



Dr. Blosa Science

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UACE P515/1 Principles and practices of agriculture 2018

SECTION A (30 MARKS)

Write the letter corresponding to the correct answer

- When introducing exotic cattle on a farm the following are required except
 - ensuring that extension services are available in the area
 - having a fence and grazing land
 - rendering the farm stick free by using bait for some time
 - clearing and spraying bushes around the farm
- citrus growers are advised to remove flowers from the trees in the first two years of growth of their crop in order to
 - prevent over bearing of fruits
 - allow branches become strong to bear weight of fruit
 - eliminate citrus pests and diseases that attack flowers
 - improve the quality of fruits.
- One reason why it is not advisable to use paper bags to collect soil samples is because paper bags
 - Conserve heat which kill microorganism
 - Are too weak to carry soil
 - Absorb moisture from the soil
 - Are very expensive to use
- Which of the following is a target organ for oxytocin hormone in mammals?
 - Cowper's gland
 - Mammary glands
 - Adrenal gland
 - ovary
- Which one of the following mineral is lost from the soil through volatilization?
 - Manganese
 - Zinc
 - Magnesium
 - Sulphur
- The reason for using feed additives in animal feed formulation is to increase
 - The nutritive value

- B. The bulk of feed
 - C. Digestibility of the feed
 - D. Utilization of the feeds
7. Which one of the following is a function of consumer co-operative society?
- A. Buying products in bulk and retailing them to members
 - B. Encouraging members to save and later advance loans
 - C. Making inputs available to farmers at fair prices
 - D. Giving a variety of services to their members.
8. Which one of the following is the least important factor when considering which farm tool to buy?
- A. Nature of work to be done
 - B. Financial status of the farmer
 - C. Ease of maintaining the tool
 - D. Ease of using the tool
9. The nutrient requirements of animals are determined by the following except
- A. age of animal
 - B. health of animal
 - C. type of the animal
 - D. climate where the animal lives
10. A building used for processing agricultural produce should have the following requirements except
- A. insulation against temperature
 - B. resistance of walls to vibration
 - C. protection from sunlight
 - D. adequate ventilation
11. Wrought iron is preferred in manufacture of chains because of its
- A. Malleability
 - B. Ductility
 - C. Hardness
 - D. Toughness
12. The predominant flowering plants in neighborhood of a bee hive influences the
- A. timing for the harvesting of honey
 - B. ease with which colonies multiply
 - C. amount of honey produced in the hive
 - D. distinct flavor of the honey
13. Which of the following is not a reason for grafting plant?
- A. Development of new crop variety
 - B. Changing the top of tree crop
 - C. Testing for tolerance to pests and diseases
 - D. Development of quick maturing plants
14. What would be the pressure produced in a hydraulic system if a force of 100N is applied onto a burrel with a cross sectional area of 2cm²?
- A. 200N/cm²
 - B. 0.02N/cm²

- C. $50\text{N}/\text{cm}^2$
 - D. $0.5\text{N}/\text{cm}^2$
15. Agricultural lime is added to a fish pond in order to
- A. disinfect the pond
 - B. fertilize the pond
 - C. control the pH of water in the pond
 - D. prepare fish for harvesting
16. Mulching a pineapple garden using black polythene sheets improves yield by
- A. preventing fruits from touching soil
 - B. increasing microbial activity in the soil
 - C. raising soil temperature
 - D. encouraging formation of suckers
17. Feeding forage to calves is not recommended because
- A. they require proteins rather than carbohydrates
 - B. they have no teeth to chew the cud
 - C. calves only feed on colostrum
 - D. calves do have functional rumen
18. If the price of a bag of maize changed from Shs. 30, 000/= to Shs. 35, 000/= and the supply changed from 1200 to 1600 bags, the price elasticity of supply would be
- A. 2.0
 - B. 4.3
 - C. 16.0
 - D. 33.0
19. Which one of the following practices prolong the life of semen after extraction from a bull?
- A. Adding glucose
 - B. Keeping it in liquid nitrogen
 - C. Diluting it
 - D. Adding antibiotics
20. Pure line breeding is one of the method used for
- A. improving new crop varieties
 - B. improving cross pollinated crops
 - C. improving self-pollinated crops
 - D. carrying out artificial pollination of crops
21. a farmer wants 16% protein ration made from using maize which has 8% proteins and cotton seed cake which has 38% proteins. The percentage of maize to be used in the ration is
- A. 8%
 - B. 27%
 - C. 38%
 - D. 73%
22. Which one of the following refers to settlement?
- A. Reducing population pressure in an area by limiting the number of people settling on it
 - B. Planned transfer of people from one are to another

