

• MEMO

A term for genetic make-up

1.1.1 Genotype ✓ (1)

1.1.2 Mendel's law of inheritance

Mendel's law of segregation ✓ (1)

1.1.3 Mendel's law of independent assortment

Different pairs of genes separate independently of the members of other pairs
✓ when two or more characteristics are involved ✓ (2)

Monohybrid crossing

1.2.1

Gametes	r	r
R	Rr	Rr
R	Rr	Rr

MARKING RUBRIC

- Correct gametes of male parent ✓ (1)
 - Correct gametes of female parent ✓ (1)
 - Correct genotype of the offspring ✓ (1)
- Punnett square populated with gametes and offspring ✓

1.2.2 Percentage of red piglets

- $\frac{0}{4} \times 100$ ✓
- = 0% ✓ (2)

Activity 2

Male animal (bull) is represented by: XYgametes X or Y ✓

• Female animal (cow) is represented by: XX gametes X or X ✓

	X	Y
X	XX	XY
X	XX	XY

✓

Therefore 50 % chance of female calve ✓

Activity 3

A	B	C
Shape✓	Colour ✓	Colour ✓

Shape - round✓

Colour - white ✓

4.1.1 r ✓ - recessive ✓ **OR**

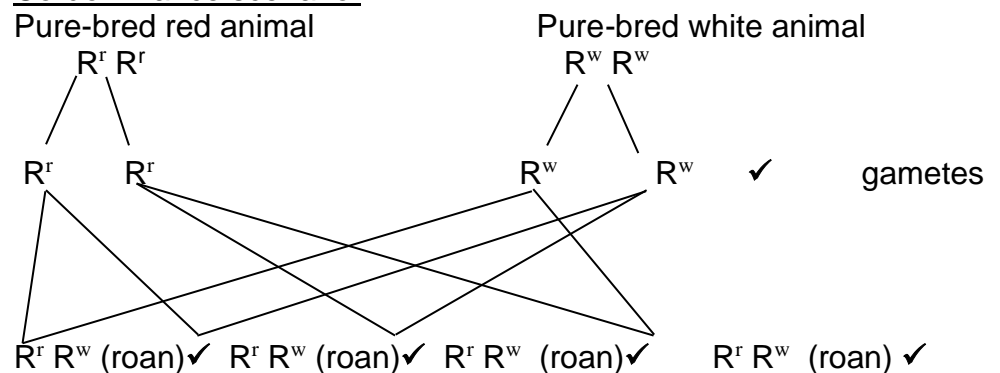
R^w / W ✓ - co-dominant ✓

(2)

4.1.2 $Rr / R^r R^w / RW$ ✓ –crossing of red (R / R^r) and white ($R^w / W / r$)✓
(2)

4.1.3 This question allows for different interpretations by learners:

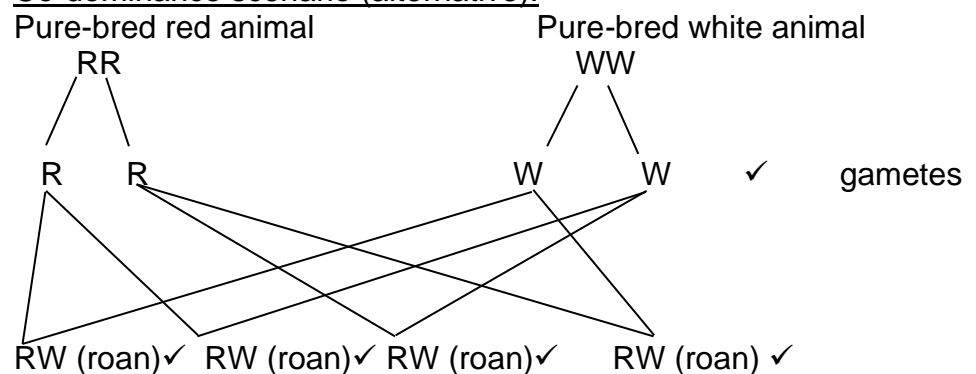
Co-dominance scenario:



