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KCSE  
AGRICULTURE  
Paper 2  
MARCH 2021  
MARKING SCHEME

THE KENYA NATIONAL EXAMINATIONS COUNCIL  
KENYA CERTIFICATE OF SECONDARY EDUCATION

AGRICULTURE

PAPER 2

MARKING SCHEME  
(CONFIDENTIAL)

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This paper consists of 8 printed pages.

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Turn Over

SECTION A (30 marks)

1.	<p>Functions of walking area</p> <ul style="list-style-type: none"> <li>➤ Exercise</li> <li>➤ For dunging</li> <li>➤ sunning</li> </ul>	(2 x ½ mark)	(1 mark)
2.	<p>Characteristics of succulent roughages</p> <ul style="list-style-type: none"> <li>➤ High fibre content</li> <li>➤ High moisture content</li> <li>➤ Low protein content</li> <li>➤ High carbohydrate content</li> </ul>	(4 x ½ mark)	(2 marks)
3.	<p>Symptoms of contagious abortion</p> <ul style="list-style-type: none"> <li>➤ Spontaneous abortion/premature birth <i>- Low libido</i></li> <li>➤ Retained afterbirths/placenta after abortion <i>- Barrenness</i></li> <li>➤ Orchitis in bulls/low-libido/barrenness in cows</li> <li>➤ Yellow brown slimmy/odourless discharged from vulva after abortion</li> </ul>	(4 x ½ mark)	(2 marks)
4.	<p>Factors considered in selecting eggs for marketing</p> <ul style="list-style-type: none"> <li>➤ Cleanliness</li> <li>➤ Size of egg</li> <li>➤ Candling qualities <i>Accept. specific candling qualities e.g. freshness.</i></li> <li>➤ Egg colour</li> <li><i>- shell texture</i></li> </ul>	(4 x ½ mark)	(2 marks)
5.	<p>Maintenance practice of hoof trimmer <i>- cutter</i></p> <ul style="list-style-type: none"> <li>➤ Repair broken parts <i>e.g. handle.</i></li> <li>➤ Oil the metal parts on long storage</li> <li>➤ Sharpen jaws when blunt</li> <li>➤ Clean after use</li> <li>➤ Grease moving parts to reduce friction</li> <li>➤ Tightening the nut</li> <li><i>- Proper storage.</i></li> </ul>	(4 x ½ mark)	(2 marks)
6.	<p>Disadvantages of a tractor as a source of power</p> <ul style="list-style-type: none"> <li>➤ Expensive to buy and maintain</li> <li>➤ Requires skilled personnel</li> <li>➤ Their use is limited in certain areas <i>ie. slopy areas.</i></li> <li>➤ It requires support services <i>P.W.T.T.E</i></li> <li><i>- Expensive to maintain</i></li> </ul>	(2 x ½ mark)	(2 marks)
7.	<p>Beef breeds</p> <ul style="list-style-type: none"> <li>➤ Hereford</li> <li>➤ Galloway</li> <li>➤ Aberdeen angus</li> <li>➤ Beef shorthorns</li> </ul>		

	Charolais <b>PDF Compressor Free Version</b>	(4 x ½ mark)	(2 marks)
8.	Origin of breeds Friesian - Holland/Holstein (Denmark) <i>except Netherlands</i> Ayrshire - Scotland	(2 x ½ mark)	(1 mark)
9.	Control measures of foot rot Clean environment/avoid dampness/muddy conditions Regular hoof trimming Regular walk through foot bath/copper II sulphate solution Treat wounds with antiseptics Isolate sick animals	(4 x ½ mark)	(2 marks)
10.	Signs of heat in pigs Restlessness Frequent urination Swelling & reddening of the vulva Clear & slimy mucus discharge from the vulva Frequently mounting others Positive response to riding test	4 x ½ mark)	(2 marks)
11.	Categories of livestock parasites Internal parasites/endo-parasites External parasites/ecto-parasite	2 x ½ mark	(1 mark)
12.	Types of calf pens Raised permanent pens / <i>slatted floors</i> Permanent calf pen with concrete floors Mobile calf pens	2 x ½	(1 mark)
13.	Importance of identification Selection/breeding Disease control/treatment Feeding Record keeping Culling - <i>For tracing purposes.</i>	4 x ½	(2 marks)
14.	Preventive measures for livestock diseases Isolation of sick animals Imposition of quarantine Use of prophylactic measures Slaughter and proper disposal of infected animals Use of antiseptics/disinfectants		

*To save*  
*- control of vectors*  
*- vaccination*  
*- deworming*  
*- prophylactic drugs.*

*- Proper feeding*  
*- Proper housing*  
*- Proper hygiene*  
*- Control.*  
*- Proper selection and breeding.*  
*- treatment of sick animals.*

