss of soil by soil erosion, to reduce soil compaction; to maintain or to improve soil fertility; to conserve or drain water; to harvest (excess) water

10. What is the importance of soil and water conservation in India?

Soil conservation also helps to minimize the following: Loss of fertile and arable land, impacting crops and livestock production, as well as the economy. Pollution and sedimentation flowing in streams and rivers, affecting fish and other species.

11. What are the main types of soil and water conservation techniques?

Soil and water conservation measures

1 Contour farming. Contour farming is one of the most commonly used agronomic measures for soil and water conservation in hilly agro-ecosystems and sloppy lands. ...

2 Choice of crops.

3 Crop rotation.

4 Cover crops.

5 Intercropping.

6 Strip cropping. .

7 Mulching.

8 Conservation tillage

12. Short notes on water conservation.

Water conservation is the practice of using water efficiently to reduce unnecessary water usage. According to Fresh Water Watch, water conservation is important because fresh clean water is a limited resource, as well as a costly one.

13. What is water management?

Water Resources Management (WRM) is the process of planning, developing, and managing water resources, in terms of both water quantity and quality, across all water uses. It includes the institutions, infrastructure, incentives, and information systems that support and guide water management.

14. Enlist different types of soil conservation methods

Various types of soil conservation methods are:

- Planting trees as roots prevent soil erosion.
- Practicing crop rotation maintains soil fertility.
- Regularly watering the soil to prevent soil erosion by wind.
- Organisms like earthworms are added to the soil which increases the fertility of the soil.

15. What is the difference between pressurized and surface irrigation?

In surface irrigation, water is distributed on the ground by gravity or gravity. For this reason, surface irrigation is also called gravity irrigation. In pressurized irrigation, pumps and pipes are used to transfer water and sprinklers are used to distribute water on the farm surface.

16. Why is a pressurized irrigation system important?

Pressure regulators can be used to significantly improve irrigation system efficiency resulting in lower costs, improved crop yields, reduced runoff, and conserved water.

17. What is the advantage of automated watering system?

- Timely irrigation
- Plants being watered when needed. Management of higher flow rates
- Accurate cut-off of water compared to manual checking
- Reduced runoff of water and nutrients

18. Importance of pressure water.

Too much pressure could cause leaks¹, and too little can make for an underwhelming shower experience. Having adequate water pressure is essential because it allows the use of multiple water sources at the same time without affecting their individual functions

19. What is an automated system for watering plants?

Automatic Watering is a system that takes water from the tap to your plants using a simple network of narrow pipes and outlets hidden in the garden. This can be controlled manually or by an electronic water controller. An Automatic Watering system takes the work out of watering.

20. Why is pressure important to the environment?

Pressures can change the state of an environment – e.g. water quality reductions – which then causes impacts such as the loss of biodiversity and ecosystem services provision. Such state changes and impacts can trigger societal and political responses and interventions to help mitigate environmental harm.

21. What are the functions of food industry?

Food Industry: Food industry is manufacturing place where food products are processed, packed and distributed.

Different divisions involved in Food Industry include, Raw material Procurement, Preservation of Raw material, Processing of Raw material, Packaging of finished product and distribution of the product.

Various functions of food industry are cleaning, Concentrating, Controlling, Disintegrating, Drying, Evaporation, Fermenting, Foaming, Heating/Cooling, materials handling, Mixing, Packaging, Pumping, separating and others.

22. How do the Energy is measured in terms of Kilocalories?

A Calorie is the amount of heat required to raise the temperature of one gram of water by one degree Celsius.

23. What is Food processing?

Food Processing is the process of transforming food items into a form that can be used. It can cover the processing of raw materials into food via different physical and chemical processes. Various activities covered in this process are mincing, cooking, canning, liquefaction, pickling, macerating and emulsification.

It takes clean, harvested crops, or butchered and slaughtered animal products to produce attractive, marketable, and in several cases, life-long food products. However, food processing can also lower the nutritional value of the food and might include additives that might adversely affect health.

24. Objectives of Food Processing

Food technology is a very vast domain concerning with the production and processing of food. Food processing has certain objectives, such as:

- It boosts the shelf life of food products.
- Prevent food-contamination.
- Food storage and Transportation.
- Turns raw food materials into attractive, marketable products.
- Provide employment to a large population.

25. Benefits of Food processing

The important benefits of food processing include:

1. Food processing reduces the number of harmful bacteria in food that can cause diseases. For eg., drying, pickling dehydrates the food product and alters the pH that prevents the growth of harmful microorganisms.
2. It also improves the shelf-life of food products.
3. It reduces health inequalities and major health concerns.

26. Drawbacks of Food Processing

The important drawbacks of food processing include:

Processed food contains artificial ingredients.

A large number of resources are spent in making the food pleasant to the brain that leads to overconsumption.

Processed foods are the biggest source of added sugar that is very unhealthy.

27. What is thermal and non-thermal processing?

Processing of foods without the application of heat is termed as the non-thermal processing. The most widely used non-thermal processing techniques are high pressure processing, pulsed electric field, ultrasound, pulsed light, ultraviolet light, irradiation, oscillating magnetic field etc.