(Schematic representation) ✓

OR

Co-dominance scenario (alternative):



(Schematic representation) ✓

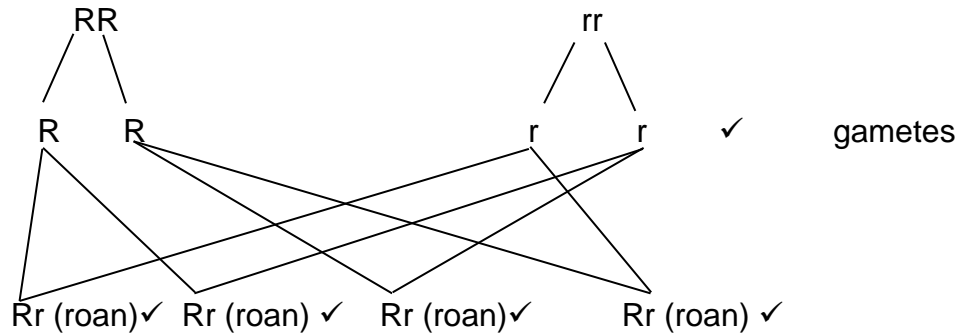
(6)

OR

Incomplete dominance scenario:

Pure-bred red animal

Pure-bred white animal



(Schematic representation) ✓

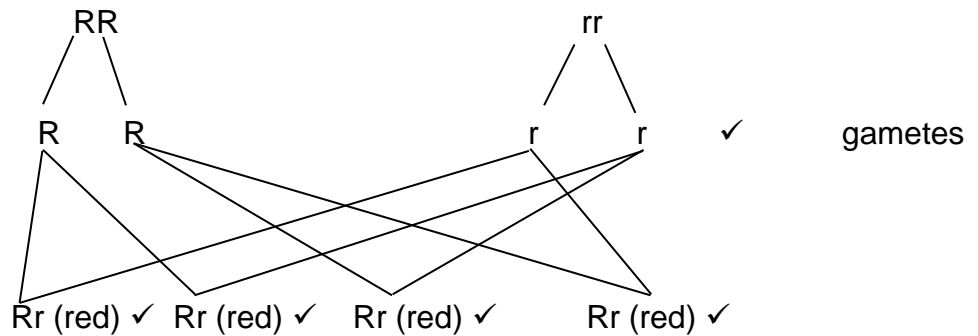
(6)

OR

Pure dominance scenario:

Pure-bred red animal

Pure-bred white animal



(Schematic representation) ✓

(6)

5.1.2 Genotype of individuals

• No. 1 - aa ☐ ✓

• No. 8 - Aa ☐ ✓

(2)

5.1.3 Phenotype of individuals

• No. 5 - dark ☐ ✓

• No. 12 - white ☐ ✓

(2)

5.1.4. (a) Homozygous - No. 10 ☐ ✓

(b) Heterozygous - No. 3 ☐ ✓

(2)

6.1 **The diagram depicts the causes of variation in plants.**

- 6.1.1 Soil factors ✓
 Temperature ✓
 Light intensity ✓
 Diseases ✓
 Moisture content from the ground ✓

(3)

6.1.2 Height of the crops ✓

Variation & Selection

6.2.1 Natural selection ✓

(1)

6.2.2 **TWO important uses of variation in breeding**

- Improvement of existing breeds/cultivars/selection of parent stock ✓
- Bring about/introduce new breeds/cultivars ✓
- Brings about evolution ✓

(Any 2)

6.2.3 **Influence of heritability of characteristics**

- The higher the heritability of characteristics, ✓ the quicker the improvement of breeding programme ✓

18 Heredity in sheep

18.1 Fleece weight ✓
 Lowest heredity characteristic of 17% ✓

(2)

- 18.2 (a) Post-weaning gain ✓
 (b) Birth weight ✓
 (c) Fleece weight ✓

(1)

(1)

(1)

18.3 Housing (environmental factor) ✓
 Nutrition (environmental factor) ✓
 Pests and diseases ✓

(Any 2)

ACTIVITY

MEMO

- 7.1 • Mass selection ✓
 • Pedigree selection ✓
 • Family selection ✓
 Progeny selection ✓.