- C. Transferring people from densely populated area to sparsely populated area
 - D. Transferring people to an area which was previously inhabited.
23. Gender oppression hinders agricultural production through the following except
- A. Denying some individual opportunities available
 - B. Unequal sharing of agricultural resources basing on sex
 - C. Denying some individual s the opportunity to make decision
 - D. Division of labor during production process
24. Which one of the following problems is **not** caused by urban and peri-urban organic farming?
- A. Environmental health risks from inappropriate agricultural practices
 - B. Increased competition for land, water, energy and labor
 - C. Increased food security
 - D. Reduced environmental capacity for pollution absorption
25. The role of microbes in the rumen is to
- A. Produce enzymes for food digestion
 - B. Increase surface area for food digestion
 - C. Activate food absorption
 - D. Provide suitable pH for food digestion
26. Which one of the following is not an outcome of cross breeding in animal improvement?
- A. Grading up animals
 - B. Developing new breeds
 - C. Concentration of genes
 - D. Creation of hybrid vigour
27. /which one of the following is least considered when selecting building material?
- A. Quality and durability
 - B. Skill of the builder
 - C. Cost of material
 - D. Preference of a farmer
28. Which one of the following is an advantage of communal land tenure?
- A. It eliminates land disputes
 - B. It encourages diversification of production
 - C. Production losses are shared by the community
 - D. Production is not limited by land
29. Herbaceous plant is able to stand erect due to the
- A. Presence of cambium
 - B. Wide pith
 - C. Turgor of the cells
 - D. Arrangement of the vascular bundles
30. Which one of the following is not recommended in soil sampling?
- A. Clearing vegetation from selected site
 - B. Collecting soil samples from under trees
 - C. Collecting soil sample from several holes in a transverse pattern
 - D. Collecting soil samples from a depth of more than 25cm

SECTION B

Answer all questions

31. (a) Outline **five** ways in which urban and peri-urban farming is beneficial (05marks)
(b) Give **five** challenges of urban and peri-urban farming (05marks)
32. (a) What is meant by mechanical advantage as applied to simple machines (01mark)
(b)(i) If a lever is used to overcome a load of 50N by applying an effort of 10N, what would be its mechanical advantage? (02marks)
(ii) Explain why the mechanical advantage is greater than 1 (01mark)
(c) Figure 1 represent an inclined plane used to load coffee bags a on to a lorry. Study it and answer the questions that follow.

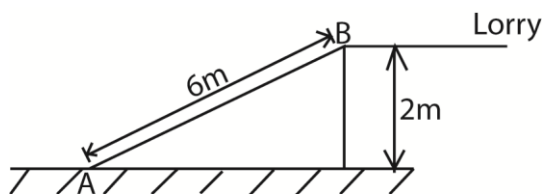


Fig. 1

- (i) Describe how a coffee bag on the ground at point A can be loaded onto a lorry at point B (04mark)
- (ii) If the length of the plane is 6m and height of the lorry from the point of lorry from the point of loading is 2m, what will be the velocity ration for loading? (02marks)
33. (a) Outline four conditions met while choosing a site for a fish pond. (04marks)
(b) State **four** characteristics of a good fish pond. (04marks)
34. (a) States **six** challenges that agricultural development faces in Uganda. (06marks)
(b) Give **four** ways in which the National Agricultural advisory service has contributed to the development of agriculture in Uganda. (04marks)
35. (a) What is genetic engineering? (02marks)
(b) Explain **three** benefits of genetic engineering in agriculture (03marks)
(c) Outline **five** challenges of genetic engineering in agriculture. (05marks)
36. (a) State **four** causes of swarming in bees. (04marks)
(b) Suggest **four** precautions that should be taken when harvesting honey (04marks)
(c) Give **two** methods of encouraging high yields of honey in bee hives (02marks)
37. (a) Give five types of damage which may occur on grains in store (05marks)
(b) State five characteristics of a good store for grains. (05marks)

Suggested answers

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

Comments

4. Oxytocin acts on mammary glands allowing milk to be let down from the mammary glands in the mother's breast

5. Sulphur reacts with oxygen to form gaseous SO₂

11. Ductility is a critical mechanical performance indicator, particularly in applications that require materials to bend, stretch, or deform in other ways without breaking.