		4 x ½	(2 marks)
15.	Reasons of castration <i>- to control inbreeding.</i> > Control breeding > Control breeding diseases > Hasten growth rate > Increase quality of meat especially in goats <i>- to make the animal docile.</i>	4 x ½	(2 marks)
16.	Causes of livestock diseases > Bacteria <i>- Chemical causes.</i> > Protozoa <i>- Parasites</i> > Virus <i>- Amount of food eaten.</i> > Nutritional disorders > Physical injuries <i>- Fungi.</i>	4 x ½	(2 marks)
17.	Methods of fish preservation > Freezing > Salting > Sun drying > Smoking	4 x ½	(2 marks)

SECTION B (20 marks)

18.	(a) Cattle/sheep/goat		(1 mark)
	(b) E - Abomasum   <i>True stomach.</i>		(1 mark)
	F - Reticulum   <i>Honey comb</i>		(1 mark)
	(c) Functions of rumen(G) > Temporary storage of food before regurgitation ✓ > Fermentation of food ✓ > Microbial digestion ✓ → Synthesis of <u>vitamin B</u> complex ✓ → Synthesis of Amino acids ✓ → Breakdown of protein to peptides ✓ → Breakdown of carbohydrates and cellulose to carbon(iv) oxide and volatile fatty acids ✓ > Absorption of ammonia gas & fatty acids ✓	2 x 1	(2 marks)
19.	(a) (i) Fowl pox		(1 mark)
	(ii) Legs/vent/wings		(1 mark)

	<p>(b) Predisposing factors of fowl pox</p> <ul style="list-style-type: none"> <li>- Presence of wounds</li> <li>- Presence of biting insects e.g. mosquitoes/mites</li> </ul>	2 x 1	(2 marks)
	<p>(c) - Vaccination</p> <ul style="list-style-type: none"> <li>- Killing and proper disposal of all infected birds</li> </ul>	1 x 1	(1 mark)
20.	<p>(a) (i) Debeaking</p> <p>(ii) It cauterizes the wound   Prevent bleeding   Prevent infection   Sterilize the wound.</p> <p>(b) - Cannibalism</p> <ul style="list-style-type: none"> <li>- Egg eating</li> </ul> <p>(c) - Provide adequate balanced diet</p> <ul style="list-style-type: none"> <li>- Hang vegetables in the poultry house to keep the birds busy by hanging vegetables in the poultry house   Scattering</li> </ul>	2 x 1	1 mark 1 mark 2 marks 1 mark
21.	<p>(a) Elastrator and rubber ring ✓ Rubber ring ✓</p> <p>(b) (i) docking</p> <p>(ii) castration</p> <p>(iii) dis-budding</p> <p>(c) (i) bloodless</p> <p>(ii) Less painful/stressful 2x1 Less stressful - Less skills required</p>	1 x 1 2 x 1 2 x 1	1 mark 2 marks 2 marks

SECTION C (40 marks)

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<p>22.</p>	<p>(a) Requirements of ideal calf pen</p> <p><i>Easy to clean</i></p> <ul style="list-style-type: none"> <li>➤ Cleanliness: - pens should have concrete floors to facilitate cleaning</li> <li>➤ <i>Make Dry &amp; Warm</i> Dryness and warmth: - dry litter should be placed on the floor to avoid dampness/wetness.</li> <li>➤ Roof should not leak/avoid spilling water on the floor to discourage dampness and wetness of the litter</li> <li>➤ Adequate space: Should be spacious for exercise, feeding and watering of calves.</li> <li>➤ Proper lighting - should be well lit as light is necessary for synthesis of vitamin D.</li> <li>➤ Proper drainage - should be constructed on a well-drained place to avoid dampness</li> <li>➤ Draught free - to prevent entry of cold winds and discourage infections like pneumonia</li> <li>➤ Proper ventilation - to allow free air circulation</li> <li>➤ Single housing - calves should be housed singly to prevent licking one another which can lead to formation of hair - balls in the rumen</li> </ul>	<p>7 x 1 (7 marks)</p>
	<p>(b) Disadvantages of natural mating</p> <ul style="list-style-type: none"> <li>➤ High chances of inbreeding</li> <li>➤ Possible to transmit sexual diseases</li> <li>➤ Males need extra costs of feeding and rearing</li> <li>➤ Large males can injure small females</li> <li>➤ A lot of semen is wasted</li> <li>➤ Difficult and expensive to transport a bull over long distances to serve a cow</li> <li>➤ Bulls are expensive to acquire</li> <li>➤ Most bulls are aggressive hence difficult to handle</li> </ul>	<p>8 x 1 (8 marks)</p>
	<p>(c) Pre-disposing factors</p> <ul style="list-style-type: none"> <li>➤ Species of animal - certain diseases affect specific species e.g. swine fever only affects pigs</li> <li>➤ Breed of the animal - certain diseases affect specific breeds of animals e.g. cancer of the eye only affects Hereford breeds</li> <li>➤ Age of the animal - certain diseases are associated with certain age group of animals e.g. piglet anaemia only affects piglets</li> <li>➤ Sex of the animal - certain diseases are associated with certain sex of animals e.g. mastitis only affects female animals</li> </ul>	

