

G.C.E. A/L Support Seminar - 2015
Agricultural Science - Paper I
Answer Guide

Question Number	Answer	Question Number	Answer
(1)	2	(26)	3
(2)	3	(27)	4
(3)	5	(28)	3
(4)	3	(29)	5
(5)	1	(30)	2
(6)	5	(31)	4
(7)	4	(32)	2
(8)	5	(33)	4
(9)	2	(34)	1
(10)	4	(35)	2
(11)	4	(36)	4
(12)	1	(37)	3
(13)	2	(38)	3
(14)	5	(39)	1
(15)	5	(40)	3
(16)	4	(41)	3
(17)	2	(42)	2
(18)	3	(43)	3
(19)	3	(44)	5
(20)	1	(45)	2
(21)	4	(46)	1
(22)	5	(47)	3
(23)	2	(48)	5
(24)	1	(49)	4
(25)	2	(50)	1

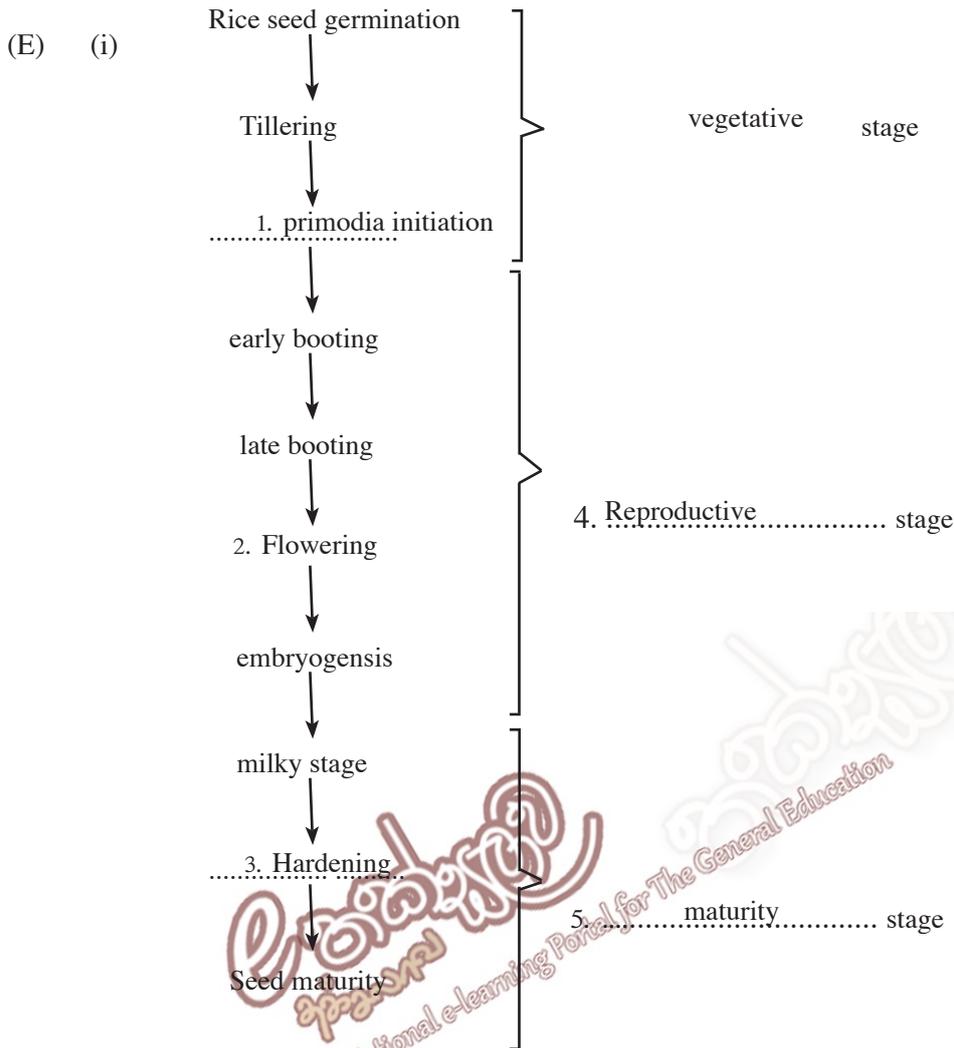
marks $1 \times 50 = 50$

Answer Guide

Part A - Structured Essay

- 1 (A) (i) a. Coffee
b. Rubber
 Sincona
 Tea (Marks 4 × 2 = 8)
- (ii) a. Construction of road network
b. in come geuration/ Created employment opportunities.
 development of plantation economy
 started railway transportation (Marks 4 × 2 = 8)
- (iii) a. ornamental plants
b. Cut flower
c. Water (aquatic) plants/ Vegetables/ Fruits (Marks 2 × 3 = 6)
- (B) (i) A - still well
B - Evaporation pan
C - Wooden Frame (Marks 2 × 3 = 6)
- (ii) To measure the high of the water level accurately (Marks 4)
- (iii) 25cm (Marks 4)
- (iv) a. Establishment on a wooden frame
b. Cover by a net (Marks 4 × 2 = 8)
- (v) add the reading of the rain gauge to the reading of the evaporation plate (Marks 4)
- (C) (i) a. Erythrina
b. Crotalaria
c. Gliricidia
d. Albecia/ Sunhemp (Marks 2 × 4 = 8)
- (ii) to add Nitrogen to the soil (Marks 4)
- (iii) a. C/N ratio of the leaves
b. soil moisture
c. soil temperature/ soil pH/ soil air/ activity of soil microorganisms (Marks 4 × 3 = 12)
- (D) (i) a. soil resistance
b. bulk density (Marks 4 × 2 = 8)
- (ii) a. disc plough
b. moulboard plough (Marks 4 × 2 = 8)
- (E) (i) Separation of harvest based on size, shape, colour or texture is known as grading (Marks 4)
- (ii) a. able to obtain high price for harvest
b. increase the quality of the harvest/ reduce post harvest losses (Marks 4 × 2 = 8)

- 2 (A) (i) a. crop unit
b. grasses/ forages unit
c. animal husbandry unit/ energy unit (Marks 2 × 3 = 6)
- (ii) Recycling (Marks 4)
- (iii) a. does not release waste to the environment/ minimized environmental pollution.
b. maintain as organic farms (Marks 4 × 2 = 8)
