JINJA JOINT EXAMINATIONS BOARD

MOCK EXAMINATIONS 2022

PRINCIPLES AND PRACTICES OF AGRICULTURE

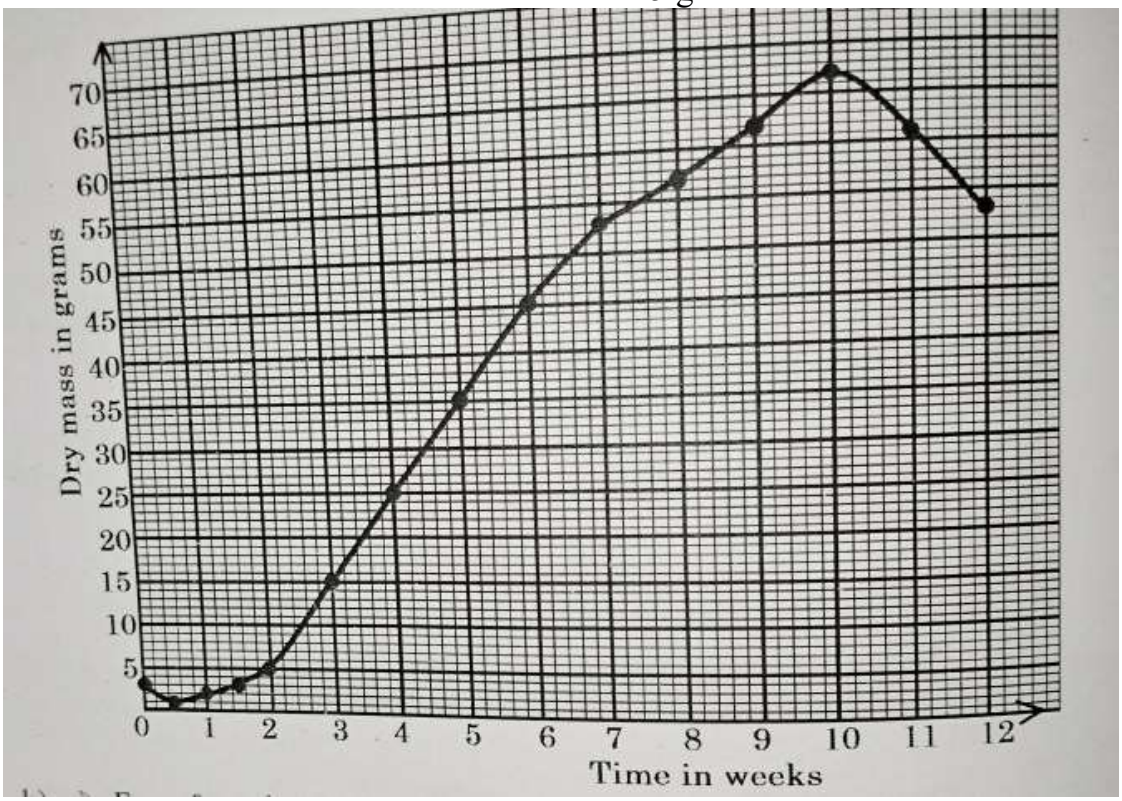
P515/2

MARKING GUIDE

1. A graph showing the variation of dry mass of pea plant with time.

Scale: Horizontal axis: 1cm = 1 week

Vertical axis: 1cm = 5 grams



(b)

- ✓ From 0 week to 0.5 week the dry mass decreases gradually;
- ✓ From 0.5 week to 2 weeks the dry mass increases gradually;
- ✓ From 2 weeks to 10 weeks the dry mass increases rapidly;
- ✓ From 10 weeks to 12 weeks, the dry mass decreases rapidly

A word 1 mark for 4 points

1X4 = 4marks

(c) From 0 week to 0.5 week, the dry mass decreases rapidly; food reserves in cotyledon of a pea seed was broken down and oxidized; to release energy for germination.

