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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

- One advantage of urban farming is that
  - the cost of production is low
  - products are packed before sale
  - there is access to consumer markets
  - farmers earn much income from it
- Dried mushrooms are packed in sealed containers in order to
  - prevent absorption of moisture
  - maintain flavor
  - to control storage pests
  - prevent loss of nutrient
- Which one of the following metabolic disorders likely to occur in high yielding cattle feed on lush grass only?
  - Ketosis
  - Grass tetany
  - Pica
  - Milk fever
- Which one of the following stages of a production function shows optimum utilization of an input factor?
  - Constant returns
  - Increasing returns
  - Negative returns
  - Diminishing returns
- The resistance of a barbed wire to force pulling it a part when strained on a fence post represent its
  - Tensile force
  - Compression strength
  - Shearing strength
  - Elastic strength
- When a bag of maize weighing 80kg is lifted through a distance of 1.5m, the work done is

- A. 120J
  - B. 53.3J
  - C. 1200J
  - D. 12J
7. Which one of the following is an advantage of using farm yard manure over inorganic fertilizers?
- Farm yard manure
- A. Contains more nutrients
  - B. Adds organic matter which improves on soil structure
  - C. Does not alter pH
  - D. Supplies all the micro-nutrients required by the plant
8. It is not advisable to use paper bags to collect soil samples for laboratory analysis because they
- A. React chemically with the soil minerals
  - B. Cannot carry large soil samples
  - C. Generate heat that may kill microbes
  - D. Absorb moisture from the soil
9. Production of shell-less eggs by layers maybe prevented by
- A. Vaccination
  - B. Giving fish meal to layers
  - C. Supplying layers with greens
  - D. Increasing light in the laying house
10. It is easier to compact legume than cereals because legumes
- A. have a high carbon to nitrogen ratio
  - B. are more succulent than cereals
  - C. have a small carbon to nitrogen ratio
  - D. have a high nitrogen content
11. Manure is added to a fish pond two weeks prior to stocking in order to
- A. provide materials for breeding nest
  - B. provide food for fingerlings
  - C. encourage growth of algae and other water plants
  - D. give pond water a dark color to protect fish
12. Which one of the following is an advantage of the embryo transfer technology in animal breeding?
- A. Increased hybrid vigour
  - B. Eliminates undesirable traits from a herd
  - C. Allows a farmer to choose between male and female offspring
  - D. Eliminates free martins in a herd
13. The purpose of uniting two bee colonies in bee management is to
- A. have more drones in a hive for mating
  - B. form a strong colony that can defend the hive
  - C. form a colony that produces more honey
  - D. have more productive queens in the hive.
14. Which one of the following takes place during the dark stage of photosynthesis?
- A. Oxygen is given off as a by-product

- B. Carbon dioxide combines with Ribulose biphosphate
  - C. Water molecule are split
  - D. Electrons are emitted from chlorophyll molecules
15. Frequent use of pesticides like DDT in an ecosystem is discouraged because it
- A. accumulates in consumer tissues
  - B. causes migration of beneficial organisms from the area
  - C. leads to emergence of secondary pests in the area
  - D. is too strong and cannot be diluted enough
16. The management practice that ensures high litter size in pig rearing is
- A. timely servicing
  - B. early weaning
  - C. proper housing
  - D. flushing sows
17. Phosphatic fertilizers are normally applied at planting time because they
- A. do not scotch the seedlings
  - B. promote leafy growth
  - C. are required for seed germination
  - D. promote root growth
18. Light intensity affects the rate of transpiration by
- A. influencing opening and closing of the stomata
  - B. affecting air movement around the leaf surface
  - C. providing energy necessary for transpiration
  - D. providing energy which accelerated evaporation
19. Which of the following organisms contribute to mechanical binding of soil particles in the field?
- A. Bacteria
  - B. Fungi
  - C. Earthworm
  - D. protozoa
20. In a test cross, a tall organism is proved to be heterozygous for tallness if it produces
- A. Tall and dwarf offspring
  - B. Tall offspring only
  - C. Only dwarf offspring
  - D. Offspring of intermediate height
21. Which one of the following would be the most appropriate use of long term credit?
- A. Buying seeds form planting
  - B. Repairing broken structures
  - C. Buying agricultural implements
  - D. Paying salaries
22. The major reason for grooming dairy cattle is to
- A. facilitate clean milk production
  - B. facilitate mating
  - C. keep the skin soft