- (B) (i) Field Capacity (Marks 4)
- (ii) A - Water source
B - Filter
C - Main tube (Marks 2 × 4 = 8)
- (iii) a. Shallow, spreaded root system/ high copital cost
b. Plant are vulnerable to wind and drought
c. possibility to clog the emitters (Marks 4 × 3 = 12)
- (C) A. Budding point is too close to the soil surface
B. Bud is wrapped from the top to the bottom
C. immergence of a bud from the root stock (Marks 4 × 3 = 12)
- (D) (i) a. Can obtain a uniform crop
b. no weeds/ reduced soil erosion
c. Can get vigorous plants
d. Can get a good quality harvest (Marks 4 × 4 = 16)
- (ii) 1. Purity % = $\frac{(500 - 7)}{500} \times 100$
 $= \frac{493}{500} \times 100$
 $= \underline{\underline{98.6\%}}$ (Marks 4)



(Marks 2 × 5 = 10)

(F)

Number	Observation	Reason
1.	growth of lateral buds	absence of auxins production due to the removal of the shoot tip
2.	growth of lateral buds	influence of auxins is removed as the shoot tip is removed (no auxin production took place)
3.	No lateral bud growth	although shoot tip is unavailable auxins are available through agar block.
4.	No lateral bud growth	auxins are present as shoot tip present.

(Marks 2 × 8 = 16)

- 3 (A) (a) (√)
 (b) (×)
 (c) (×)
 (d) (√)
 (e) (×)

(Marks 2 × 5 = 10)

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- (B)(i) (a) P - Production possibility curve
 Q - ISO - cost line (Marks 4 × 2 = 8)
- (b) The boundary that shows the maximum possible production with the available technology (Marks 4)
- (ii) (a) B (Marks 4)
- (b) Paddy - Y_2
 Maize - X_2 (Marks 2 × 4 = 8)
- (iii) Product - Product relationships (Marks 4)
- (C)(i) Noridoko Nursery / blocking nursery (Marks 4)
- (ii) (a) Compost
 (b) Top soil (Marks 2 × 4 = 8)
- (iii)(a) no damages to the root system
 (b) easy to transport (Marks 4 × 2 = 8)

(D)

	Order	Mouth	Example for insects
A	1. Coleoptera.....	Chewing and biting	2. black Coconut Weevil.....
B	3. Diptera.....	4. Piercing and Sucking lapping moping....	
C	5. Lepidoptera.....	6. Piercing and sucking	Citrus butterfly
D	Hymenoptera	7. Chewing and biting/ biting, laping	8. Honey bee, wasp.....
E	9. Hemiptera.....	Piercing and sucking	10. Paddy bug/ pentafomid... bud/ red cotton bug

(Marks 2 × 10 = 20)