28. What is the difference between thermal and non-thermal energy?

While thermal emission depends on the temperature of the emitting source, non-thermal emission depends on other things, such as the relative proportions of excited states of atoms and magnetic field strength. Examples of non-thermal radiation include synchrotron radiation, maser emission, and Compton scattering.

29. What is an example of non-thermal energy?

Non-thermal radiation is electromagnetic radiation given off by particles for reasons other than their thermal energy. The commonest example in astrophysics is synchrotron radiation, produced by the acceleration of electrons or other charged particles by a magnetic field.

30. What is extrusion processing?

Extrusion processing is a commonly used processing technology in the food industry with a wide number of applications. It is a processing system that utilizes a single screw or a set of screws to force food materials through a small opening.

31. Why is the extrusion process important?

Extrusion enables mass production of food via a continuous, efficient system that ensures uniformity of the final product. Food products manufactured using extrusion usually have a high starch content.

32. What is an advantage of extrusion?

- Low cost per part.
- Flexibility of operation.
- In hot extrusion, post execution alterations are easy because product is still in heated condition.
- Continuous operation.
- High production volumes.

33. What are the limitations of extrusion process?

- Variations in size of product.
- Product limitations because of only one type of cross section can be obtained at a time.
- High initial cost setup.

34. What is extrusion ratio?

The extrusion ratio of a shape is a clear indication of the amount of mechanical working that will occur as the shape is extruded. Extrusion Ratio = area of billet/area of shape.

35. What are the two forms of biochemical conversion?

Biochemical conversion processes include anaerobic digestion or decomposition and anaerobic fermentation. These processes occur at lower temperatures and lower reaction rates compared to thermochemical processes.

36. What is biochemical conversion of solid waste management?

The biological conversion process involves using micro-organisms to decompose the bio-degradable components of the waste. Thermal conversion involves conversion of waste into gaseous, liquid and solid products with the release of heat energy.

37. What is the thermochemical conversion?

Thermochemical conversion processes include combustion, gasification, and pyrolysis. Potential energy types include heat, steam, electricity, and liquid fuels (biofuels if the feedstock is biomass).

38. What is thermochemical conversion of biomass to liquid fuels and chemicals?

The two primary approaches to using thermochemical process to convert biomass into fuels and chemicals are gasification and pyrolysis.

39. What are the applications of agriculture sensors?

Agriculture sensors such as air temperature and humidity, soil moisture, soil pH, light intensity, and carbon dioxide are often used to collect data in all aspects of crop growth such as nursery, growth, and harvest.

40. What are two applications of remote sensing in agriculture?

Remote sensing applications have been playing a significant role in agriculture sector for evaluating plant health, yield and crop loss (%) estimation, irrigation management, identification of crop stress, weed and pest detection, weather forecasting, gathering crop phenological informations etc.

41. What is the application of humidity sensor in agriculture?

A crop-monitoring system using wireless sensor networking

The humidity sensor detects, monitors, and records both humidity and air temperature. Measuring humidity and controlling temperature are critical aspects of growing crops.

42. What are the benefits of good design?

- To improve screen clarity and readability.
- It reduces decision making time.
- Identifying and resolving problems during the design and development

43. Write any 2 differences between GUI and Webpage design.

GUI design	Webpage design
Characteristics of interface such as monitor and modem are well designed	The user device may range from handheld mechanism to high end work station.
It navigate through structured menus ,lists ,screens dialogs and wizards.	It navigate through links, book marks and typed URL's.

44. What are the guidelines for designing conceptual model?

- Reflect the user's mental model.
- Provide proper and correct feedback.
- Provide action-response compatibility.
- Provide design consistency.

45. What are goals of interface design?

The goals in interface design are

- Reduce visual work.
- Reduce intellectual work.
- Reduce memory work.
- Reduce motor work.

46. What is the use of AI and IoT in agriculture?

Some of the applications of AI and IoT in Agriculture are in the areas of Precision Farming, Agricultural Drones and Hopping systems, Livestock Monitoring, Monitor Climate Conditions, Smart Greenhouses, AI and IoT based Computer imaging etc

47. Benefits of IoT in agriculture industry

- Enhanced Production Rates.
- Water Conservation
- Real-Time Data and Insights
- Reduction in Operation Costs
- High-Quality Production
- Accurate Farm and Yield Evaluation
- Improved Livestock Production

48. What is the impact of IoT in agriculture in India?

The Internet of Things (IoT) is capable of revolutionizing the agricultural industry, enabling farmers to reduce waste and enhance productivity. By leveraging IoT technology, farmers can now precisely monitor and adjust the quantity of fertilizer used and the amount of water used for irrigating a field.

49. What are the risks of IoT in agriculture?

With IoT, farmers can make their farms more efficient and profitable. However, it also leaves business owners, including those in the agricultural industry, open to hackers. All computerised equipment used for day-to-day operations is at risk of being hacked.

50. What is IoT for agriculture food quality and safety?

Internet of things (IOT) is a technology with a vision to connect anything at anytime and anywhere. Utilizing IOT in the food supply chain (FSC) is believed to enhance the quality of life by tracing and tracking the food conditions and live-sharing the obtained data with the consumers or the FSC supervisors.