- D. facilitate blood circulation
23. Which one of the following would be most effective in controlling viral diseases in livestock?
- A. Antibiotics
  - B. Vaccines
  - C. Anthelmintics
  - D. analgesics
24. Concrete can be reinforced to increase its strength by
- A. using 1 part cement, 2 parts sand and 3 parts aggregate
  - B. putting steel bars in the concrete
  - C. using just enough water to mix concrete contents
  - D. finishing with a coat of wetted cement
25. Which one of the following is not likely to occur when there is excess supply of feeds in a fish pond?
- A. Wastage of feeds
  - B. Development of foul smell
  - C. Over fattening of fish
  - D. Abundance of phytoplankton
26. When selecting a tree species to be grown for timber, the most important consideration is
- A. disease resistance
  - B. early maturity
  - C. narrow crown
  - D. straight growth
27. Which one of the following is a feature of resettlement? It involves
- A. a planned transfer of a population from one area to another
  - B. a process of transferring people from a more populated area to a sparsely populated area
  - C. a transfer of people to an area that has not been previously inhabited
  - D. relieving population pressure from an area by reducing the number of people settled on it.
28. A disadvantage of sub surface drain is that it
- A. leads to silting up
  - B. interferes with mechanical tillage operations
  - C. takes up good land for crops
  - D. leads to excessive leaching
29. Which one of the following distinguishes subsidies from loan?
- A. Subsidies are not repaid from farmers but loans are.
  - B. Loans are given in form of liquid cash but subsidies are physical items
  - C. Subsidies are normally small in nature but loans are usually big sums
  - D. Subsidies are given against a collateral while loans are not
30. Which one of the following has the least effect on urban farming
- A. The structure of the urban population
  - B. The quality of available water
  - C. Land tenure conditions
  - D. The potential for irrigation

## SECTION B

Answer all questions

31. (a) Define agro forestry (01marks)  
(b) Describe three types of agro forestry commonly carried out by farmers. (03marks)  
(c) Give six characteristics of agro forestry trees. (06marks)
32. (a) What is meant by efficiency of a machine used to do work? (02marks)  
(b) A machine requires 6250kJ of energy to lift a bag of maize weighing 50kg through a vertical height of 10m. Calculate  
(i) work done by the machine (03marks) (answer 5000J)  
(ii) Efficiency of the machine (03marks) (ans. 80%)  
(c) State two ways of improving the efficiency of a machine
33. (a) Distinguish between a systemic and non-systemic herbicide  
(b) Explain four factors which influence the selection of a herbicide  
(c) Mention four ways in which the effectiveness of a herbicide can be achieved.
34. (a) Explain the following terms as used in animal nutrition  
(i) Digestibility (01mark)  
(ii) Digestible energy (01mark)  
(iii) Crude proteins (01mark)  
(b) Give **four** characteristics of concentrate feeds (04marks)  
(c) State **one** method of controlling each of the following nutritional disorders in farm animals (03marks)  
(i) Bloat  
(ii) Milk fever  
(iii) Piglet anemia
35. (a) Suggest **six** challenges faced by a farmer who owns fragmented land (05marks)  
(b) Outline **four** benefits of having a land title to a farmer (04marks)
36. (a) What is meant by polyploidy? (02marks)  
(b) Give four ways in which polyploidy conditions affect the quality of crops. (04marks)  
(c) Give four reasons why grafting is important in crop production (04marks)
- 37.

### Suggested answers

1C    4A    7A    10B    13B    16D    19C    22A    25C    28A  
2B    5A    8D    11C    14B    17D    20A    23B    26D    29A

3B 6C 9B 12C 15A 18A 21C 24B 27B 30C

Comments

3. Lush grass lack magnesium: Classic “grass tetany” is a rapidly progressing and potentially fatal disorder caused by low magnesium level in the blood, also known as “hypomagnesemia”. It is usually seen in older, lactating beef cows when grazing young, succulent grass in early spring, particularly during cool and rainy weather

4.  $W = F \times d$

$$= 80 \times 10 \times 1.5 = 1200J$$

9. fish meal contains calcium

16. Flushing sows is a feeding strategy that ensures reproductive success. It involves of overfeeding sows for one or two weeks prior to the insemination to optimize the ovulation leading increase the number, size and reduce mortality of piglets per sow.