(4)

7.2.1 **Traditional selection method**

1.2.1 **Define selection**

- Process of choosing/identifying specific individuals ✓

- For their desired characteristics/traits ✓
- To be used in the production of quality offspring ✓
(Any 2) (2)

7.2.2 **Method of selection in the scenario.**

- Mass selection ✓

7.2.3 **THREE characteristic considered for selection**

- Growth ✓
- Health ✓
- Fertility ✓ (3)

7.2.4 **Aspects to improve phenotype of animals**

- (a) **Best** bulls for growth/health/fertility were shared ✓
- (b) Utilizing the best available pastures/keeping them away from wet/muddy areas ✓ (2)

8.1 **Breeding systems and technologies**

8.1.1 **The breeding methods:**

- A. Upgrading ✓
- B. Inbreeding ✓
- C. Crossbreeding ✓

(3)

8.1.2 **Breeding method for heterosis**

C/A ✓ (1)

8.1.3 **TWO disadvantages of inbreeding**

- Loss of vigour/performance/inbreed depression ✓
- Loss of fertility ✓
- Smaller genetic variation
- Increase of lethal genes which can result in death ✓
- Reduced vitality ✓
- Fixation of undesired genes ✓
- Expert knowledge required ✓
- Less resistance to diseases ✓
- Poorly adapted to the environment ✓

- Deformed animals ✓ (Any 2) (2)
- 8.1.4 **Change the enterprise from Brahman to a Bonsmara**
- Upgrading/A ✓ (1)

9.1 Horse, donkey and the mule.

- 9.1.1 **Breeding system**
Species crossing ✓
(1)
- 9.1.2 **Type of animal**
Mule ✓ (1)
- 9.1.3 **TWO uses of the mule in farming**
- Used as draught animals for pulling implements/ploughing ✓
 - To carry loads ✓ (2)

Polygenetic inheritance

10.1.1 AaBcCcDD plant =40cm+4cm+4cm+4cm+4cm+4cm✓
=60cm✓

10.1.2 Genotype of 68cm tall plant

- a) AABBCcDd/AABBCcDD/AABbCCDD/AaBBCCDD ✓
- b) Phenotype of the shortest plant
40cm✓

11.1 Techniques to change DNA of tomato plant

11.1.1 TWO other methods

- Micro-injection ✓
- Gene gun/biolistic ✓
- Agro-bacterium tumefaciens ✓
- Electroporation ✓
- Recombination DNA ✓
- Calcium phosphate precipitation ✓
- Gene silencing ✓
- Gene splicing ✓

- Lipofection ✓

(Any 2)

11.1.2 **TWO disadvantages of DNA modified tomatoes**

- Health concerns/allergies ✓
- Not enough research has been done ✓
- Expensive ✓
- Super weeds develop from tomato pollen ✓
- Religious beliefs ✓

(Any 2)

11.2 **Genetically modified sorghum**

- 11.2.1
- Enriched with vitamins ✓
 - Balanced in terms of nutrition/prevent malnutrition ✓
 - To alleviate the problem of poverty/hunger in Africa ✓
 - Improve cultivars

(Any 2) 2

- 11.2.1
- GM sorghum will be vitamin enriched (packed) ✓
 - to help fight malnutrition ✓

(2)

11.2.2 **Dangers of GM food**

- GM food risk destabilising the environment ✓
- GM food risk destabilising food production ✓

(2)

