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## UACE P515/1 Principles and practices of agriculture 2015

### SECTION A (30 MARKS)

Write the letter corresponding to the correct answer

- Grass is cut at early flowering stage to make hay because at this stage grass
  - Supplies more fibre
  - Is highly palatable
  - Has a high level of nutrients
  - Has much dry matter
- Which one of the following pairs of diseases is caused by viruses?
  - Anthrax and brucellosis
  - Rinderpest and foot and mouth diseases
  - Trypanosomiasis and Coccidiosis
  - Tuberculosis and mastitis
- Which one of the following is not a benefit of being a member of a cooperative society?
  - Using the society as a collateral to access loan
  - Selling agricultural commodities at a fair price
  - Getting a higher profit due to marketing costs
  - Accessing agricultural inputs reduced prices
- Which one of the following occurs to food when passed the reticulum in ruminants?
  - It is ground into fine particles
  - It is mixed with cellulose from the rumen
  - Volatile fatty acids are squeezed out of food
  - Coarse particles are separated from fine ones
- A farm storage structure should possess the following characteristics except
  - A raised floor
  - A smooth interior surface
  - Good ventilation
  - A slanting floor
- Which one of the following is not a benefit of mixed pasture?
  - Ease grazing management.
  - Speeds up the coverage of soil surface

- C. Ensures the stability of pasture production
  - D. Is security against total pasture loss due to pests and disease
7. Which one of the following is the least important characteristic to consider when carrying out livestock selection and breeding
    - A. Increased milk yield in dairy cattle
    - B. Production of lean meat in beef cattle
    - C. Coat colour of animal
    - D. Increased disease resistance
  8. Which one of the following does not determine the spacing of a crop?
    - A. Soil fertility
    - B. Depth of planting
    - C. Growth habitat
    - D. Ease of weeding
  9. The following should be considered before applying a control measure for pest except the
    - A. Motility of the pest
    - B. Physiology of the pest
    - C. Stage of development of the pest
    - D. Morphology of the pest
  10. Which one of the following occurs in homogenization of milk?
    - A. Milk is cooled to a temperature below 40C
    - B. Fat is removed from milk
    - C. Fat globules are broken up
    - D. Milk is heated to a temperature just below boiling point
  11. Which one of the following is not considered when formulating rations for animals
    - A. Amount of feed given to each animal
    - B. Health status of the animal
    - C. Physiological state of the animal
    - D. Productivity level of the animal
  12. Which one of the following soil properties increases in particle size?
    - A. Capillarity
    - B. Pore space
    - C. Water retention
    - D. Humus content
  13. Which one of the following does not explain why goat rearing is encouraged in Uganda?
    - A. Goats are secondary grazers that do not need much attention
    - B. Goats meat is considered delicious by most customers
    - C. Goats are browsers which do not compete with cattle or sheep
    - D. Goats are hardy and can be kept in area of low potential
  14. During seedbed preparation, a disc plough is preferred to mould board plough because it
    - A. Faster
    - B. Pulverizes the soil clods
    - C. Levels the field for easier planting

- D. Rolls over field obstacles
15. The ability of a construction material to remain extended in all direction when subjected to a compressive force is its
- A. Hardness
  - B. Malleability
  - C. Toughness
  - D. ductility
16. Legumes and grass grown in the same pasture are examples
- A. joint products
  - B. competitive products
  - C. complementary products
  - D. supplementary products
17. Desirable traits from a sire can be spread fast through
- A. Multiple ovulation
  - B. Artificial insemination
  - C. Natural mating
  - D. Grading up
18. The method of fertilizer application does not depend on the
- A. Type of fertilizer
  - B. Type of crop
  - C. Stage of crop growth
  - D. Acidity of the soil
19. Trypanosomiasis is a protozoan disease which can be controlled by
- A. Imposing a quarantine
  - B. Isolating the affected animals
  - C. Spraying insecticide in grazing area
  - D. Regular dipping of animals
20. Which one of the following methods best conserves soil and water by reducing surface runoff in a garden?
- A. Mulching
  - B. Crop rotation
  - C. Planting cover crops
  - D. Wind brakes
21. One advantage of propagating pineapple using crowns is that the crop
- A. Matures early
  - B. Matures uniformly
  - C. Produces large fruits
  - D. Is more resistant to disease
22. Which one of the following is the best practice of managing waste resulting from organic farming in urban
- A. Growing crops which produce less fuel
  - B. Turning organic waste into fuels