- ✓ From 0.5 week to 2 weeks, the dry mass increases gradually because the seedling had formed the first leaves which had started to photosynthesizing food; for rapid cells division/growth;
- ✓ From 2 weeks to 10 weeks, the dry mass increases rapidly because the pea plant has developed numerous leaves; so high rate of photosynthesis and so more rapid cell division/growth. In addition, the pea plant had developed flowers and fruits; in which most synthesized food is stored;
- ✓ From 10 weeks to 12 weeks, the dry mass decreases rapidly because the fruits had matured, dried and were dispersed away; In addition, the plant had reached maturity; and the rate of cell division is very low; so more cells were dying and the plant gradually dried.

A word 1 mark for 4 points

1X4 = 4marks

d) (i) **Roles of water during germination:**

- ✓ To dissolve and hydrolyse stored food in cotyledon or endosperm;
- ✓ To activate enzymes in the seed;
- ✓ To provide necessary medium for enzymes activity;
- ✓ To act as a medium for transport of dissolved food substances to various parts of the developing embryo.
- ✓ Makes the seed swollen, testa soften and bursts to allow radical and plumule grow outward.

A word 1 mark for 3 points

1X3 = 3marks

(ii) **Roles of temperature during germination:**

- ✓ Temperature affects the enzymes activities involved in germination;
- ✓ Germination occurs at optimum temperature (25 ^{o}c) as enzymes are very active;
- ✓ At extreme temperature, enzymes are inactive; and at very temperatures, the enzymes are denatured;

A word 1 mark for 3 points

1X3 = 3marks

2. (a) Qualities of a good inorganic fertilizer for farming

- ✓ Should be easy to apply using simple tool and method.
- ✓ Should be fairly long lasting when applied in the soil
- ✓ Should be less toxic/ poisonous to man and organisms.
- ✓ Should be easy to hand i.e. and store without going bad.
- ✓ Should be cheap and affordable to farmers.
- ✓ Should require less skills to apply in the garden
- ✓ Should supply the required plant nutrient

Award 1 mark for 4 points

1x4 = 4marks

(b) Factors that affect crop response to fertilizers applied.

- ✓ Amount of fertilizers applied ; too much fertilizer applied may scorch the plants
- ✓ **Fertility level of the soil**, crop will not use fertilizers effectively if fertilizer applied on already fertilize soil.
- ✓ **Soil moisture**; the response to fertilizers is high in soil with adequate soil moisture.
- ✓ **Type of crop**; crops respond differently to differentfertilizers eg. Leguminous crops respond less to nitrogenous fertilizers.
- ✓ **Weed infestation**; weed competite with crops for nutrients leading to poor crop response to fertilizer applied.
- ✓ **Plant population**; optimum plant population ensures that plants get adequate nutrients.
- ✓ **Stage of plant growth**; if the fertilizer is applied at the correct stage of plant growth, the response will be good.
- ✓ **Nature of the fertilizer/ form;** crops respond faster to the fertilizer that is highly soluble.
- ✓ **Type of fertilizer**; crops respond differently to different types of fertilizer.
- ✓ **Method of placement of fertilizer**; crops respond well to fertilizers applied correctly.
- ✓ **Pest and diseases**; Affected plants will respond poorly to fertilizers applied .
- ✓ **Soil PH**; suitable PH encourages good crop response to fertilizers applied.
- ✓ **Type of soil**; crop may not respond well to fertilizers applied in more porous soils or sandy soil due to leaching.

Award 1½mark for 8 points.
½ mark for explanation
1½x 8 = 12marks

(c) Importance of potassium in plant nutrition.

- ✓ Improves plant vigour and resistance against certain diseases.
- ✓ Essential for chlorophyll formation.
- ✓ Promotes formation of starch and transportation of sugars within the plant.
- ✓ It is needed for nitrogen metabolism and protein synthesis.
- ✓ Promotes formation of good quality and well developed fruits and seeds.
- ✓ It encourages root growth and development of stems thus reducing lodging of crops.

Award 1 mark for 4 points

1x4 = 4 marks

3. (a) **Benefits of staking in crop production.**

- ✓ Allows production of good quality crops that are not rotten since they are kept off the ground.
- ✓ It reduces spread of soil- born diseases especially fungal ones since the crop is lifted off the ground.
- ✓ Allows enough light to reach all parts of the plant and make enough vitamins.
- ✓ Controls lodging/ bending of plants allows easy movement through the garden without stepping on crops, when weeding and harvesting.
- ✓ Keeps the plant upright allowing free circulation of air around the plant leading to high yields.
- ✓ Facilitates effective covering by chemical during spraying.