- (E)(i) a - As the CO_2 Concentration in the protected house is high photosynthesis is increased.
 b - low pest and disease incidences.
 c - As the temperature and humidity inside the protected hose is high, increase the rate of metabolic reactions/ less yield losses as the environmental factors can be controlled. (Marks 4 × 3 = 12)
- (ii) Anthurium - Net house
 Rose - Poly tunnel (Marks 2 × 2 = 04)
- (iii)(a) Strawberry
 (b) Cherry
 (c) Tomato (Marks 2 × 3 = 06)
- (iv) drip irrigation (Marks 4 × 1 = 04)

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- 4 (A) (i) A - Primary follicular cells/ Primary follicles
 B - Ovum (ovulated)
 C - Grafian follicle
 D - corpus leutium (Marks 4 × 4 = 16)

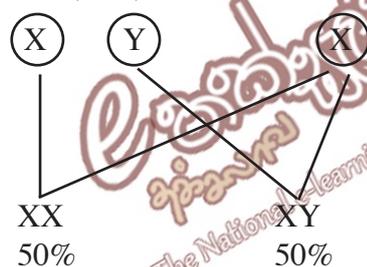
- (ii) Hormone - Projesteron
 Action - maintain pregnancy (Marks 4 × 2 = 08)

- (iii) a) FSH - Follicle Stimuilating Hormone
 b) LH - Leutenizing Hormone (Marks 4 × 2 = 08)

- (B) (i) 50% flowering stage (Marks 04)
 (ii) anaerobic condition/ 27 - 37°C (Marks 04)
 (iii) Microorganism - Lactobacillus
 Cheanical - Lactic Acid (Marks 4 × 2 = 08)

- (C) (i) Upgrading up to a superior breed (e 04)
 (ii) a - suppress recessive weak charactors
 b - cost effective (Marks 4 × 2 = 08)

- (iii) XY (Bull) × XX (Cow)



or

	X	Y
X	XX	XY
X	XX	XY

(Marks 04)

- (iv) 3 F₁ 50% (Marks 04)

$$F_1 \quad 50\% + \frac{50}{2}\% = 75\%$$

$$F_1 \quad 75\% + \frac{25}{2}\% = 87.5\%$$

- (D) (i) (a) (body) cell growth
 (b) repair worn cells and tissues/ heamoglobin production/ stimulate metabolic activities/ antibody production/ as an energy substrate. (Marks 4 × 2 = 08)
 (ii) The amount of essential amino alids present in a protein (Marks 04)
 (iii) They are low in essential amino alids (Marks 04)

- (E) (i) (a) Low Density polyetheline
 (b) High Density polyethelene - HDPE
 (a) Polypropylene
 (b) Polyetheline Terithalile - (PET) (Marks 4 × 4 = 16)

Essay Type

(1) (i) Introduction for agricultural Development

(5 Marks)

Relevant Factors

- * Presence of inputs for agricultural
Ex:- Land, Labour, Fertilizer, anarchically
- * Demand for the agricultural products
- * Government Support
Ex:- agricultural Products, Fertilizer subsidy
- * Infrastructure Facilities
Ex:- Transport facilities
- * Technological development
Ex:- Mechanization
- * New Techniques to access the market information.
Ex:- Internet Services, E marketing
- * Expansion of export Market
Ex:- Cut flowers, Ornamental Plants, Preserved food
- * Extension and advisory Services
Ex:- Agricultural Department, Private institutes
- * Agricultural related industries

(5 marks x 9 = 45)

(ii) air layering introduction

(5 marks)

Wedgc grafting introduction

(5 marks)

Air Layering

- (1) Selection of a semi hard wood part of a branch that cannot bend to a ground level.
- (2) Remove a 5 - 8 cm Circular bark or put a cut close to a node and insert a small stone.
- (3) Apply the rooting hormone to the cut surface.
- (4) Place moisten Coirpith or Compost/ Coirprith mixture to cover the cut surface and cover by a Polythene strip (aluminium fail or tripple laminated paper also can be used)
- (5) If rooting is present, after 3 - 4 week put a angle cut close to the mother plant and separate the newplant.
- (6) plant the rooted branch in a black polythene pot filled with compost and top soil mixture. Then apply water and keep under shade.