- C. Allowing the waste to rot
  - D. Using waste materials as livestock feed
23. In a bee colony, ventilating the hive is necessary to
- A. Keep the bees comfortable
  - B. Prevent the melting of honey
  - C. Allow proper hatching of the eggs
  - D. Prevent honey from melting
24. The following are challenges that farmers face except
- A. price fluctuation
  - B. occurrence of pest diseases
  - C. cost of production of input
  - D. government policies
25. The best method to use in selecting a sire for breeding on a dairy farm is
- A. Pedigree selection
  - B. Family selection
  - C. Individual selection
  - D. Progeny testing
26. Which one of the following summarizes the common roles of women in farming communities in Uganda?
- A. Weeding, harvesting and processing crops
  - B. Opening up land for crop production
  - C. Construction of storage facilities for crops
  - D. Decision making on farm activities
27. Which one of the following represents hybridization in crop breeding?
- A. Crossing of recessive trait with those of a dominant trait
  - B. Crossing high yielding crop varieties with disease resistant varieties
  - C. Multiplying plants with desirable qualities
  - D. Crossing a plant with known genotype with that of unknown genotype
28. A lever was used to lift a load of 80N by applying effort of 20N. What was the mechanical advantage of the lever?
- A. 4
  - B. 60
  - C. 100
  - D. 1600
29. Compost is added to a fish pond before introducing fingerlings in order to
- A. provide food to the fingerlings
  - B. provide material for breeding nests
  - C. give pond water a dark color to protect fish
  - D. encourage growth of water plants and algae
30. Which one of the following leads to opening of stomata in a leaf?
- A. Loss of water by the guard cells
  - B. High concentration of starch in the guard cells

- C. Low concentration of starch in the guard cells
- D. High concentration of sugars in the guard cells

## SECTION B

Answer all questions

31. (a) Give five reasons why women's participation in large scale production is limited (05marks)  
(b) Suggest five ways of encouraging women to participate in agricultural production. (05Marks)
32. (a) What is mutation? (01mark)  
(b) Describe the following types of mutation  
(i) substitution (01mark)  
(ii) Polyploidy (01mark)  
(c) Explain why polyploidy may be desirable in crop production (02marks)  
(d) Give **five** ways in which genetic engineering can be used to improve crops (05marks)
33. (a) give four factors that have encouraged the keeping of bees in Uganda (04marks)  
(b) Explain four measures that can be taken to protect bee-hive from predators. (02marks)  
(c) Give two factors that encourage colonization of bee-hive. (02marks)
34. (a) What is **agricultural policy**? (01 marks)  
(b) State four objectives that agricultural policies aim to achieve (04marks)  
(c) How do agricultural research organizations contribute to the development of agriculture in Uganda? (05marks)
35. (a) Give **five** challenges that farmers face in fish farming (05marks)  
(b) Outline **five** management practices that should be carried out to ensure successful rearing of fish to maturity in a pond. (05marks)
36. (a) State **three** factors that influence soil erosion. (03marks)  
(b) Give **four** effects of poor soil aeration  
(c) Explain **three** measures a farmer can take to improve soil aeration
37. (a) Outline four activities carried out on a farm which are based on working of simple machine (04marks)

Suggested answers

- |    |    |    |     |     |     |     |     |     |     |     |
|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1C | 4A | 6D | 9D  | 12B | 15C | 18D | 21A | 24C | 27B | 30D |
| 2B | 5D | 7C | 10C | 13C | 16A | 19C | 22B | 25A | 28A |     |
| 3A | 5D | 8B | 11A | 14B | 17B | 20C | 23D | 26A | 29D |     |

Comments

1. The key to quality hay is to cut grass at an early stage when it is abundant and nutritious. AS a general rule, thi is during the early **flowering stage**.

