CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZ- JES)
AGRICULTURE 3 (PRACTICAL)

MARKING SCHEME

QUESTION 1:

(a) (I)

Sample	**Red litmus**	**Blue litmus**
A	Red litmus retainit's colour	Blue litmus change to red
B	Red litmus retainit's colour	Blue litmus change to red

(2 Marks)

(ii) To identify different type of fertilizers that the farmer can use in crop production. To know which fertilizer is used for vegetative growth or root formation and development in crops (To know at what crop growth stage is each type of fertilizer applied to crops). (1 Mark)

(iii)

Fertilizer Sample	**Fertilizer name**	**Colour**	**Formulation**	**pH**
A	Urea	White	Granular	Very Acidic
B	DAP(Di-Ammonium Phosphate)	Grey	Granular	Acidic

(3 Marks)

b) (i)

Solution

Data given

Formula

Amount/ Quantity of fertilizer required (Q)= $\frac{\text{Area (A) x Recommended Application Rate (R)}}{\text{\% Fertilizer Grade (FG)}}$

Where

Q= ?

A= 4 Hectares

R= Recommended rate of Application= 80Kg Nitrogen

FG= 20% Nitrogen of Sulphate of Ammonium (SA)

Then, From the above formula

20% N= 20Kg N which is supplied by 100kg of SA,

Q= $\frac{A \times R}{\% FG} = \frac{4 \times 80}{20/100}$ = 1600kg of SA

Therefore the amount of sulphate of Ammonium required to Supply 80 kg Nitrogen is 1600kg

(ii) How much would a farmer pay to apply S.A fertilizer on 4 Hectares?

Solution

Data given

50kg S.A cost = 1500 Tsh

1600kg S.A cost= ????

Then, X=. $\frac{\text{1600kg S.A x 1500 Tsh}}{\text{50kg S.A}}$

X=TSh 48,000/=

Therefore the cost that farmer pay to buy S.A for 4 Hectares is Tsh 48,000/=

c) Which of the two fertilizers would be cheaper to apply in order to Supply 160kg of N?

Solution

Data given

Area= 1 Hectare

Recommended rate= 160kg N

Fertilizer Grade (FG) = 20%N

Quantity (Q) =????

Remember, Formula

20kg N is supplied by 100kg CAN

160 kgN. = ??????? X of CAN

X of CAN= $\frac{\text{160kg CAN x 100kg CAN}}{\text{20 Kg N}}$

= **800Kg of CAN**

Alternative

Quantity of CAN required (Q) = $\frac{\text{A x R}}{\%\text{FG.}}$ =. $\frac{\text{1hax160 Kg N}}{20/100}$ =. **800Kg CAN (1 Mark)**

Also,

A= 1 ha, Rate= 160 kg, FG=25%

Quantity of ASN (Q) =$\frac{\text{Area x Rate}}{\%\text{FG.}}$ = $\frac{\text{1ha x 160kg N}}{25/100}$ =. **640 kg ASN. (1 Marks)**

But,

50 kg CAN cost = Tsh 1600/=

800kg CAN cost = ???? X

X= $\frac{\text{800kg CAN x 1600 Tsh.}}{\text{50kg CAN}}$ =. **Tsh 25,600/= (1 Mark)**

Also,

50kg ASN cost = 1800/=

640 kg ASN cost= ??? X

X = $\frac{\text{640 Kg ASN x 1800 Tsh}}{\text{50kg ASN}}$ =. **Tsh 23,040/=. (1 Mark)**

Then ,Find difference between Cost of Calcium Ammonium Nitrate (CAN)and Ammonium sulphate Nitrate (ASN)

CAN(25,600/=) - ASN (23,040/=/) =. **Tsh 2,560/=**

Therefore Applying ASN is cheaper than applying CAN by Tsh 2,560/=.(1 Mark)

d) The following important key benefits that farmers get from the Fertilizer subsidies prices:

- Lower Production Costs – Subsidies reduce the price of fertilizers, allowing farmers to spend less on inputs and allocate funds to other essential farming needs.
- Increased Crop Yields – With affordable fertilizers, farmers can apply the right nutrients to their crops, leading to better soil fertility and higher agricultural productivity.
- Improved Food Security – Higher crop yields mean more food production, which helps ensure a stable food supply and reduces the risk of shortages.
- Higher Farm Income – When farmers produce more crops at a lower cost, they can sell more and increase their profits, improving their overall livelihood.
- Encouragement of Sustainable Farming – Affordable fertilizers encourage farmers to adopt better soil management practices, leading to long-term agricultural sustainability

(Any three points 1Mark @ = 3 Marks)

QUESTION 2:

(i) Groups of Animal parasites

✓ External parasites: Are the group of animal parasites that affects external body parts of the animals . While sucking blood from animal they transmit diseases eg Tsetse flies (Specimen F) and Ticks - Specimen G **(1 Mark)**

✓ Internal Parasites: Are the group of animal parasites that affects Internal parts or organs of the animal body . Example Liver **flukes (1 Mark)**

(ii) Effects of Tsetse flies (Specimen F) to livestock keepers

✓Disease Transmission – Tsetse flies spread trypanosomiasis, which weakens and kills cattle, reducing herd productivity.