(5 steps - Marks $3 \times 5 = 15$

(figure - 05)

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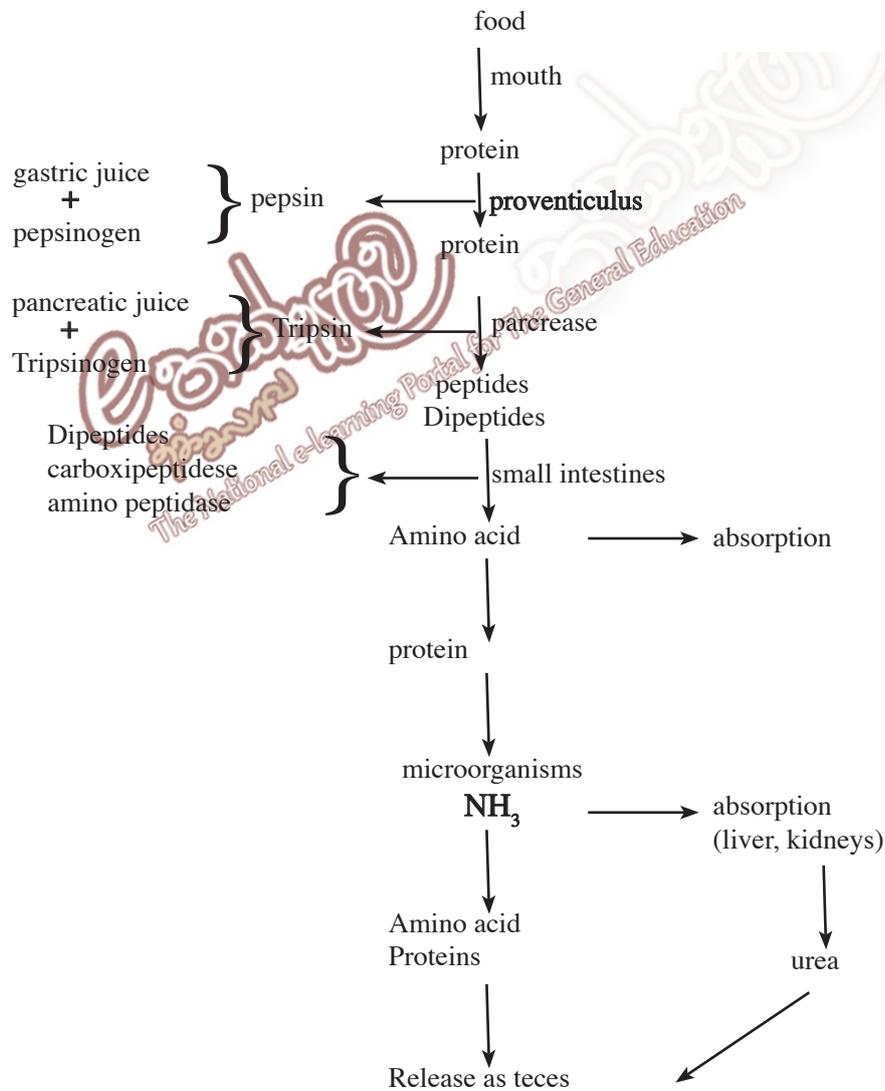
Wedge grafting

- (1) Grow the stock plants in a nursery (Plant them in nursery Pots)
- (2) Separate a around 15cm long shoot an the section from a mother plant as the scion.
- (3) Cut the stock Plant at 20 - 25 from the ground Level. (A horizontal cut)
- (4) Prepare the stock by splitting the stock vertically from the center of the stem for 5cm length. The cut should be sufficient to insert the Seion.
- (5) Insert the vedge shape scion through the split and tightly wrap by budding tapes from down to up word enabling cut surface bind tightly.
- (6) Keep the plant under shade and supply water.

(5 steps - Marks $3 \times 5 = 15$)
(figure - 05)

(iii) Introduction of digestive system of towl

(10 marks)



To describe 8 steps -
 $5 \text{ marks} \times 8 = 40$

- (2) (i) Introduction for fertilizer application 10 marks
- broadcasting
Scatter uniformly throughout the field by hand or machines
Ex - paddy cultivation
 - Deposit around the plants in a circular manner.
 - apply/ Deposit fertilizer around the plant as a semi circle
 - Deposit in several places around the plant
 - Deposit between two rows of plant
 - Deposit as a strip between two rows of plants.
 - apply directly on plants as a foliar spray
 - dissolve in the irrigation water and supply (Fertigation)
- 8 marks × 5 facts = 40 marks

- II) Introduction for soil aeration
The air transfer between the soil pore spaces and atmospheric air
(10 marks)