Award 1 mark for 5 points

1x5= 5marks

(b) **What considerations a farmer should make when grafting**?

- ✓ Both scion and stock should be woody.
- ✓ The cambium layers of the scion and the stock must touch
- ✓ Both the scion and stock should be disease free
- ✓ The stock should have desirable root characteristics such as disease resistance and tolerance to water logging.

- ✓ The scion should bear buds.
- ✓ The scion and stock should be compatible i.e. should be sourced from plants of the same family.
- ✓ Use sterilised equipment.
- ✓ Use sharp cutting knives or blades.
- ✓ Weather conditions should be desirable.
- ✓ Stage / age of growth of scion and stock should be considered.
- ✓ The scion and stock should be of the same diameter.
- ✓ Availability of grafting tape and grafting wax.

Award 1 mark for 10 points

1x10 = 10marks.

(c) **Disadvantages of late planting of crops.**

- ✓ Crops do not benefit from the nitrogen flush during the early rains.
- ✓ Crops miss some of the seasons rains leading to slow growth and low yields.
- ✓ There is late marketing of farm products therefore they fetch very little profits.
- ✓ Farm operations face competition for labour and this leads to labour shortage and reduction in efficiency.
- ✓ Harvesting is not done in a favourable season so there will be alot of post harvest damage

Award 1 mark for 5 points

1x5 = 5marks

4. (a) **Characteristics of a poor layer bird.**

- ✓ Poor layers have hard, blunt pelvic bones.
- ✓ Poor layers have smooth and shinny feathers.
- ✓ Poor layers have small, dry, pale combs and wattle that feel cold on touch.
- ✓ They have dry, small, pigmented and inactive vents.
- ✓ Poor layers have pelvic bones that are close together and 2-3 fingers cannot fit between them.
- ✓ Poor layers have dull eyes
- ✓ Poor layers have the tendency to go broody.
- ✓ Poor layers have yellow break and shanks.
- ✓ Poor layers have many feathers.

- ✓ Have a hard, fleshy and contracted abdomen so the gizzard cannot be felt on touch.
- ✓ Poor layers have a thick skin underlaid with fat and flesh.

Award 1 mark for 8 points

1x8 = 8marks.

(b) **Abnormalities that occur during egg formation**

- ✓ **Blood spots**; During ovulation, a drop of blood is shed and comes down with the yolk
- ✓ **Meat spot**; A piece of tissue may come off from the ovary at the time of ovulation and it comes down with the yolk.
- ✓ **Rough surface eggs**; this is due to uneven deposition of egg shell.
- ✓ **Double yolk**; it may be due to physiological defect in the oviduct/ ovary releasing two ova at ago.
- ✓ **Eggs that are too small**; it is due to hormonal imbalances.
- ✓ **Soft shelled eggs**; Due to failure of the uterus to deposit calcium/ due to inadequate calcium in the birds diet.
- ✓ **Deformed eggs**; it is due to the defect in the isthmus/ or when muscles of the uterus do not press evenly on the egg.
- ✓ **Shell less eggs**; it is due to a defect in the uterus or failure of the shell gland to deposit calciferous shells around the egg.
- ✓ **Thin shells**; due to diseases or nutritional deficiency of vitamin A, calcium or phosphorous.
- ✓ **Abnormal colour/ foul smell of the yolk**; due to feeds having too much fish meal.

Award 1½ mark for 8 points

½ mark for mention

1 mark for explanation

1½ x 8 = 12marks

5. (a) **Tattooing** refers to piercing the outline of desired numbers or letters on the skin inside the ear.

Award 2 marks for correct definition

2x1 = 2marks.

(b) **How tattooing is done in farm animals**?

- ✓ Restrain the calf
- ✓ Thoroughly scrub the area to be tattooed with soap and water then dry it and rub with methylated spirit to remove wax
- ✓ Rub tattooing ink on the site
- ✓ Fix desired numbers or letters on tattooing forceps.
- ✓ Imprint the forceps firmly on the area avoiding the main veins
- ✓ Rub more ink on the area using a thumb.
- ✓ Release the calf.