4. From reticulum food goes to omasum which further grinds and breaks down feed.

15. **Hardness:** This measures a material's resistance to deformation, particularly scratching, cutting, or abrasion. A harder material is more resistant to these types of damage. For example diamond is extremely hard and resists scratching. While **Toughness** measures a material's ability to absorb energy and resist fracturing or breaking under stress. A tougher material can withstand more impact without breaking e.g. rubber is tough because it can absorb significant energy without breaking.
16. Joint products are created together in a single production process.
17. Desirable traits from a sire (male parent) can be spread quickly through **artificial insemination (AI)**.
18. Acidity of the soil determines the nature of fertilizers but not method of application.
19. Spraying kills the vector/tsetse fly
20. Mulching conserves water by preventing evaporation
24. Farmers incur cost of inputs but not cost of production of input
28. Mechanical advantage =  $\frac{\text{Load}}{\text{effort}} = \frac{80}{20} = 4$

## SECTION B

31. (a) Give five reasons why women's participation in large scale production is limited (05marks)

- Lack of land and other resource to carry out agriculture
- Lack security to obtaining credit
- Majority are illiterate with limited education
- Reproductive responsibility and children raising deny them enough time to engage in agriculture
- Lack of adequate time in agriculture due to their physiology such as pregnancy
- Inability to use big machines
- Poor /low income which makes it difficult for them to raise capital.
- Long distances to the market.
- Low access to information
- Introduction of modern crop hybrids that require additional labor.
- Low self-esteem of women in decision making

(b) Suggest five ways of encouraging women to participate in agricultural production. (05Marks)

- Encourage women to own land on which to grow crops even in absence of husbands.
- Promote positive self-esteem of women in decision making
- Increase women in agricultural education.
- Promote women in order to get credit.
- Build a positive attitude of women towards agriculture.
- Women should be encouraged to participate in extension workers' meeting.
- Provision of social services in rural areas where most women reside.

32. (a) What is mutation? (01mark)

This is a change in the amount or structure of DNA of an organism

(b) Describe the following types of mutation

(i) substitution (01mark)

**Substitution;** occurs when one base in a gene is replaced with another e.g., sickle cell anemia

(ii) Polyploidy (01mark)

Polyploidy occurs when there is an increase in the entire haploid sets of chromosomes.

(c) Explain why polyploidy may be desirable in crop production (02marks)

Polyploidy produces crops that are

- increased sized of plant
- high resistance to harsh climate
- increased yield
- increased resistance to diseases

(d) Give **five** ways in which genetic engineering can be used to improve crops (05marks)

It produces crops that are

- Faster growing plants and animals.
- More nutritious food.
- Tastier food.
- Drought-resistant plants that require fewer environmental resources (such as water and fertilizer)
- Pest and disease resistant crops and animals
- Increased supply of food with reduced cost and longer shelf life.
- Increased medicinal content

33. (a) Give four factors that have encouraged the keeping of bees in Uganda (04marks)

- Bees produce honey, pollen, wax and royal jelly.
- Bees pollinate crops
- Bees contribute to agro-tourism
- Bee keeping provide employment
- Bee keeping is a source of income
- Bees provide products for treatment of human diseases (apitherapy)
- Bees are being used in modern warfare in detection of explosives and narcotics
- Entomological research.

