**THE UNITED REPUBLIC OF TANZANIA**

**NATIONAL EXAMINATIONS COUNCIL OF TANZANIA**

**CERTIFICATE OF SECONDARY EDUCATION EXAMINATION**

**034/2** **AGRICULTURE 2**

**Time : 2:15 Hours** **ANSWERS** **Year : 2017**

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**Instructions**

1. This paper consists three questions.
2. Answer **two** questions.
3. Communication devices and any unauthorised materials are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

1. You are provided with specimens A, B, C, D, E, F, G and H. Observe them carefully and answer the following questions:

(a) (i) Identify each of specimens A, B, C and D by their botanical names.
Specimen A is Manihot esculenta, which is cassava.
Specimen B is Zea mays, which is maize.
Specimen C is Oryza sativa, which is rice.
Specimen D is Phaseolus vulgaris, which is common bean.

(ii) How is specimen A used?
Specimen A is used as a staple food, where its roots are boiled, fried or ground into flour for human consumption. It is also used as animal feed and in industries for making starch and alcohol.

(iii) Why specimen A should not be fed freshly to animals?
Specimen A should not be fed freshly to animals because it contains cyanogenic glycosides which release hydrocyanic acid, a toxic compound that can poison animals.

(iv) Name the major common five diseases which affect specimen B and C.
Specimen B, maize, is affected by maize streak virus, maize smut, leaf blight, downy mildew, and maize rust. Specimen C, rice, is affected by rice blast, bacterial leaf blight, sheath blight, rice tungro virus, and brown spot disease.

(v) Suggest one crop which can be intercropped with both specimens B and C.
One crop that can be intercropped with both maize and rice is soybean, because it improves soil fertility through nitrogen fixation.

(vi) Name two crop pests which attack specimen D.
Common bean is attacked by aphids and bean weevils.

(vii) How is specimen E useful over specimen B?
Specimen E, sorghum, is more drought-resistant than maize, making it more reliable in semi-arid areas where maize cannot thrive. It also tolerates poor soils better than maize.

(viii) Give four processed by-products of specimen E.
Processed by-products of sorghum include sorghum flour for porridge and bread, beer brewed from sorghum, animal feed made from sorghum stalks and bran, and biofuel from fermented sorghum.

(b) (i) Propose six good qualities of specimen F.
Specimen F, silage, should be free from moulds and fungi. It should have a pleasant smell, usually acidic but not foul. It should be greenish or yellowish in colour, not black. It must have high nutritive value, rich in carbohydrates and proteins. It should be well compacted with no trapped air. It should also have good moisture content, not too wet or too dry.

(ii) Among the organic acids made up in the process of making specimen F, which is the best indication of good quality for specimen F in a silo?
The best indication of good quality silage is the presence of lactic acid, which ensures preservation and proper fermentation.

(c) Describe briefly two sites to be avoided in planting specimen G and give reasons to support it.
Bananas should not be planted in waterlogged areas because excess water causes root rot. They should also not be planted in shallow soils because bananas require deep fertile soils for strong root anchorage and nutrient supply.

(d) (i) Identify specimen H by its common and scientific name.
Specimen H is pigweed, with the scientific name Amaranthus spp.

(ii) Describe briefly why specimen H has been given such a common name.
It has been given the name pigweed because it grows aggressively like a weed and is often fed to pigs as a cheap source of animal feed.

2. You are provided with specimens I, J, K, L, M, N and O. Observe them carefully and answer the following questions:

(a) (i) Identify specimen O.
Specimen O is an egg candler.

(ii) Briefly explain the purpose of specimen O.
The purpose of an egg candler is to check the quality and development of eggs by shining light through them to observe the embryo and air space.

(iii) Deduce five observations you would check through specimen O with respect to specimen I.
One observation is the size of the air cell, which indicates freshness. Another is the presence or absence of blood spots. A third observation is embryo development for fertilized eggs. A fourth observation is cracks or defects in the shell. A fifth observation is the movement of the yolk within the egg.

(iv) Enumerate six characteristics for specimen I to be used for incubation.
Specimen I, a fertile egg, should be medium-sized, not too large or small. It should have a strong shell without cracks. It must be clean and free from faeces or dirt. It should have a normal shape, not deformed. It should be fresh, not stored for long before incubation. It must be fertile, obtained from healthy hens and roosters.