- + *Age - old animals are likely to be infected than young ones.*
- \* *Stage of lactation - animals are likely to suffer at the beginning and at the end of lactation.*
- \* *Udder attachment - animals with large pendules loosely hanging udder + long teats are more susceptible to mastitis*
- \* *Incomplete milking - when milk left in teat canal it acts as culture medium for bacteria*
- + *Mechanical injuries - wounds on teats/udder allow micro-organisms entry into the udder.*
- \* *Poor sanitation - increases multiplication of the bacteria causing mastitis.*
- \* *Poor milking techniques - may result in mechanical injury of the teats, sphincter muscles of the teats 6x1 = 6mks*

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	<ul style="list-style-type: none"> <li>➤ Colour of the animal: Animal which are black in colour suffer from heat stress/light pigmented skin suffer from photosensitization when exposed to high light intensities</li> </ul> <p style="text-align: right;">5 x 1</p>	(5 marks)
23	<p>(a) Requirements of artificial brooder</p> <ul style="list-style-type: none"> <li>➤ Litter: should be inform of wood shavings to maintain warmth and absorb moisture</li> <li>➤ Fresh air/ventilation: should have holes for ventilation on the walls to allow proper gaseous exchange</li> <li>➤ Heat source – a heat source be provided and controlled to maintain correct temperature within the brooder.</li> <li>➤ Well lit – to allow chicks to see feeds and water.</li> <li>➤ Dim light is recommended as bright light blinds the chicks and enhances toe pecking</li> <li>➤ Have <u>adequate waterers</u>; and <u>feeders</u>; to allow for proper feeding and watering of chicks without overcrowding</li> <li>➤ Shape of the brooder : should be round in shape to avoid chicks overcrowding at the corners</li> <li>➤ Fresh feed and water:</li> <li>➤ Some feeds should be put on newspapers on the floor until chicks learn to feed from the feeders</li> </ul> <p><i>- Have adequate feeders - to allow for proper feeding without overcrowding</i></p>	9 x 1 (9 marks)
	<p>(b) Operation of a four stroke cycle engine</p> <ul style="list-style-type: none"> <li>➤ Induction stroke; the piston moves down the cylinder; inlet valve opens; fresh air and petrol is drawn into the cylinder;</li> <li>➤ Compression stroke; the inlet valve closes, outlet valve closes; the piston up moves up the cylinder; this compresses air fuel mixture in the combustion chamber;</li> <li>➤ Power stroke; a spark produced by the spark plug; this causes compressed fuel mixture to light and expand; resulting in pressure that forces piston down the cylinder;</li> <li>➤ Exhaust stroke: piston moves up the cylinder; eliminating burnt fuel mixture through open exhaust valve;</li> </ul>	11 x 1 (11 marks)
24	<p>(a) Control measures of tapeworms</p> <ul style="list-style-type: none"> <li>➤ Use of anthelmintic drugs <i>prophylactic drugs</i></li> <li>➤ Keep animal house clean and disinfected</li> <li>➤ Rotational grazing</li> <li>➤ Keep feeders and waters clean</li> <li>➤ Proper disposal of human excreta</li> <li>➤ Proper inspection of meat</li> <li>➤ Proper cooking of meat</li> </ul> <p><i>- Ploughing of infested pastures</i></p>	

	<ul style="list-style-type: none"> <li>➤ Burning of infected pastures</li> </ul>	5 x 1	(5 marks)
	<p>(b) Milking equipment</p> <ul style="list-style-type: none"> <li>➤ udder cloths and towels for cleaning/drying the udder</li> <li>➤ filtering pads for straining milk</li> <li>➤ milking jelly for applying on teats to prevent cracking</li> <li>➤ warm water for washing the udder</li> <li>➤ milking pail/bucket for milking / holding milk during milking</li> <li>➤ milking churn for holding milk in storage or transportation</li> <li>➤ milking stool to sit on during milking</li> <li>➤ weighing scale for weighing milk</li> <li>➤ cooler/fridge for cooling milk</li> <li>➤ strip cup for checking mastitis</li> <li>➤ milking machine for machine milking</li> <li>➤ rope/chain for retraining the cow</li> </ul>	10 x 1	(10 marks)
	<p>(c) Life cycle of a one host tick</p> <ul style="list-style-type: none"> <li>➤ Eggs hatch larvae which climb onto the host and feed on blood;</li> <li>➤ Engorged larvae moult, nymphs emerge, feed on blood;</li> <li>➤ Engorged nymphs moult, adults emerge;</li> <li>➤ Adults feed on blood and mate;</li> <li>➤ Engorged female falls to ground and lays eggs;</li> </ul>	5 x 1	(5 marks)