Award 2 marks for 7 points logically presented

2x7 = 14marks

(c) **Importance of putting permanent marks on the body of the animal**

- ✓ It eliminates ownership disputes.
- ✓ Record keeping is easy.
- ✓ It helps in the formulation of breeding programmes and control undesired breeding such as in breeding
- ✓ It allows the farmer to identify his/her animals easily incase they have strayed or have been stolen
- ✓ It helps in the formulation of feeding programmes according to age and production.

Award 1 mark for 4 points

1x4 = 4 marks

6. (a) Functional requirements for:

(i) **Deep letter house for birds**

- ✓ Water proof roof to avoid dampness in the house that can easily invite pathogens
- ✓ Rodent proof to avoid spread of diseases.
- ✓ Should have enough laying boxesin case of layers to reduce cases of egg eating.
- ✓ The floor should be made of concrete for easy cleaning.
- ✓ Should have suitable litter on the floor to absorb moisture.
- ✓ Should be accessible so that birds and eggs are easily removed when necessary and taken to the market.
- ✓ Proper ventilation to control respiratory infections

Award 1 mark for 5 points

1x5 = 5marks

(ii) **Milking parlour**

- ✓ Should have feeding troughs where feeds are put for animals.
- ✓ The floor should be cemented and slanting for proper drainage
- ✓ Strong walls of timber or bricks or wire mesh
- ✓ Should have enough space to accommodate the necessary equipment
- ✓ Should be well ventilated for free air circulation.
- ✓ Animal cubicles should be a bit raised and covered with dry litter on the floor to prevent dampness and chilling of the animal.
- ✓ Iron sheet or thatched except the roofing area where animals do exercise and get sunshine.

Award 1 mark for 5 points

1x5 = 5marks

(b) **Procedure of preparing good quality concrete using the hand method.**

- ✓ Clear the area where your to work from
- ✓ Put a layer of motor on the cleared area.
- ✓ Measure aggregate, sand and cement in the ratio of 3: 2: 1
- ✓ Spread the measured amount of sand on the ground/ prepared area.
- ✓ Spread evenly the cement over the sand
- ✓ Turn the materials over and over by using a spade until its colour is uniform.
- ✓ Spread the coarse aggregates over the heap of mixed sand and cement.
- ✓ Turn the coarse aggregate properly in the sand and cement until a uniform distribution is achieved.
- ✓ Make a depression in the middle of the materials and add water slowly.
- ✓ Continue mixing the material until water is just enough.

Award 1 mark for 10 points logically presented points

1x10 = 10marks

7. (a) **Advantages of using animal drought technology**

- ✓ It is economical to use on small scattered plots where traction cannot be used.

- ✓ Animals are multipurpose in nature i.e. on top of providing tractors, they also provide manure and meat.
- ✓ Animal equipments are relatively cheap to buy.
- ✓ Animal equipments are readily available since they are locally made.
- ✓ Animals produce relatively more power than humans.

Award 1 mark for 4 points.

1x4= 4 marks

Disadvantages of using animal drought technology

- ✓ Animals are slow in accomplishing jobs on the farm.
- ✓ Animals get exhausted fast thus cannot work for a long period of time
- ✓ Requires a large piece of land especially for grazing animals before and after work and this leads to wastage of land which would have been used for cultivation of crops.
- ✓ Animal draught technology may not be applicable in hilly areas.
- ✓ Animal power is affected by presence of parasites and diseases unlike engine power.

Award 1 mark for 4 points.

1x4= 4 marks

(b) **Factors that determine the number of tillage operations to be carried out seed bed preparations.**

- ✓ **Topography**; very steep land requires rough ploughing to avoid erosion.
- ✓ **Size of seeds**; smaller size seeds require more operations than big sized seeds.
- ✓ **Type of equipment used**; A disc plough leaves the land in a very untidy state that necessitate several other operations.
- ✓ **Intial condition of the land**; densely vegetated land requires more operations than***** light vegetation
- ✓ **Type of soil**; sandy and other light soils require few operations than clay.
- ✓ **Moisture content of the soil**; very dry soils are hard and require more operations but moist soils are soft and easy to till and require fewer operations.
- ✓ **Liability to erosion**; if the soil is liable to erosion; if the soil is liable to erosion e.g sandy soil requires less operations to avoid erosion

