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## UACE P515/1 Principles and practices of agriculture

### SECTION A (30 MARKS)

Write the letter corresponding to the correct answer in the box provided at the end of each question.

- Which one of the following types of organism in an ecosystem receives the least amount of energy?
  - Tertiary consumers
  - Herbivores
  - Producers
  - Secondary consumers
- One of the following reasons for pruning coffee is to
  - Delay flowering until conditions are favorable
  - Improve the quality of coffee berries
  - Redirect nutrients to actively growing shoot
  - Create unfavorable micro climate for pests
- The following management practice are carried out during the gestation period of a cow **except**
  - Milking
  - Pregnancy diagnosis
  - Heat detection
  - Drying off
- Which one of the following conditions contribute to high sugar content in sugar cane
  - Bright sunshine
  - High humidity
  - High night temperature
  - High rain fall
- Adaptive evolution changes in organism is a result of
  - Mutation
  - Gene flow
  - Selection
  - Gene drift
- Insect pests are very successful because they
  - have great power of movement to reach food
  - are adapted to a wide range of environmental conditions

- C. have short reproductive cycle
  - D. possess efficient biting and chewing mouth parts
7. Which one of the following types of chemicals would be most appropriate in controlling the bean aphid?
- A. Fumigants
  - B. Repellants
  - C. Contact pesticides
  - D. Systemic pesticides
8. Which one of the following is a characteristic of phosphate fertilizers? They
- A. Have scorching effect on plants
  - B. Have long residual effect in the soil
  - C. Are highly hygroscopic
  - D. Are highly soluble
9. If a sheep has dry matter intake of 600g of feed and its fecal output is 350g, which one of the following is the digestibility of the feed?
- A. 1.71%
  - B. 3.33%
  - C. 41.7%
  - D. 58.3%
10. In agricultural production, a measure of the cost of output against the cost of input is described as
- A. technical efficiency
  - B. economical efficiency
  - C. production efficiency
  - D. overall efficiency
11. One way in which settlement differs from resettlement is that settlement
- A. Involves planned transfer of people from one area to another
  - B. Involves transferring people to a less densely populated area.
  - C. Involves transferring people to an area not previously inhabited
  - D. Provides more land for agricultural production
12. Adding organic manure to a fish pond before introducing fish is intended to
- A. Darken pond water for fish production
  - B. Encourage growth of algae and other water plants
  - C. Provide feed for fish
  - D. Provide materials for breeding nest
13. Which one of the following conditions necessitates the use of partial farm budget?
- A. Overhauling of farm business
  - B. Expanding an existing enterprise
  - C. Termination of an enterprise
  - D. Evaluating farm enterprise
14. One of the following cause of high population growth in Uganda is
- A. High fertility rate among women
  - B. Increased food production

- C. Improved communication
  - D. Improved standards of living
15. In mushroom growing, holes are not punched in the polythene paper covering the substrate before the white growth stage in order to avoid
- A. Water entry into the substrate
  - B. Bacterial and fungal infections
  - C. Loss of moisture from the substrate
  - D. Lowering of temperature from growth
16. The efficiency of manual labour on a farm can be improved by
- A. Assigning a specific job to each laborer
  - B. Involving laborer in budgeting
  - C. Taking roll calls
  - D. Prompt payment of laborer
17. Which one of the following is a major challenge in urban farming?
- A. Certain enterprises are not allowed by urban authorities
  - B. High cost of inputs
  - C. High competition among farmers for urban market
  - D. Lack of processing facilities for product
18. A good tree species for agro-forestry should
- A. Have many extensive lateral roots
  - B. Have spreading branches
  - C. Have a non-spreading canopy
  - D. Sprout after repeated pruning
19. In crop improvement, pure line are developed to
- A. Produce new varieties
  - B. Meet the need of consumer
  - C. Adapt crops to local conditions
  - D. Create uniformity
20. The bacteria responsible for oxidation of ammonia to nitrites in the soil is
- A. Clostridium
  - B. Nitrobacter
  - C. Nitrosomonas
  - D. azotobacter
21. The significance of wide spaced hind legs in dairy cows is that it
- A. Accommodates the big udder of the cow
  - B. Give the cow stability when moving
  - C. Facilitates natural mating
  - D. Allows easy udder access for suckling calves
22. Which one of the following groups of livestock diseases is caused by Bacteria?
- A. Tuberculosis, anthrax, colibacillosis
  - B. Rinderpest, Newcastle, fowl pox
  - C. East coast fever, Anaplasmosis, Babesiosis