Genetic engineering/biotechnology/Genetic manipulation ☐ ✓

- Rapid improvement of genetic make up ☐ ✓
- Built in DNA from another organisms to manipulate characteristics ☐ ✓
- Change the genetic make-up of a plant ☐ ✓
- Change/improve the characteristics of a plant cultivar ☐ ✓ (Any 2)

A Desired gene inserted into plasmid ☐ ✓

B Plasmid inserted into plant cell/disabled to prevent them from causing disease in the recipient plant ☐ ✓

C Plasmid inserts desired gene into plant DNA/Used as a carrier to transfer a piece of its DNA into the chromosome of a plant ☐ ✓

D Tissue culture is then formed/Plant pieces are then grown into whole ☐ ✓

- Reduce the need for chemical spraying/herbicides ☐ ✓
- Tolerant to extreme conditions(cold, drought, salinity)✓ ☐

MARKETING

1.1.1 B transportation
C packaging

1.1.2 Provide information about the product/identification ✓
Convenient for handling/containment ✓
Biodegradable/recyclable ✓
Free from chemicals/foreign objects ✓
Protection against mechanical damage ✓

1.1.3 Job creation✓
Value adding✓
Improving shelf life✓
Way of overcoming wastage✓
Reduction of oversupply✓
Farmers receive fair price for their produce✓
The product must fit well in the container✓
The package must display the brand✓

1.1.4 Protection of produce✓
Identification of product✓

1.2.1 Packaging✓

1.2.2 Storage✓

1.2.3 Processing✓

1.2.4 Distribution✓

2.1 The activity or business of promoting and selling products or services, including market research and advertising. ✓✓

2.1.2 a) Marketing✓

b) selling✓

c) selling✓

d) Marketing✓

e) Selling✓

3.1 1 Demand The quantity of produce consumers are will and able to buy at a specific price and time✓✓