(b) (i) How could you train the calf to drink specimen J in bucket feeding?
Training a calf involves first dipping two fingers into milk and allowing the calf to suck them. While sucking, the fingers are lowered gradually into the bucket containing milk. The calf learns to drink from the bucket while following the fingers. With repetition, the calf eventually learns to drink directly from the bucket.

(ii) Name two by-products of specimen J.
Specimen J, milk, produces cream and butter as by-products.

(iii) State five characteristics of a high quality of specimen J.
High-quality milk is free from dirt and physical contaminants. It is free from bad odour and has a pleasant natural smell. It has a normal white or slightly yellowish colour. It contains no clots or curdling. It is fresh and has no signs of souring.

(c) (i) Describe briefly the five steps for harvesting specimen K.
Specimen K, coffee, is harvested by first identifying ripe red berries. Second, pick the ripe berries by hand or strip them from the branches. Third, collect the berries in a basket or container. Fourth, transport the harvested berries to a processing unit. Fifth, process them through pulping, fermenting, drying, and grading.

(ii) Describe briefly eight steps for processing specimen L.
Specimen L, maize, is processed by harvesting when mature and drying the cobs to reduce moisture. The kernels are then shelled from the cobs. The grains are cleaned to remove impurities. They are milled to produce maize flour or grits. The flour is sieved to ensure consistency. The product is packaged for storage. It is stored in dry and clean bags. Finally, the product is marketed for consumption.

(d) (i) State five considerations to be observed in order to get good quality of specimen M.
Specimen M, hay, should be harvested at the right stage, usually before flowering. It should be dried properly to reduce moisture content. It should be stored in a dry, well-ventilated place. It should be free from weeds and poisonous plants. It should be green in colour, not brown, to show good nutrient content.

(ii) Propose five practices to be carried out on specimen N before preservation.
Specimen N, fish, should first be washed thoroughly to remove dirt. It should be gutted by removing internal organs. It should be scaled to remove outer covering. It should be cut into appropriate sizes for preservation. Finally, it should be salted or smoked before storage.

3. You are provided with specimens P, Q, R, S, T, U, V and W. Observe them carefully and answer the following questions:

(a) (i) Identify the given specimens P, Q and R.
Specimen P is a spanner.
Specimen Q is a hammer.
Specimen R is a file.

(ii) Describe briefly the difference between specimens P and R.
Specimen P, a spanner, is used for tightening and loosening nuts and bolts, while specimen R, a file, is used for smoothing and shaping surfaces by abrasion.

(iii) State four general properties of specimen R.
A file is made of hardened steel. It has teeth cut on its surface for abrasion. It is strong and durable. It is available in different grades of smoothness.

(b) (i) Describe briefly why specimen S is called a ‘reciprocated part’.
Specimen S, a piston, is called a reciprocated part because it moves back and forth in a cylinder during engine operation.

(ii) Name other three reciprocating parts in a tractor engine.
Three reciprocating parts are the connecting rod, valves, and pushrods.

(c) (i) Identify each of the specimens T and U.
Specimen T is a ploughshare.
Specimen U is a harrow disc.

(ii) Explain briefly the uses of the two classes of specimen T blades.
One class of ploughshare blade is used for cutting through soil and turning it over. Another class is used for breaking up clods and preparing fine tilth.

(iii) Name four joints made up from the work of specimen U.
Specimen U helps in making lap joints, butt joints, mortise and tenon joints, and dovetail joints.

(d) (i) Considering quality and durability, what other four types of pipes apart from specimen V could be useful in plumbing?
Four other pipes include copper pipes, plastic pipes (PVC), galvanized iron pipes, and concrete pipes.

(ii) Propose seven pipe fittings for joining or changing direction in specimen V.
Seven fittings are elbows, tees, unions, couplings, reducers, nipples, and caps.

(e) (i) Give four uses of specimen W in a tractor system.
Specimen W, an oil filter, is used to remove impurities from engine oil, extend engine life, improve lubrication, and ensure smooth running of engine parts.

(ii) Recommend two parts to be applied using specimen W in a tractor system.
Two parts are the engine bearings and the piston rings, since they require clean oil for smooth functioning.