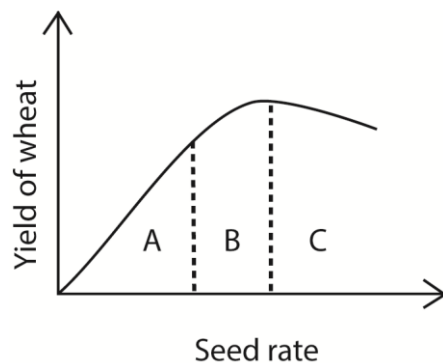
- D. Salmonellosis, foot and mouth disease, Brucellosis
23. Which one of the following is **not** a symptom of a viral infection in plants?
- A. Mottling
  - B. Streak
  - C. Chlorosis
  - D. Wilting
24. Which of the following would be most suitable chemical for cleaning the scrotum for open knife castration
- A. Brine
  - B. Sterilant
  - C. Disinfectant
  - D. antiseptic
25. Which one of the following is a function of epididymis in reproduction?
- A. Carries sperms to urethra
  - B. Produces fluids that clean the urethra
  - C. Store sperms before ejaculation
  - D. Produces fluids that balances the pH of the reproductive tract
26. In marketing, buffer stocks refer to
- A. Goods and services offered during emergency
  - B. Products assembled to be processed into goods
  - C. Products stored for export
  - D. Products stored and released during shortage
27. Which one of the following factors enhances honey production by a bee colony?
- A. Nearness to a water source
  - B. Chemical control of pests around the hive
  - C. Keeping the hive environment clean
  - D. ensuring security around the hive
28. The proportional of the material used in concrete mixing vary according to the
- A. Quality of the ingredient used
  - B. Climate of the area where the structure is to be built
  - C. Type of the structure to be erected
  - D. Availability of material
29. Which one of the following conclusion can made when an egg incubated for five days appear clear during candling
- A. The egg is fertile
  - B. Insufficient incubation was done
  - C. The egg is unfertilized
  - D. The egg is spoiled
30. Which one of the following is the amount of load raised by an effort of 600N applied to a lever of mechanical advantage 4?
- A. 150N
  - B. 596N

- C. 604N
- D. 2400N

SECTION B (70MARKS)

(Answer all questions)

31. Figure 1 shows the yield obtained from wheat grown under the same field conditions but using different seed rates

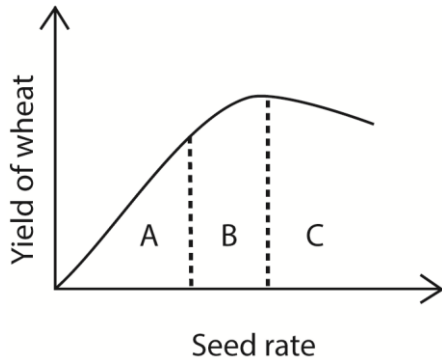


- (a) Describe what is happening in each of the three zones A, B and C. (03marks)
  - (b) Explain the cause of what you have described for each of the zones in (a) (03marks)
  - (c) Outline four factors that affect seed rate (04marks)
32. (a) What is drying off as used in dairy cattle management? (01mark)
- (b) Give five reasons for drying off a lactating cow. (05marks)
  - (c) State four methods that could be used for drying off a lactating cow (04marks)
33. (a) Outline **five** benefits of land consolidation. (05marks)
- (b) Describe the steps involved in consolidating fragmented pieces of land. (05marks)
34. (a) Explain **four** factors that affect the performance of a sprayer. (04marks)
- (b) Give **three** benefits of using a boom sprayer. (03marks)
  - (c) State three maintenance practices that should be carried out on a sprayer to keep it in a good working condition. (03marks)
35. (a) Distinguish between agricultural credit scheme and a subsidy (02marks)
- (b) Outline **three** ways in which subsidy scheme improve production. (03marks)
  - (c) Give **five** ways of improving credit schemes in Uganda. (5marks)
36. (a) Explain **five** factors that should be considered before formulating feed rations for farm animals (05marks)
- (b) Give **five** reasons for including basal feeds in the ration of a farm (05marks)
37. (a) State six ways in which the knowledge of genetic engineering is useful to a crop breeder. (06marks)
- (b) Suggest four negative effects of genetic engineering in crop production (04 marks)

## Solution

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

31. Figure 1 shows the yield obtained from wheat grown under the same field conditions but using different seed rates



(a) Describe what is happening in each of the three zones A, B and C. (03marks)

A: wheat yield increased rapidly/steeply/exponentially with increase in seed rate