3.1.2 Supply The quantity of a good that producers are willing to sell at a given price and time.✓ ✓

3.1.3 The Law of Supply- As price increases, the quantity of goods sold increases.✓✓

3.1.4 Market Equilibrium- A point on demand and supply curve when demand and supply are equal✓✓

3.1.5 As price increases✓, the quantity of goods bought decreases. ✓

Activity four

4.2.1 A✓

4.2.2 A✓

4.2.3 C

4.2.4 D

4.2.5 C

Activity 5

5.1.1 Price inelasticity of demand✓

5.1.2 The demand changed slightly despite the huge change in price ✓

5.1.3 Maize meal is a necessity/staple food ✓ people will therefore buy maize meal even with a price increase ✓

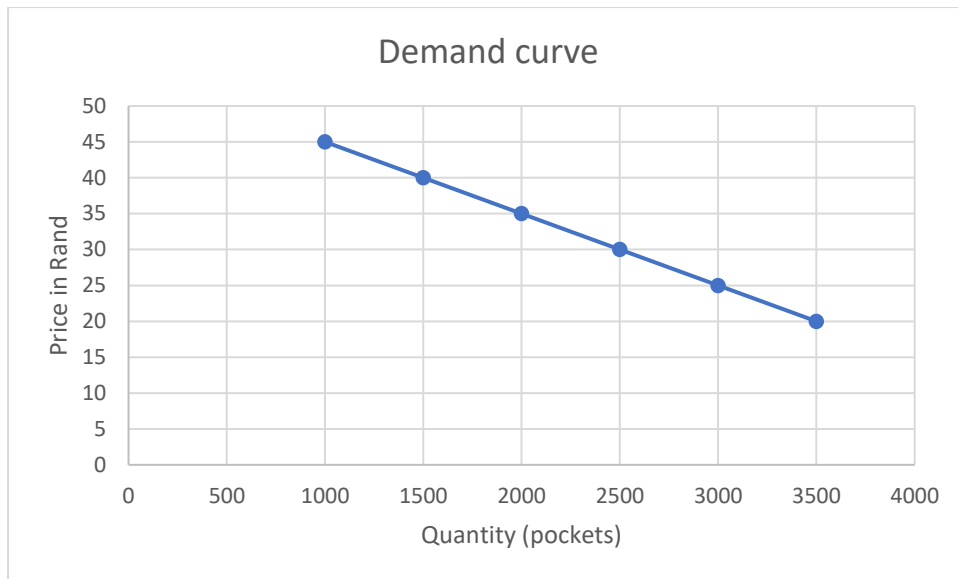
5.1.4 Sorghum✓

Wheat✓

5.1.5 Cheese✓

Butter✓

6.2.1 Graph of demand curve



Criteria for marking graph

- Title- demand curve ✓
- Line graph ✓
- Y axis correctly calibrated and labelled Price ✓
- X axis correctly calibrated and labelled Quantity ✓
- Units (R and pockets) ✓
- Accuracy (80% points correctly plotted) ✓ (6)

6.2.2 The quantity of fruits bought decreased as price increased ✓✓ (2)

ACTIVITY ^

- 1.3.1 Cooperative marketing✓
- 1.3.2 Barter✓
- 1.3.3 Marketing✓
- 1.3.4 Processing✓
- 1.3.5 Buyer✓

2.2.1 a) A✓

b) B✓

The Law of Supply- All other things being equal, the higher the price✓, the higher the quantity producers are willing to offer for sale. ✓ (1)

2.4.4 It is when producers pool their products and market them through the cooperative society. ✓ (1)

Activity 3

1.3.1

- a) Farm gate marketing
- b) Auction
- c) Internet marketing
- d) Fresh produce market✓

1.3.2 There is market risk to the producer✓

Price fixing may occur✓

There is greater fluctuation in price✓

(2)

2.1 1 Free marketing✓

2.1.2 Producers sold vegetables from door to door✓

Each individual was responsible for their own sales✓

2.2 1 Cooperative marketing✓

2.2.2 Good are pooled together and sold ✓

2.2.3 Lower marketing costs✓

More bargaining power✓

Access to funding/credit✓

Services are supplied cheaper✓

2.2.4 High transport costs✓

Lack of capital✓

Seasonal character of production✓

Accidents, theft and spoilage along the marketing chain✓

Bulkiness in relation to its value✓

3.2.1 Agribusiness marketing chain✓

3.2.2 Spoilage✓

Theft✓

3.2.3 Provide good road infrastructure ✓

Provide capital ✓

Provide security✓

Provide storage facility✓

4.2.1 Helps manager to think through the financial details✓

Helps define goals✓

Helps manager to plan for capital requirements✓

Help secure funding from financial institutions✓

Provides guidelines for decision making✓

4.2.2 The title page✓

Content page✓

Executive summary✓

Production plan✓

Financial plan✓

The human resource plan✓

Business concept✓

The marketing plan✓

4.2.3 Insufficient research✓

Hiding risks and weaknesses

Using incorrect format✓

Setting unrealistic goals and assumptions✓

Insufficient technical details✓

4.3.1 Weakness✓

4.3.2 Threat✓

4.3.3 Threat✓

4.3.4 Threats✓

4.3.5 Threats✓

4.3.6 Threat✓

4.3.7 Strength ✓

4.3.8 opportunity✓

4.3.9 Opportunity✓

4.3.10 Threat✓

4.3.11 Opportunity✓

4.3.2 Weakness

4.4 1

A Strength✓

B Opportunity✓

C Weakness✓

D Opportunity✓

E Threat✓

F Opportunity✓

4.4.2 A farmer may grow carrots on the arable land with irrigation to make profit. ✓

8.1.1 Identification of an opportunity✓

Evaluation of the opportunity✓

Determining the resources needed. ✓

8.1.2 Passion and positive attitude✓

Strong leadership skills✓

Self control✓

Creative and innovative thinking✓

Risk taker

8.2.1 B

8.2.2 Works for himself ✓

Has an appetite for risk✓

Always looking for new business ventures✓

(1)