(b) Explain four measures that can be taken to protect bee-hive from predators. (02marks)

- Suspend hive on wire to guard off honey badgers
- Seal off cracks and crevices on the hive
- Spread wood ash around hive wire poles
- Fence the apiary to exclude predator
- Cut off any vegetation touching hives
- Dispose of any infected combs

- Capture and kill predators
- Use scarecrows for bird

(c) Give two factors that encourage colonization of bee-hive. (02marks)

- Baiting: different baits are used to attract bees to the hive such honey and lemon grass.
- Providing a good environment in and around the hive i.e. cool dark environment
- Planting flowering plants; bee prefer to inhabit hives close to the flowing plants
- Placing a hive near a source of water
- Control predators like birds
- Capturing and placing the queen in the hive
- Using of pheromones in the new hive to attract bees in the hive
- Capturing and transferring a swam into the hive.

34. (a) What is **agricultural policy**? (01 marks)

An agricultural policy is a set laws relating to domestic agriculture and import of of foreign agricultural product.

(b) State four objectives that agricultural policies aim to achieve (04marks)

- Ensure household and national food and nutrition security for all Ugandan
- Increase income of farming households from crop, livestock, fisheries and all other agriculture related activities
- Promote specialization in strategic, profitable and viable enterprises and value addition through agro zoning
- Promote domestic regional and international trade in agricultural products
- Ensure sustainable use and management of agricultural resources
- Develop human resource for agricultural development

(c) How do agricultural research organizations contribute to the development of agriculture in Uganda? (05marks)

- Develop new crop varieties and animal breeds
- Test new crop varieties, animal breeds and machinery to determine how they perform in different environmental conditions
- Improvement of the existing crop varieties and animal breeds
- Train farmers on modern agricultural practices
- Finding the best methods of guarding against pests, parasites, weeds and diseases
- Develop new farming machinery and improve on the existing ones to adapt to local conditions
- Evaluation and testing chemicals on crops and animals
- Comparing performance of crops and animals to a particular environment.



35. (a) Give **five** challenges that farmers face in fish farming (05marks)

- Lack of land/space for ponds
- Lack of education and skills in fish farming
- Shortage of inputs
- Limited funding
- High costs for fish feeds
- High pollution of water and swamps
- Limited research
- Some culture and religion restrict consumption of some species
- Low level of technology
- Legal restriction on fish farming in swamps.
- Disease and pests

(b) Outline **five** management practices that should be carried out to ensure successful rearing of fish to maturity in a pond. (05marks)

- Select good quality fish species
- Maintain optimal fish population
- Fertilize the pond to boost algae growth
- Feed the fish regularly and remove excess food and debris from the pond
- Observe the fish for healthy swimming, eating, and breathing behavior
- Monitor and control the water level, temperature, pH and quality, and add new water if needed
- Clean the pond and the pump, filter, lines, and fountains regularly
- Manage the nearby plants and grow water plants to provide shade and oxygen
- Control water weeds and predators

36. (a) State **three** factors that influence soil erosion. (03marks)

- Rainfall intensity
- Vegetation cover
- Topography
- Soil type
- Farming methods
- Type of crop
- Presence or absence of soil control measures

(b) Give **four** effects of poor soil aeration

- Reduced microbe activity
- Reduced root growth and expansion
- Increased denitrification
- Wilting and yellowing of plants due to reduced absorption of salts
- Anaerobic conditions leading to formation of harmful acids

(c) Explain **three** measures a farmer can take to improve soil aeration

- Turn over the top layer of soil through tilling.
- Drain water logged soil
- Use additives such orchid bark, perlite, coarse sand, vermiculite, and agricultural charcoal.
- Create holes for oxygen to penetrate the ground using spike aerator.
- Add wetting agents to improve oxygen levels.
- Incorporate organic matter such as compost, leaf litter, or manure to improve soil texture
- Cover crops like clover or rye can help break up compacted soil and improve its structure over time
- Limit foot traffic not to compact soil
- Broad forking manually loosen the soil without turning it over can help improve aeration while preserving soil structure
- Practice crop rotation to prevent soil compaction

37. (a) Outline four activities carried out on a farm which are based on working of simple machine (04marks)

- Cutting using knife and pangas
- Digging using hand hoe
- Digging holes, canals, removing tree stumps using pick mattock
- Raking rubbish using a rake
- Cutting trees using axe
- Lifting using pulleys

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