Importance

- to maintain the nutrient availability
increase the nutrients availability in non - toxic forms
Ex - Manganise and Iron found in Mn^{3+} , Mn^{4+} and Fe^{3+}
- When Mn^{4+} and Fe^{2+} present under anaerobi conditions, they are easily absorbed and become toxic. But to reduce the toxicity of Fe^{2+} and Mn^{4+} soil aeration is important.
- In well aerated soils, sulfer is found in sulfate SO_4^- form. They can be absorbed by the plants.
But with poor aeration, hydrogen sulfide and methane like harmful gasses are formed.
- Aeration is important for aerobic bacteria to degrade. Organic matter .organic nitrogen and phosphorus degraded and become easily available to plants. (symbiotic and asymbiotic fixing take place)
- Denitrification occurs under poor aeration and nitrogen is removed from soil. Aeration is important to reduce denitrification.
- Root system is well developed under good soil aeration root hairs are developed well.
- The respiration process that provide energy to absorb water and nutrient, function well under aerated Conditions.
- Plants become more vulnerable to diseases under poor soil aeration
Ex - pusarium loke fungi spread lake blight among citrus plants under poor aeration.
- soil aeration is important to seed germination

(Eight facts with 05 marks = 40)

- iii) Describe the steps involve in the laboratory experiment that conduct for the identification of soil nematodes

Material required :

- Funnel
- rubber tube (transparent)
- Clamp
- Stand

- soil samples
- filter papers
- water
- microscope
- beakers
- glass slides and cover slips. (05 Marks)

1. Obtain a soil sample from the field
2. perform the Burman funnel test
 - Fix the funnel to the stand
 - Fill the funnel with water
 - Place the filter paper in the funnel
 - Place the soil sample on the filter paper kept in the funnel
 - The water found in the lower part of the funnel put in to a shallow glass container
 - take a drop of water from the container in to the slide and examine through the microscope
 - Observe whether the nematodes with stylet present
 - If the nematodes bearing stylet present observed, it confirms the presence of parasitic nematodes in the soil sample.

(Marks $5 \times 9 = 45$)

- (3) (i) 1. Select healthy, well grown plants from the existing crop
2. The fruits bearing at the start or end of the crop and disease affected are not considered.
 3. Leave the fruits to mature in the plant.
 4. Use appropriate methods to separate seeds from the fruits.
 5. Follow the seed separation techniques according to the crop.
 6. Washed seed keep on a cloth until drain and remove the water.
 7. Dry in the sun around 12 hours to reduce the moisture content.
 8. Air dry for several days.
 9. Store under cool condition.

(5 marks \times 8 steps = 40)

- (ii) Introduction - Agricultural Marketing (10 marks)
Special Characters

- Presence of large number of small and large scale producers.
- The small scale producers are poor in bargaining power.
- Majority of the agricultural products are essential consumer goods (limited substitute goods).
- Intermediaries or the middlemen are more powerful than farmers in deciding the prices of agricultural products.
- As the climate directly affects the agricultural production, there is no continuous and year round production.
- The price of the agricultural products often fluctuates.
- As the agricultural products are affected by natural influences such as droughts, floods, pests and diseases, the production is insufficient to meet the demand.
- As a lot of small scale producers are involved, the quality of the products fluctuates.
- Little knowledge of producers about marketing.
- Both producers and consumers are distributed in a vast range (area).
- The perishable nature and the difficulty to keep longer durations.

(5 marks \times 8 = 40)

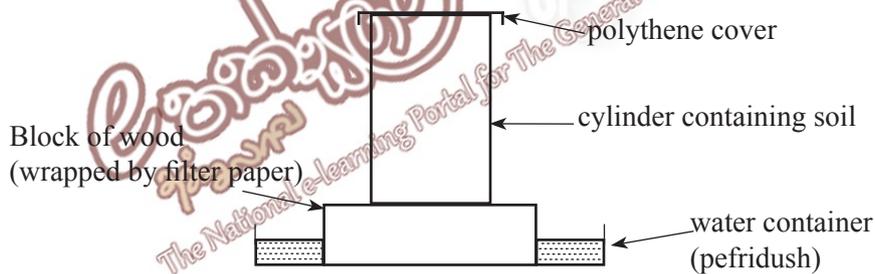
(iii) Procedure to determine the field capacity of a soil sample

material needed :

- Soil sample
- soil auger / a cylindrical bottom removed container / piece of PVC tube (both ends sharpened)
- petri dish
- Piece of polythene
- rubber band
- filter papers
- wooden block
- stove
- balance
- desiccator

Method :

- Obtain the soil sample
- measure the weight of the cylinder (M_1g)
- Place the cylinder on the soil surface, and keep a wooden block on the cylinder and beat with a hammer. A soil auger, empty container or portion of PVC tube can be used in the same way to obtain soil samples.
- Remove soil outside the cylinder by a sharp knife
- slide the knife against the top and the bottom of the cylinder to form a flat soil surface
- cover the soil samples by a piece of polythene until transport the sample from field to the laboratory