12. The flavor of honey depends on the type of flowers **within roughly 2 miles of the hive that produces it**. This is because Honey Bees have an average foraging radius of two miles, and the type of flower the bees gather nectar from directly influences both the flavor and color of the honey they produce.

14. $Pressure = \frac{Force}{Area} = \frac{100}{2} = 50N/cm^2$

16. Plastic mulch (especially black) will help reduce/eliminate weed growth under the plastic film through light exclusion. Plastic mulch will maintain a higher soil moisture level by reducing/eliminating evaporation from the soil surface which increase microbial activity.

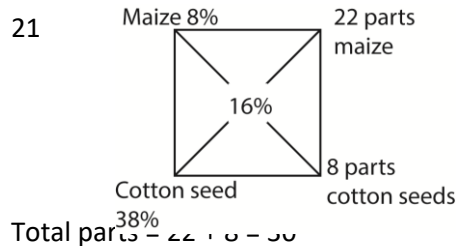
18. $Percentage\ change\ in\ supply = \frac{1600-1200}{1200} \times 100 = 33.33\%$

$Percentage\ change\ in\ price = \frac{35000-30000}{30000} \times 100 = 16.67\%$

$Price\ elasticity\ of\ supply = \frac{percentage\ change\ in\ supply}{percentage\ in\ price} = \frac{33.33}{16.67} = 2$

19. Keeping it in liquid nitrogen means freezing it

20. **Line breeding is a form of** selective breeding that involves mating individuals within the same family line, **but with a greater degree of genetic diversity compared to inbreeding**



$$\text{Proportion of maize} = \frac{22}{30} \times 100 = 73\%$$

SECTION B

31. (a) Outline five ways in which urban and peri-urban farming is beneficial (05marks)

- Poverty reduction through creating low cost employment to the farmers.
- Waste recycling.
- Food security and nutrition i.e. there is production of highly nutritious crops.
- Creation of employment
- Government revenue
- There are reduced transportation and storage costs of produce.
- It encourages good use of marginal areas like verandah and compound.

(b) Give five challenges of urban and peri-urban farming (05marks)

- Some crops such as maize are breeding ground for vectors such as mosquitoes.
- Limited land
- Raising livestock in the city leads air pollution
- High labor costs.
- Encroachment on swamps
- High risk of theft
- High risk of disease transmission from animals to people.
- Limited research.

32. (a) What is meant by mechanical advantage as applied to simple machines (01mark)

Mechanical advantage is the ratio of the load to effort

(b)(i) If a lever is used to overcome a load of 50N by applying an effort of 10N, what would be its mechanical advantage? (02marks)

$$\text{Mechanical advantage} = \frac{50}{10} = 5$$

(ii) Explain why the mechanical advantage is greater than 1 (01mark)

Because the load is always greater than the effort

(c) Figure 1 represent an inclined plane used to load coffee bags a on to a lorry. Study it and answer the questions that follow.

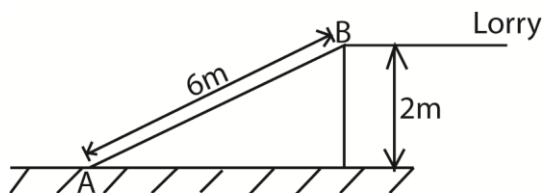


Fig. 1

(iii) Describe how a coffee bag on the ground at point A can be loaded onto a lorry at point B (04mark)

The load is pushed with less effort along the inclined plane AB rather than lifting it up through the height (2m)

- (iv) If the length of the plane is 6m and height of the lorry from the point of lorry from the point of loading is 2m, what will be the velocity ration for loading? (02marks)

$$\text{Velocity ration} = \frac{\text{length of inclined plane}}{\text{heigh of inclined plane}} = \frac{6}{2} = 3$$

33. (a) Outline four conditions met while choosing a site for a fish pond. (06marks)

- The topography of the site should be gently sloping to allow the pond to be filled and drained easily under natural gravity
- The soil water holding capacity and water the water table should be high to hold water in the pond for a long time without draining away
- The water source should be stable/permanent to provide water to the pond
- It should readily accessible for monitoring
- There should security
- Should be free from pollution
- Should be of adequate size
- Should be free from human interference.

