

FORM 4 MID TERM 1 2026 - MARKING SCHEME

AGRICULTURE MARKING SCHEME

1. Define the following terms (2mks)

- Hybrid Vigor (Heterosis): The increased performance/superiority of the offspring (crossbreed) compared to the average of the parents.
- Epistasis: The interaction between genes at different loci (allelic and non-allelic) where one gene masks the expression of another.
- Outbreeding: Mating of unrelated animals which are less closely related than the average of the population.
- Close breeding: Mating of animals that are closely related (e.g., sire to daughter, brother to sister).
(Award $\frac{1}{2}$ mk for each correct definition)

2. List four signs of heat in cattle ($4 \times \frac{1}{2} = 2$ mks)

- Standing to be mounted (by other cows)
- Mounting other cows
- Swelling and reddening of the vulva
- Clear mucus discharge from the vulva
- Restlessness/bellowing
- Tail raising
- Reduced milk production

3. Type of presentation (1mk)

- Breech presentation (Posterior presentation)

4. Differentiate (2mks)

- Crutching vs Ringing: Crutching is the removal of wool from around the udder/vulva/tail of sheep; Ringing is putting a rubber ring on the horn bud of a young calf to prevent horn growth.
- Flushing vs Steaming-up: Flushing is increased feeding before mating to increase ovulation; Steaming-up is increased feeding in late pregnancy to ensure healthy offspring birth and milk production.

5. a) Types of castration (Any $2 \times \frac{1}{2} = 1$ mk)

- Open method (surgical)
- Closed method (bloodless e.g., Burdizzo)
- Rubber ring (Elastrator)
- Emasculator

b) Animals for rubber ring (Any $2 \times \frac{1}{2} = 1$ mk)

- Sheep
- Goats
- Calves (young)

6. Reproductive system of a hen

- a) Parts B, C, D, E ($4 \times \frac{1}{2} = 2$ mks)
 - B: Infundibulum (or Magnum depending on diagram)
 - C: Isthmus (or Uterus/Shell gland)
 - D: Uterus (Shell gland)
 - E: Cloaca/Vent
- b) Fertilization: Infundibulum. (1mk)
- c) Roles (2mks)
 - C (Isthmus): Adds the inner and outer shell membranes.
 - E (Cloaca/Vent): Acts as the exit passage for the egg.

7. Advantages of organic mulch (Any $4 \times 1 = 4$ mks)

- Conserves soil moisture (reduces evaporation).
- Suppresses weed growth.
- Regulates soil temperature.
- Adds organic matter to the soil upon decomposition.
- Prevents soil erosion.

8. Causes of swarming in bees (Any $4 \times 1 = 4$ mks)

- Overcrowding in the hive.
- Old queen becoming less productive.
- Lack of forage/nectar.
- Pest infestation or disease.
- Unfavorable climatic conditions.
- Instinctive reproduction.

9. Calculate K_2O (3mks)

- Fertilizer grade = 30:20:10 (N:P:K).
- % of $K_2O = 10\%$.
- Amount of fertilizer = 600 kg.

- Amount of $K_2O = (10/100) \times 600 = 60$ kg.

10. Identification Methods

- Name: Ear notching. (1mk)
- Tool: Ear notcher. (1mk)
- Number from diagram: (Award 1mk if correct based on visual).
- Illustrate Number 18: Student must draw an ear with notches summing to 18 according to standard code. (1mk)
- Reasons for identification (Any 4 x $\frac{1}{2} = 2$ mks)
 - Keeping farm records (production, breeding).
 - Identification of stolen animals.
 - Monitoring health/treatment.
 - Selection for breeding/culling.
 - Management (age determination).

11. Why manure is discouraged in carrot production (1mk)

- It causes forking/forked roots (excess nitrogen).

12. Characteristics of Nitrogenous fertilizers (Any 4 x $\frac{1}{2} = 2$ mks)

- Highly soluble in water (hygroscopic).
- Promote vegetative/green growth.
- Leach easily in the soil.
- Have acidic effects on the soil.
- Can cause burning of crops.

13. Tools M, N, P, Q (4 x $\frac{1}{2} = 2$ mks)

- (Identify based on diagrams in paper: e.g., Jembe, Rake, Fork, Wheelbarrow).

14. Soil sampling methods

- Use of soil auger.
- Pitting / Profile pit method. (1mk)

15. Dairy breeds of goats (Any 2 x $\frac{1}{2} = 1$ mk)

- Toggenburg, Alpine, Saanen, British Alpine.

16. Advantages of using seeds (Any 4 x 1 = 4mks)

- Easy to handle and store.

- Easy to transport.
- Can remain viable for a long time.
- Not disease carriers (if certified).
- One plant produces many seeds (high multiplication rate).
- Established faster than vegetative parts.

17. Seed dressing vs Inoculation (2mks)

- Seed dressing: Applying fungicides/insecticides to seeds to protect them from pests/diseases.
- Seed inoculation: Coating legume seeds with rhizobia bacteria to enhance nitrogen fixation.

18. Fertilizer Application

- a) Figures: 5 = Nitrogen (%), 20 = Phosphorus (% as P_2O_5). (1mk)
- b) Calculation (3mks)
 - Area of plot = $3\text{ m} \times 4\text{ m} = 12\text{ m}^2$.
 - Rate = 200 kg/ha (1 ha = 10,000 m^2).
 - Amount required = $(12 / 10,000) \times 200 = 0.0012 \times 200 = 0.24\text{ kg}$ or 240 grams.