- As depicted in the above figure, keep the cylinder which contains the soil sample on a wooden block wrapped by filter papers. Then place them in the water container
- Keep the sample for around two days until it reaches a constant weight and measure the weight (M_1g)
- Measure the weight of the evaporation dish (W_1g)
- Place the soil in the cylinder in the evaporation dish and keep in an oven set at $105^\circ C$ temperature, until it reaches a constant weight (W_2g)
- Calculate the field capacity of the soil, using the following formula

$$\text{field capacity} = \frac{(M_2 - M_1)g - (W_2 - W_1)g}{(W_2 - W_1)g} \times 100$$

(Introduction - field capacity - 5 marks)
(figure - 5 marks)
(material required - 5 marks)
(description 7 step \times 5 = 35 marks)

(4) (i) Introduction - Agro - Forestry

It is a diversified crop management system with various biological components which use the land economically and agriculturally more productive while optimally maintaining the balance of a forest.

(10 marks)

soil conservation by agro forestry

- ★ reduce soil erosion, soil and water conservation through mulching.
- ★ As the organic matter is added to the soil through plant and animal wastes, soil and water is conserved.
- ★ soil receive nitrogen through N fixing by legume crops.
- ★ multi - layer crops prevent direct fall of water on the ground and therefore reduce runoff and soil erosion.

(Marks $2 \frac{1}{2} \times 4$ facts = 10 marks)

Water conservation

- ★ multi - layer crop add organic matter in to soil and therefore increase, the water absorption and water holding capacity
- ★ Reduce evaporation through mulching.
- ★ Recharge of ground water through infiltration.
- ★ Reduce evaporation of water as the temperature is regulated by the plant population.
- ★ Functioning of natural hydrological cycle.

(4 facts \times 2.5 marks = 10 marks)

Nutrient Conservation

- ★ Fertilize soil as organic matter added to the soil
- ★ Nutrients are conserved as erosion is minimized
- ★ animal manure is added to the soil as animal husbandry is a component
- ★ Translocation of nutrients due to multi - layer cropping.
- ★ As soil organisms get favourable conditions, organic matter decomposition is better.

(4 facts \times 2.5 marks = 10 marks)

Bio diversify conservation

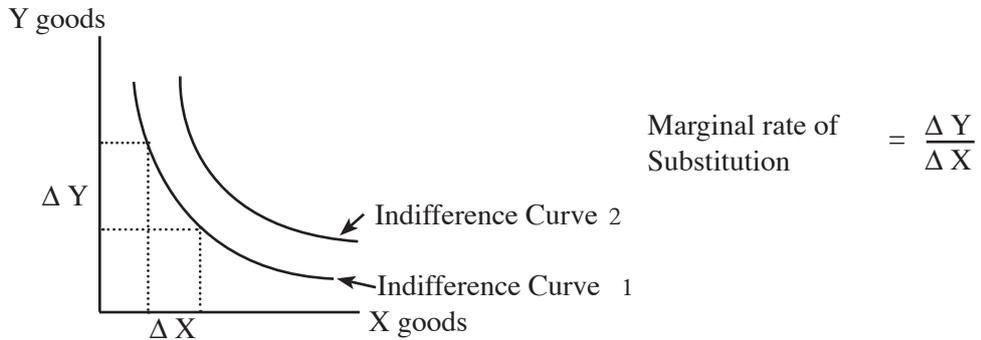
- ★ as soil organisms get favourable condition, they are protected
- ★ animals / birds and others get shelter and food
- ★ ability to maintain food chains
- ★ ability to maintain biological stability / balance

(4 facts \times 2.5 marks = 10 marks)

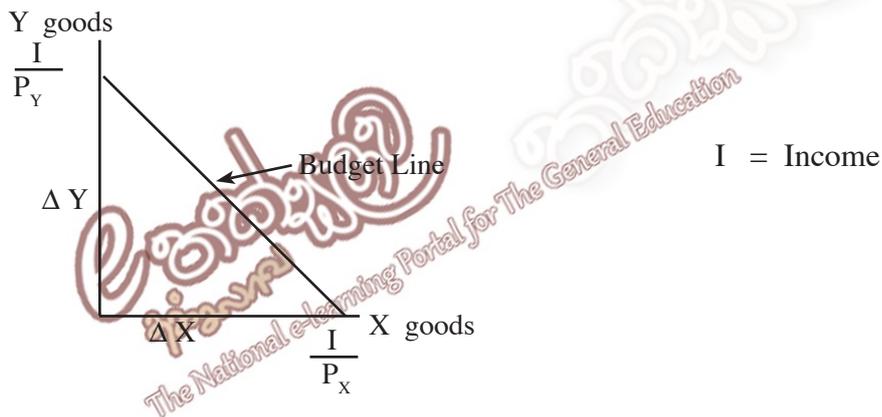
- (ii)
- The ordinal utility approach explains that the agreement of the consumer's utility due to consumption of goods. The indifference curves are used for this purpose.
 - Indifference curve is a curve on a graph (the axes of which represent quantities of two commodities) linking the combination of quantities which the consumer regarded as of equal value.
 - Utility is equal at any point of the indifference curve. Therefore, consumer need to reduce the consumption amount of one good to when increasing the consumption of the other good to maintain the same level of satisfaction.
 - In other words, when increase the consumption of one good, consumer should reduce the