- (b) State **four** characteristics of a good fish pond. (04marks)

- Permanent /reliable water source throughout the year
- Pond walls or dykes to hold the water in the pond.
- Water controls to manage water level and flow.
- Tracks and roadways along the pond wall for easy access.
- Harvesting facilities and other equipment for water and fish management.
- Security
- Access to market

- (c) Giving a reason, suggest the type of fish which is more suited to rear in areas which are likely to suffer from water shortage (02marks)

Lung fish, and catfish can survive in mud for along time

34. (a) States six challenges that agricultural development faces in Uganda. (06marks)

- Low and unreliable rainfall such as in in northern and north-eastern Uganda limits growth of crops and pastures for the animals
- Rugged relief or steep landscape for example in Kasese and Kigezi discourage agricultural mechanization
- Poor drainage such as floods destroy crops and animals
- Occurrence of pests and diseases that destroy crops and infect animals

- Poor quality crop and animal varieties e.g. Zebu cattle in Karamoja region
- Poor land tenure system limits effective use of land
- Rural-urban migration Uganda have led to scarcity of labor on farms
- Political instability in some parts of the country discourages investment in agriculture.
- Inadequate capital to purchase farm inputs
- Inadequate market for agricultural produce
- Cultural and religious constraint that limit farming e.g. rearing pigs by Muslims
- Inadequate storage and preservation facilities lead to post harvest losses
- Poor transport networks to market centres lead to losses
- Inadequate skilled labour in form of extension workers and veterinary doctors to stimulate agricultural modernization
- Corruption and embezzlement of agricultural funds for modernization of agriculture.
- Poor technology

(b) Give four ways in which the National Agricultural advisory service has contributed to the development of agriculture in Uganda. (04marks)

- They train and educate farmers on modern farming practices to boost agricultural productivity.
- Train farmers on agribusiness techniques such as book keeping
- They encourage people in farming business to improve rural livelihoods
- They empower rural communities on their social economic and health aspects such as HIV prevention.
- They improve nutrition and household income through increased productivity and market oriented farming.
- Promote agricultural innovations
- Empower marginalized groups in agriculture such women and youth to access and utilize agricultural resources.
- Promote cooperation of farmers
- Provide agricultural advisory services.

35. (a) What is genetic engineering? (02marks)

Genetic engineering refers to the artificial manipulation of DNA to alter an organism's characteristics in a particular way.

(b) Explain three benefits of genetic engineering in agriculture (03marks)

- 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

(c) Outline five challenges of genetic engineering in agriculture. (05marks)

- Loss of nutritional value of foods
- Low rate of seed germination
- Produce cause allergies and diseases
- It can lead to more birth defects.
- Immune suppression
- Antibiotic resistance
- Environmental concerns

36. (a) State **four** causes of swarming in bees. (04marks)

- Overcrowding when there is no enough room to build enough honey store
- The temperature is too hot. With higher temperatures, more space is needed for each bee to maintain a cooler temperature.
- The hive does not have proper ventilation and drainage.
- Outbreak of pests like mites
- Sick and infertile queen
- Strong bad odor can chase away bees

(b) Suggest **four** precautions that should be taken when harvesting honey (04marks)

- Harvest when the honey is ready i.e. smell of honey, when bees are more aggressive than usual
- Provide protective clothing: Wear a long-sleeved shirt, gloves, long pants, and closed-toe shoes to protect your skin.
- Do not harvest during rain because water dilutes the honey
- Use suitable smoker
- Remove dirt from honey
- Avoid propolis and too much pollen in honey

(c) Give **two** methods of encouraging high yields of honey in bee hives (02marks)

- Providing source of water
- Growing flowering plants around the apiary

37. (a) Give five types of damage which may occur on grains in store (05marks)

- **Broken or Cracked Kernels**
- Discoloration due to excessive heat
- Insect infestation such as weevils
- Bacteria, yeasts and mould attack stored grains and cause their rotting due to high humidity.
- loss of weight,
- bad odor due to rotting
- aflatoxin contamination of grains.

(b) State five characteristics of a good store for grains. (05marks)

- Should well ventilated for proper aeration
- Should be lockable for security
- Should be fire proof.
- Should be protected from pests
- Should have leak free roof to keep inside dry
- Should have concrete floor to minimize dust
- Should have enough light.

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Thanks

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