The mechanism of action underlying the Flushing technique consists of increased secretion of follicle stimulating hormone (FSH) and increased frequency of luteinizing hormone (LH) pulses, which stimulate the quality (size and uniformity) and number of oocytes.

The Flushing diet should contain not only a greater energy intake, but also a greater number of vitamins and minerals, such as Vit. A Vit E, Vit. 12, cobalt and Chromium, as they have shown to have a positive effect on reproduction.

19. Earthworms liberate mucus that binds soil particles

## SECTION B

31. (a) Define agroforestry

It is a farming system in which farmers deliberately plant multiple trees together with crops or pastures on the same land.

(b) Describe three types of agroforestry practices commonly carried out by farmers.

- Agro-Aquaculture where the keeping of aquatic organism like fish in ponds surrounded by shrubs, trees and grass lawns.
- Agri-silviculture system where cultivated crops are intercropped with trees/shrubs for sustained production of food, fodder and wood.
- Agri-silvi-pastoral system where there is the integration of trees, crops, pasture and livestock on the same land for production of fodder, wood and pasture.
- Entomoforestry where the rearing of useful insects in association with trees, such as bee keeping (apiculture) and silkworm rearing (sericulture)

- Silvo-pastoral system where trees are planted with pasture to provide shade and forage for animals.

(c) Give six characteristics of agroforestry

- They are quick maturing/grow fast
- They are deep rooted with few extensive lateral roots/have deep root system
- They have a narrow /less dense canopy
- They should grow straight with few or no branches
- They are easy to establish and quick to eradicate
- They withstand repeated pruning/are able to sprout easily and quickly grow
- They are nutritious and palatable to livestock/non-toxic
- They are resistant to pest and diseases
- They support growth of crops; some possess nitrogen fixing bacteria.

32. (a) What is meant by efficiency of a machine used to do work? (02marks)

It is the ratio of work output to input of a machine

(b) A machine requires 6250kJ of energy to lift a bag of maize weighing 50kg through a vertical height of 10m. Calculate

(i) Work done by the machine (03marks)

Work done = force x distance

$$= 50 \times 10 \times 10 = 5000\text{J}$$

(ii) Efficiency of the machine (03marks)

$$\text{Efficiency} = \frac{\text{work output}}{\text{work input}} \times 100\% = \frac{5000}{6250} \times 100 = 80\%$$

(c) State two ways of improving the efficiency of a machine

- Working the machine with recommended load
- Using the machine for recommended purpose
- Regular maintenance of the machine
- Lubricating bolts and joints

33. (a) Distinguish between a systemic and non-systemic herbicide

A systemic herbicide is that which is absorbed and translocated or transported throughout the whole plants to kill it, whereas, a non-systemic herbicide is that which does not to be translocated to the whole plant in order to kill it

(b) Explain **four** factors which influence the selection of a herbicide

- Cost/price of herbicide; farmers prefer herbicides that are cheap
- Effectiveness farmers prefer a herbicide that is effective against the weeds
- Selectiveness of the herbicide; farmers select those herbicide that are selective especially when weeding
- The age/stage of growth of weed determines the effectiveness of a herbicide

- A farmer selects a herbicide based on previous results or familiarity
- Expiry date of herbicide; farmers prefer herbicides with long expiry date
- Farmer preference and choice

(c) Mention **four** ways in which the effectiveness of a herbicide can be achieved.

- Use of the right herbicide for the right weed
- Applying the herbicides in right quantities and intervals/mixing herbicides according to manufacturers instructions
- Ensuring proper wetting of the leaves
- Apply the herbicides after the dew has dried to prevent dilution
- Apply the herbicide at the correct stage of the weed. Especially old weeds tend to resist herbicides
- Avoid spraying in windy weather to prevent drift i.e. the spray to follow the direction of wind

34. (a) Explain the following terms as used in animal nutrition

(i) Digestibility

It is the proportion of the feed absorbed by the animal's body or the difference between the amount of feed ingested and amount of feces produced

(ii) Digestible energy

This is the portion of the total carbohydrate contained in the feed which an animal is capable of utilizing or the amount of energy in the feed minus the energy lost in feces.