consumption of the other good to maintain the same level of satisfaction. This is called as marginal rate of substitution (MRS).

- Slope of the indifference curve illustrates the MRS



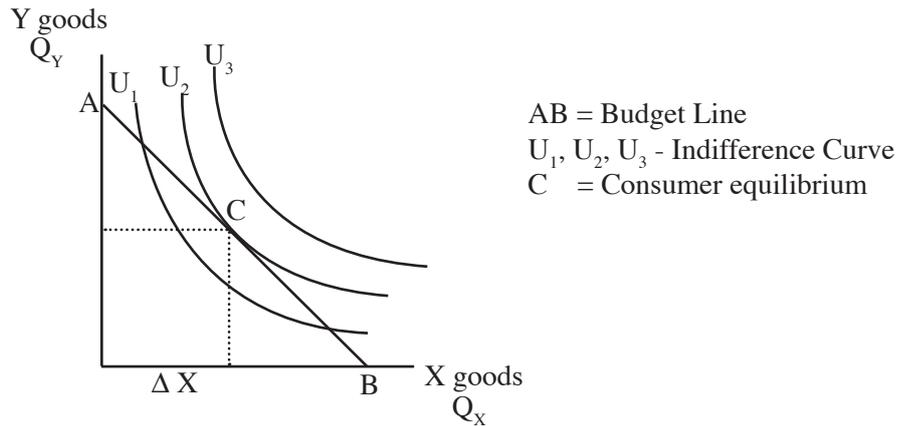
- Consumer always prefers to move for higher indifference curve from lower indifference curve. But it depends on the price of the goods and consumer's income.
- Budget line shows the maximum purchase amount of either X or Y good or different combinations of X and Y of the consumer.



$$\begin{aligned}
 \text{Amount of Y Purchase} &= \frac{I}{P_Y} \\
 \text{Amount of X Purchase} &= \frac{I}{P_X} \\
 \text{MRS} = \text{Slope of the Curve} &= \frac{\Delta Y}{\Delta X} \\
 &= \frac{\frac{I}{P_Y}}{\frac{I}{P_X}} = \frac{I}{P_Y} \times \frac{P_X}{I}
 \end{aligned}$$

- At equilibrium Level, MRS equal to the, difference of price.

$$\text{MRS} = \frac{P_X}{P_Y}$$



- Maximum utility receive from the maximum indifference curve which touches the budget line. This touching point is called as consumer equilibrium. In this point, slope of both curves, indifference curve and budget line is equal.

3 graphs 5×3 marks = 15

Introduce utility curves 5 marks

Introduce Budget line 5 marks

Explain consumer equilibrium 25 marks

- (iii) The long term clear and continuous changes in weather parameters such as temperature, rainfall due to human activities or natural processes.

(10 marks)

- Contribution of the agriculture sector
 - ★ Efficient water management
 - use irrigation system with minimum water losses
Ex - drip irrigation, sprinder irrigation.
 - rain water conservation
 - minimize evaporation through mulching.
 - ★ Increase fertilizer efficiency
 - minimize green house gasses which release to the environment
 - ★ Remve CO₂ From the atmosphere through tree planting programmes
 - ★ Introduce new crop varieties that suitable for the environment
Ex - salt tolerant varieties, drought resistant varieties, pest and disease resistant varieties temperature resistant varieties.
 - ★ adoption of soil conservation methods
 - minimize the impact on hydrological cycle through water conservation.
 - ★ provide animal feeds with higher feed conversion efficiency to the livestock
 - minimize methane production
 - ★ Forest plantations in marginal lands.
 - ★ Use of renewable energy sources to meet the energy demand of the farm
Ex - wind mills, solar power, bio gas, sea waves
 - ★ Use of environmental friendly farming systems

- organic farming, conservation farming minimize the use of agro chemicals.

★ Use of suitable strategies to reduce methane emission from paddy fields and ill drain sails

- planting trees, use of drainage systems

(8 facts × 5 marks = 10 marks)

(5) (i) Introduction - epidemic level of pest (10 marks)

The way an insect pest come to an epidemic level .