✓Reduced Livestock Productivity – Infected animals suffer from weight loss, reduced milk production, and infertility, affecting the livelihoods of farmers.

✓High Treatment Costs – Managing and treating trypanosomiasis is expensive and often inaccessible in remote areas.

✓Limitations on Grazing Areas – Farmers avoid infested areas, reducing the availability of pasture and forcing them to keep fewer animals.

✓Economic Losses – Frequent livestock deaths lead to financial hardship, making it difficult for farmers to sustain their businesses. **(Any four points 1 Mark @ =4 Marks)**

(iii)Here are the four best methods of ticks (Specimen G) control in livestocks: (4 marks)

1. Chemical Control (Acaricides)

✓Dipping: Immerse animals in a tick-control solution (common in large-scale farms).

✓Spraying: Use hand or machine sprayers to apply acaricides.

✓Injectables: Some drugs (e.g., ivermectin) help kill ticks from within.

2. Biological Control

✓Introduce natural tick predators like certain birds (e.g., guinea fowl) and parasitic wasps.

3. Pasture Management

✓Rotational grazing: Move animals between paddocks to break the tick life cycle.

✓Controlled burning: In some areas, burning dry grass kills ticks and their eggs.

4. Regular Inspection and Manual Removal

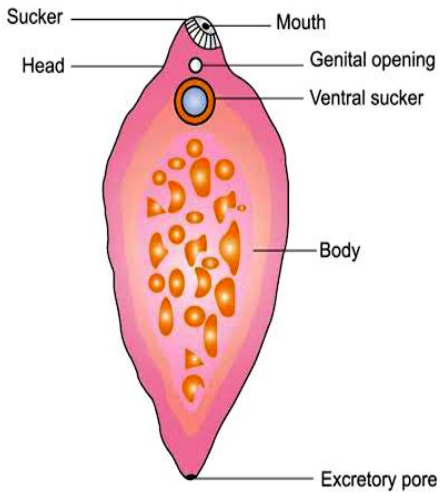
✓Inspect animals regularly, especially around the ears, tail, and underbelly.

✓Physically remove ticks using tweezers and disinfect the area.

(iv) As a livestock veterinary officer with knowledge of animal parasites, you would find Liver Flukes (Fasciola spp.) in the liver, specifically in the bile ducts of the animal. During post-mortem examination after slaughter, you should inspect the liver for Enlarged or swollen bile ducts that indicates presence of flukes **(2 Marks)**

(V) Well labeled Diagram of liver flukes **(3 marks)**

Fasciola Hepatika



QUESTION 3:

(i)

Specimen	Common name	Botanical name
J	Maize weevils	*Sitophilus zeamais*
K	Rodent	*Rattus rattus*

($\frac{1}{2}$ mark @ = 2 Marks)

(ii) Modern improved methods of controlling storage pests

- Use of silo: Air tight storage condition that will not allow survival of weevils if they get inside the storage facilities
- Godwons(ware house): confined room where chemical spray is easy to protect storage pests
- Use of Bins- Aluminum galvanized steel
- Cold rooms ,: Where storage pests can manage to stay **($\frac{1}{2}$mark @ = 2 Marks)**

(iii) Four major attributes that makes Specimen K(Rodents) very successful group of storage pests

- Adaptability under wide variety of Environmental conditions eg. In absence of water can use metabolic water from the food.
- Body size: Small body size make them hide easily from predators, also need small amount of daily food intake
- High rate of reproduction (Fecundity): They reproduce very fast within a short time and give birth to big litters eg. 12-24 youngs/ per birth.
- Feed entirely on all feed stuffs **(4 Marks)**

(iv) How do you distinguish storage pests from field pests with one example in each

Storage pests: Are those pests that attack crops in the store eg. Maize weevils and Rats while
Field pests: Are those pests that attack crops in the field eg. Maize stalk borers caterpillars etc.
(2 Marks)

(v) Possible Solutions To prevent or mitigate the effects of low maize production, Tanzania can:

- Improve irrigation and climate resilience to reduce dependence on rainfall.
- Encourage crop diversification to reduce reliance on maize.
- Strengthen pest and disease control to protect maize yields.
- Invest in storage facilities to minimize post-harvest losses.
- Promote research and better farming practices to increase productivity.

(Any 5 points 1 Mark @= 5 Marks)