B: wheat yield increased slowly with increase in seed rate

C: wheat yield decreases with increase in seed rate

(b) Explain the cause of what you have described for each of the zones in (a) (03marks)

A: increase in seed rate increases crop wheat yield due to increase in the number of Yielding plants per unit area

B: increase in seed rate lead to small increase in wheat yield due to onset of completion for water, space and light

C: increase in seed rate lead to decrease in wheat yield due to high completion for water, space and light and rapid spreading of diseases and pests

(c) Outline four factors that affect seed rate (04marks)

- Size of seed/plant: higher number of seeds/plants are required per unit areas compared to big seeds and plants
- Desired population
- Seed purity/ percentage of pure seeds within a selected seed batch
- Row spacing, the closer the rows the higher the seed rate
- seed placement, the closure the seed holes the higher the seed rate
- planter calibration, the faster and the higher the seeds are planted the higher the seed rate

- Germination rate: high percentages of seeds that germinate ensures higher number of plants per unit area of land
- Seed treatment (e.g. priming, coating) increase the percentage germination and hence higher plant establishment.
- Planting at recommended depth increase the percentage germination and hence higher plant density.

32. (a) What is drying off as used in dairy cattle management? (01mark)

**Drying off** in dairy cattle management refers to the intentional cessation of milking a lactating cow.

(b) Give **five** reasons for drying off a lactating cow. (05marks)

- to allow the cow to restore udder tissues before getting back to lactation
- to allow the cow to replace the minerals depleted during lactation
- To give the fetus enough time to develop and also enough nutrients
- To maintain a high future milk yield in the next lactation
- Enable the cow to gain weight before delivering
- To ensure high quality colostrum at birth
- To enable treatment of sick cow
- To prevent and control spread of diseases
- To treat mastitis

(c) State four methods that could be used for drying off a lactating cow (04marks)

- **Incomplete milking:** this involves milking the cow half way its production capacity so that the remaining milk in the udder exerts pressure on the milk secreting cells which will stop secreting milk.
- Intermittent milking: the cow is milked at intervals of days and later left completely after 5 days or more.
- Cessation Milking: this is when milking stopped once for all. It causes a lot of pain to the animal and can easily result into mastitis
- Dry cow therapy: Here antibiotics are included in feeds which will control mastitis.

33. (a) Outline **five** benefits of land consolidation. (05marks)

- Saves time that could have been wasted moving from plot to plot during farm operations.
- Makes supervision of farm operations easy and less costly since they are in one place.
- It encourages mechanization on a farm since the land is big enough which makes the practice economical.
- Agricultural production is increased due to the size of the land.
- It's easier to provide extension services on the consolidated land.
- Theft of farm produce is reduced due to improved supervision.
- Transport costs of the produce from the garden are reduced since all products are in one place.

- It's easier to control pests and diseases on the farm.
- It's easier to carry out soil and water conservation measures.

(b) Describe the steps involved in consolidating fragmented pieces of land. (05marks)

- Establish land ownership
- Measurement of the plot to be consolidated in order to establish their size.
- Describing the nature of the fragment
- Valuing the fragments to be consolidated
- Recording each fragment of land for further consideration
- Issuing of the title for the consolidated land or fragments.

34. (a) Explain **four** factors that affect the performance of a sprayer. (04marks)

- Pressure and delivery of the pump
- Speed of forward travel active ingredient to water ratio in the tank
- Height of boom
- Nozzle spacing.

(b) Give **three** benefits of using a boom sprayer. (03marks)

- Uniform Coverage. The arrangement of multiple spray nozzles ensures even distribution of chemicals, minimizing risk of under or over application.
- Reduced Labour Costs.
- Precision Application.
- Wind Resistance.

(d) State three maintenance practices that should be carried out on a sprayer to keep it in a good working condition. (03marks)

- Drain the tank of the sprayer before and after use
- Fill the sprayer with water overnight if it is to be used the following day
- Wash both internal and external part of the sprayer when changing to another chemical
- Wash the sprayer at the end of the spraying season with soda (0.5kg of soda in 50 liters of water)
- Remove and clean all the nozzles
- Inspect valves for wear and replace in time
- Keep stock of all spares for replacement

35. (a) Distinguish between agricultural credit scheme and a subsidy (02marks)

Agricultural credit is financial assistance given to farmers either in cash or kind that to be repaid at an agreed interest and time/loan to farmers to aid in agricultural production while a subsidy is an incentive given to the farmers usually in form of reduced prices by the government.