Due to various pest population exceed the economic threshold level

- Enter from another environment.
- Death of natural enemies due to excessive use of pesticides.
- Occurrence of more virulent strains due to gene mutation.
- Because of the excessive use of fertilizer, plant parts become fleshy and more susceptible to pests.
- High yielding new varieties are low in pest resistance
- Occurrence of resistant strains due to continuous use of pesticides
- emergence of pesticide resistant pests due to inappropriate management activities
- Due to the availability of food and favourable climatic conditions, fast growth and multiplication of pests

description of eight facts × 5 marks = 10 marks)

(ii) Procedures to minimize the post-harvest losses of mango

- harvest between 10.00 am - 3.00 pm - as it reduce the secretions, the damages due to burning the fruit skin is reduced.
- Use of proper tools - to harvest mango fruit - use a secateur or a sharp knife to hand plucking.
- at harvesting, leave a portion of the stalk of the fruit and cut at the distant end of the stalk - It reduce the secretion of latex
- Prevent mango harvesting on the ground - It reduce the contact of fruits with soil.
- Harvest the fruits in to a gunny bags or sac to prevent the damages.

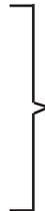
5 facts × 10 marks = 50 marks

(iii) Introduction to milk let down (5 marks)

Drawing the figure/ sketch (5 marks)

Name the following parts

- alveoli
- glandular lobes
- milk duct
- Gland cistern
- Test cistern
- Test cannal



labeling 6 parts = 6 × 2 = 12 marks

Milk let down process

- stimulate the animal
- stimulate Hypothalamus
- stimulate the posterior pituitary
- secretion of oxytocin
- contraction the alveoli
- store the milk in teat cistern which flow through small milk ducts, large milk ducts and gland cistern

(5 steps × 10 marks = 25 marks)

(6) i) Lipids - introduction

(10 marks)

Function of Lipids

- **Conserve body temperature.**
Bound as a layer of fat underneath the skin and conserve the internal body temperature protect the body from the temperature fluctuations in the environment.
- **Function as a energy substrate in the body.**
Generate lot of energy therefore, it can be used to reduce the bulkiness of a meal.
- **Serve as a Vitamin Carrier.**
As Vitamin K, A, D and E Soluble in fat, fat is needed to transport these vitamins inside the body.
- **Supply essential fatty acids.**
Fat provides essential fatty acids which required for proper growth, function of blood vessels and nerves. Essential fatty acids are unable to synthesize inside the body.
- **Function as a Lubricant.**
Fat serve as a lubricant for the internal organs and reduce the friction between organs. Protect organs like kidneys and heart by absorbing shocks.
- **Forms membranes in Organeils.**
Contribute for the structural function like the formation of cell membranes.
- **Produce Cholesterol in the body.**
Cholesterol is important for the brain growth of children, production of sex hormones, maintain mussel tissues healthy and transport some vitamins throughout the body.

5 facts to be × 10 marks × 8 marks each /
labeling 3
description 5

ii) Soil reaction

The alkalinity or acidity is known as soil reaction.

- nutrient availability.
- microbial activity.
- dispersal of soil particles.

(2 facts to be described x 5 marks each = 10)

- Cation exchange (2 marks)
The exchange of the cations desolve in the soil solution and the cations adsorbed into the soil alkalinity is known as cation exchange.

- Soil fertility.
- Reduction of leaching through holding the nutrients.
- Correction of acidity and basic conditions.

(2 facts to be described x 5 marks = 10)

- Base Saturation (2 marks)
The prapotion of basic cation as a percentage to the total cation present in the cation exchange complex is known as base saturation.

(3 marks)

- get to know the soil fertility.
- make correction in the soil alkalinity or acidity.

(1 fact to be described x 5 marks = 10)

- Electrical Conductivity (2 marks)

The ability to pass a current is measured by the electrical conductivity.

(3 marks)

- get to know the salinity or basic condition of a soil and to do reclamation to bring the soil back to cultivation.

(1 fact to be described x 5 marks = 10)

III) Introduction - Photosynthesis (10 marks)

Stratagies to improve the photosynthesis efficiency at field level.

- Provide optimum spacing and thereby prevent mutual shading and wastage of land space.
- grow shade loving crops among light loving corps (multi- layer cropping)
- Train vines in vacant places like stems frees.
- Remove competitive weeds.
- Trim / Prune the parts subjected to shade or competition.
- avoid limitation of other factors which affect photosynthesis in addition to the light.

(5 facts x 8 marks each = 40)