(iii) Crude proteins

This is the sum of total nitrogenous compounds contained in a feed.

(iv) Production ratio

It is the amount of feed an animal needs to produce products such as milk, meat, eggs and offspring in addition to the maintenance ration required for basic functions.

(v) Digestible crude proteins (DCP)

It is the amount of proteins which can be digested or it is a measure of nitrogen in the feed consumed that is retained in the body of an animal after subtracting losses through feces.

(vi) Starch Equivalent (SE)

This is the measure of energy requirement which an animal can obtain from the food. Or it is the amount of pure starch which has the same energy as 100kg of a feed

(b) Give the characteristics of concentrate feeds

- have low crude fiber content
- have high protein and carbohydrate contents
- are highly palatable to animals
- have high digestibility
- mainly derived from grain and their byproducts
- have low moisture contents
- have fairly constant food value

(c) State one method of controlling each of the following nutritional disorders in farm animals

(i) Bloat

- control the amount of succulent feeds and younger pastures fed to the animals
- carry out drench using any vegetable oil
- use stomach tube to release gas from the stomach
- drenching using anti-bloat drugs, cooking oil or beer to stop production of acids
- use of trocar or cannula to puncture the lumen to allow escape of gases
- exercising the animal
- Use of broom stick method i.e. wooden rod is inserted across the mouth to keep the mouth open to allow escape of gases from the rumen
- avoid giving the animal cassava, excess grain and protein concentrate

(ii) Milk fever

- intravenous or subcutaneous injection of calcium gluconate
- giving calcium, vitamin D and phosphate supplements

(iv) Piglet anemia

- Give mineral supplements rich in iron

35. (a) Suggest **six** challenges faced by a farmer who owns fragmented land (05marks)

- It's difficult to supervise all plots effectively.
- Large scale/commercial farming is not possible
- Farmers fail to secure land title deeds.
- Farmers fail to access social services such as road, water for irrigation etc.
- Farm planning is difficult due to the small size of the fragments.
- It encourages low agriculture production.
- Theft of farm produce is common due to reduced supervision.
- Agricultural mechanization is expensive due to the small size of the plots which are scattered.
- It's difficult to offer agricultural extension services on such scattered plots.
- It's difficult to carry out soil conservation measures due to the distance involved.
- Pest and disease control on the fragments is difficult.
- It's difficult to control grazing since farmers have small plots that are prone to overstocking and overgrazing.

(b) Outline **four** benefits of having a land title to a farmer (04marks)

- The land owner has security of tenure hence can develop the land.
- He can use the land title to obtain loans.
- Land owner can easily rent out land to get extra income.
- It minimizes land disputes because of proper land demarcation
- It encourages land development through establishment of perennial crops
- Land owner is encouraged to carryout soil conservation measures in order to protect his land.
- It is easy to sale or transfer the ownership of land.

36. (a) What is meant by a polyploidy? (02marks)

It is an organism containing more than two homologous sets of chromosomes in its cells

(b) Give four ways in which polyploidy conditions affects the quality of crops. (04marks)

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

(c) Give four reasons why grafting is important in crop production (04marks)

- It changes the tree top from being undesirable to desirable
- It makes it possible to grow more than one fruit or flower in the same plant.
- Root stocks with desirable character like disease resistance, problem of water logging are used which may be beneficial to the scion and farmer.
- It helps to propagate clones that cannot be propagated by any means.
- It helps propagating special plants form e.g. seedless oranges.
- Helps in change variety for more especially when the acid
- Virus indexing – Plants having viral infection with no signs will show signs when grafted.

37. (a) State six factors to be considered when selecting a site for 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) Give four management practices carried out in a fish pond (04marks)

- Pond stocking
- Pond cleaning
- Pond repair
- Pest and disease control
- Fish feeding
- Water refilling
- Fish sampling
- Fish harvesting and marketing

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