(b) Outline **three** ways in which subsidy scheme improve production. (03marks)

- Stabilize price of agricultural products
- Supplement farmers' income
- Ensure that the domestic food supply is secure.
- Protect farmers from excessive loss in case of calamities



(c) Give **five** ways of improving credit schemes in Uganda. (5marks)

- Lowering interest rates
- Lowering lending cost and loan processing period
- Improve client – lenders relationships
- Liberalization of financial sector
- Implementing agricultural insurance policies to reduce lending risks.
- Enforce laws to protect borrowers' from financial institution greed
- Financial training to the farmers.
- Flexible repayment schedule
- Group lending to reduce risks and supervision costs.

36. (a) Explain **five** factors that should be considered before formulating feed rations for farm animals (05marks)

- The nutrient requirement of for the animals whose ration is being formulated
- The palatability or acceptability of the final mixture of the feed
- Availability of ingredients and their cost
- Health status of the animal
- Nutrient composition of the final mixture
- Physical nature of feed
- The wholesomeness of the food stuff. The final mixture should not harmful to the animals
- Age of animal i.e. young animal requires high proportion of proteins
- Level of production for instance milk cattle and layer require high proportion of calcium.
- Type of animal for instance ruminant can digest cellulose

(b) Give **five** reasons for including basal feeds in the ration of a farm (05marks)

- **Nutritional Balance:** Basal feeds are essential for meeting the basic nutritional requirements of animals. They provide energy proteins, vitamins and minerals necessary for proper growth
- **Digestive Health:** Basal feeds are highly digestible and aid in efficient digestion.
- **Supplementing Concentrates:** Basal feeds complement protein concentrates by providing additional nutrients.
- **Disease Resistance:** These feeds play a role in building resistance to diseases, supporting the animal's immune system.

37. (a) State six ways in which the knowledge of genetic engineering is useful to a crop breeder. (06marks)

- Creates pest-resistant crops
- Produce fast growing crops
- enhancing nutritional content of plant yields
- produces high yielding crops varieties.
- Produces crops tolerant to herbicides
- Produce draught resistant crops

- Produce disease resistant crops
- Tastier food.

(b) Suggest four negative effects of genetic engineering in crop production (04 marks)

- May cause allergy and other diseases to the people
- Some genetically modified food have low nutrient content
- Some genetically modified lead to antibiotic resistant
- High costs for seed
- Reduction of biodiversity
- Low germination rate for F1 seeds
- Pest resurgence may occur

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**Thanks**

**Dr. Bbosa Science**

#### Before antibiotic

1. Identify cows to be dried off; for, example with stockmarker spray on her leg.
2. Wash arms and hands clean. Wear a fresh pair of disposable gloves and keep clean and dry. Replace gloves frequently, preferably between cows.
3. Pre-dip each teat using a fast-acting disinfectant; leave on for at least 30 seconds.
4. Wipe each teat to be dried off with an individual paper towel, paying particular attention to the teat end. Start with the teats furthest away, moving to the closest teat.
5. Keeping hold of the teat in one hand, wipe the teat and teat end with cotton wool soaked in surgical spirit. Focus on getting the teat end spotless. If there is dirt on the cotton wool after you have cleaned the teat end, repeat with a fresh piece of cotton wool. Do not let go of the teat.
6. Ideally, an assistant should help prepare the tubes and hand them to you. If using internal teat sealant only, proceed to step

#### Antibiotic

7. Using a partial insertion technique, infuse the whole antibiotic tube into the teat. Only insert the tube end and maintain gentle pressure to stop the product leaking around the nozzle. Do not let go of the teat.

8. Without letting go, massage the antibiotic up the teat canal. Slide the hand not holding the tube down the teat after infusing and hold the teat end without touching the teat orifice. This will allow you to massage the contents up towards the udder with your tubing hand.

### Teat sealant

9. When using teat sealant, use the crook of your first finger and thumb to pinch the base of the teat where it joins the udder. The teat will bend towards you. Hold the pinch until the product has been infused into that teat.

10. Gently infuse the teat sealant until pressure builds up in the teat. Remove the teat sealant tube before letting go of the pinch to avoid sealant being forced up into the udder. Do not massage after infusion.

Cleanliness of the teat end is critical when infusing teat sealant.

### After infusion

11. After each teat has been infused with the appropriate product, it should have post-milking teat dip or spray applied.

12. Check that the cow is permanently identified as treated. This reduces the chances of milking a dry cow with antibiotic and causing antibiotic failure.

13. Allow the cow to stand in a clean yard for at least 30 minutes before moving to dry cow accommodation or pasture.

14. In pasture-based systems, avoid recently dried-off cows walking long distances immediately after drying-off.

15. Check udders daily for signs of mastitis.