Award 2 marks for 6 points

2x6 = 12 marks

8. (a) **Marketing functions**

- ✓ **Buying and assembling**; this involves buying of producers and gathering it at the collection centre.
- ✓ **Selling**; this involves presentation of produce in an attractive way for consumers/ buyers to take it. It also involves bargaining and advertising goods.
- ✓ **Processing**; it involves changing the form of produce from its raw form to better form which is more acceptable by the consumers.
- ✓ **Transportation**; this involves the physical movement of goods from production centres to consumption centres.
- ✓ **Storage**;This is the temporary boarding of produce so that they availed to consumers when they need them.
- ✓ **Packaging**; it involves placing of agricultural products in suitable containers to facilitate handling, transportation and selling.
- ✓ **Market research**; this involves collecting and analysing market information.
- ✓ **Advertising**; it creates awareness of the product to the people through newspapers mass media e.t.c.
- ✓ **Financing**; this is capital needed to cater for marketing activities involved eg transportation and advertising.
- ✓ **Standardisation**; it refers to the application and establishment of measurement of either quality or quantity.
- ✓ **Grading**; it involves sorting of produce into uniform nature. It is done on the basis of size, shape, colour e.t.c

Award 1½ mark for 8 points

1½ x 8 = 12marks

(b) **Problems farmers face when marketing dairy products**

- ✓ **Lack of communication**; most farmers do not get information about the availability of better markets and prices.
- ✓ **Poor roads / infrastructure**; farmers find it difficult to transport milk to where prices are good
- ✓ **Lack of means of transport**; delays the delivery of dairy products to the market.

- ✓ **Lack of dairy co-operatives**; this leads to difficult in marketing of dairy products
- ✓ **Exploitation by middle men**; farmers are paid less and get discouraged.
- ✓ **Lack of capital**; to finance the marketing of dairy products.
- ✓ **Presence of diseases**; limits the marketing of diary products.
- ✓ **Price fluctuation**; due to changes in supply at particular season.
- ✓ **Variation in the qualityof dairy product** leads to variation in the prices of the product.
- ✓ **Lack of storage facilities**; this leads to spoilage and wastage of dairy products.
- ✓ **Attitude of the consumer**; some people de-taste consuming certain dairy products.
- ✓ **Taste and preference**; some people prefer consuming certain dairy products.
- ✓ **Political instability**; affects marketing of dairy products.

Award 1 mark for 8 points

1x8 = 8marks

9. (a) **Land reforms**; refers to an organised action designed to improve the structure of land tenure and use

Award 2 marks for correct definition

2x1 = 2 marks

(b)(i) **Benefits of land consolidation**

- ✓ It is easy to supervise farm operations.
- ✓ It encourages mechanization on the farm.
- ✓ Useful productive time is not wasted in moving from one plot to another.
- ✓ Large scale production can be carried out on the farm.
- ✓ Transport costs of produce from the farm is reduced.
- ✓ It is easy to control pests, diseases and weeds from the farm.
- ✓ Theft of produce is reduced due to improved supervision.
- ✓ It facilitates effective and efficiency in farm planning.
- ✓ It is easy to carryout soil and water conservation

Award 1 mark for 8 points

1x8 = 8 marks.

(b) (ii) **Benefits of land consolidation**

- ✓ The land owner has security of tenure and can be compensated by government.
- ✓ The land owner can use the land title to acquire a loan from a bank.
- ✓ The land owner can rent his/ her land to another person to get extra income
- ✓ The land owner is encouraged to develop the land by establishing penennial crops and fencing.
- ✓ The land owner is encouraged to carry out soil conservation practices to protect the land.
- ✓ It is easy to transfer ownership of land.

Award 1 mark for 5 points

1x 5 = 5 marks

(c) **Characteristics of a good land tenure system**

- ✓ It should allow better land settlement schemes.
- ✓ It should lead to high level of production
- ✓ It should encourage and promote commercialization of Agriculture.
- ✓ It should enable effective use and adoption of suitable technologies for production.

Award 1 mark for 5 points.

1x5 = 5 marks

END