Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate 2012

Marking Scheme

AGRICULTURAL ECONOMICS

Higher Level

LEAVING CERTIFICATE 2012

AGRICULTURAL ECONOMICS

HIGHER LEVEL

MARKING SCHEME

AND

SUPPORT NOTES

Marking Scheme and Support Notes for use with the Marking Scheme

In considering the marking scheme the following points should be noted:

- The support notes presented are not exclusive or definitive.
- The support notes in many cases contain key phrases which must appear in the candidate's answer in order to merit the assigned marks.
- Further relevant points of information presented by candidates are marked and rewarded on their merits.
- The detail required in any answer is determined by the context and the manner in which the question is asked and by the number of marks assigned to the answer in the examination paper. Requirements may therefore vary from year to year.

PART I (120 Marks)

20 QUESTIONS – 15 QUESTIONS TO ANSWER.

ALL QUESTIONS CARRY EQUAL MARKS (8 MARKS)

Outline Marking Scheme

1.	8 marks (3 m + 3 m + 2 m)	**11**.	8 marks (4 m + 4 m)
2.	2 @ 4 marks each (2 m + 2 m)	**12.**	4 examples @ 2 marks each
3.	8 marks (3 m + 3 m + 2 m)	**13**.	2 @ 4 marks each
4.	8 marks (3 m + 3 m + 2 m)	**14**.	8 marks (3 m + 3 m + 2 m)
5.	2 @ 4 marks each	**15**.	2 @ 4 marks each
6.	8 marks (4 m + 4 m)	**16**.	8 marks (4 m + 4 m)
7.	2 @ 4 marks each (2 m + 2 m)	**17**.	2 @ 4 marks each (2 m + 2 m)
8.	2 @ 4 marks each (2 m + 2 m)	**18**.	2 @ 4 marks each (2 m + 2 m)
9.	8 marks (3 m + 3 m + 2 m)	**19**.	2 @ 4 marks each (2 m + 2 m)
10.	8 marks (4 m + 4 m)	**20**.	2 @ 4 marks each

PART II (200 Marks)

4 QUESTIONS TO ANSWER AT 50 MARKS EACH.

1.	**(a)**	Demand curves	8 marks (4 m + 4 m)	8
	(b)	Impact of increase in price	2 @ 8 m (4 m + 4 m)	16
	(c)	PED	2 @ 8 m (4 m + 4 m)	16
	(d)	Price inelastic: Domestic Demand Explanation	 2 marks 4 m + 4 m	 10

[50 marks]

2.	**(a)**	Diagram	6 marks (2 m + 2 m + 2 m)	6
	(b)	Diagram & explanations:	3 @ 8 m [4 m (2+2) + 4 m (2+2)]	24
	(c)	Farm Profit v Family Farm Income	2 @ 10 m [5 m (3+2) + 5 m]	20

[50 marks]

3.	**(a)**	Diagram	5 marks (3 m + 2 m)	
		Discuss	10 marks (4 m + 3 m + 3 m)	15
	(b)	Diagram	5 marks (3 m + 2 m)	
		Discuss	10 marks (4 m + 3 m + 3 m)	15
	(c)	Diagram	8 marks (3 m + 3 m + 2 m)	
		Discuss	12 m [6 m (2+2+2) + 6 m (2+2+2)]	20

[50 marks]

4.	**(a)**	CAP objectives	20 marks (4 @ 5 m)	
		Evolvement	5 marks (3 m + 2 m)	25
	(b)	Instruments used	3 @ 5 marks (3 m + 2 m)	15
	(c)	Challenges	2 @ 5 marks each	10
				[50 marks]

5.	**(a)**	Uses of cash flow budgeting	2 @ 5 marks each	10
	(b)	Prices & Costs	4 @ 8 m [1m + 5m (2+3) + 2m]	32
		[*Trends* *Reasons* *Reference to cash flow*	*1m* *5m (2+3)* *2m*]	
	(c)	Meeting financial obligations	4 @ 2 marks each	8
				[50 marks]

6.	**(a)**	Contributions of agriculture	4 @ 7 marks each (4 m + 3 m)	28
	(b)	Free Trade:	8 m (4+4) + 8 m (4+4) + 3m + 3m	22
				[50 marks]

Support Notes 2012

PART I (120 marks)

1. **In Ireland there is approximately 4.95 million hectares of land used for agriculture and forestry. With reference to the given pie chart, identify the percentage of land used for each of the following (one entry is completed):**

Use	Proportion (enter answer)
Grass	67.9
Rough grazing	**9.3**
Crops	7.7
Forestry	15.1

2. **Distinguish between the roles of *Teagasc* and *BordBia.***
   Teagasc is the Agriculture and Food Development Authority, responsible for providing **research, advice and training services** to the agriculture and food industries and rural communities.
   BordBia is concerned with developing world wide markets for Irish suppliers in the food, drinks and horticultural sectors; to support growth, to assist the industry through investing in market development, promotion and information services and thereby help expand sales at home and abroad.

3. **Outline how prices are determined in a factor market.**
   On the factor market, **demand** for resources **from firms** interacts with the supply of resources from households to give prices such as land, rents, wages and interest rates. **Supply** of the factors of production emanates **from the household** (land, labour capital).

4. **Statistics/data from the CSO Farm Structure Survey 2007 show that in Ireland:**
   (i) there are approximately 90,000 / **128,000** / 180,000 farm holdings
   (ii) the average farm size is approximately **32** / 55 / 74 hectares
   (iii) the percentage of family farm holders over the age of 55 is 24% / 38% / **51%.**

5. **Define each of the following**:
   (i) **Economics**: the science of the allocation of scarce resources.
   (ii) **Economic growth**: the continued rise in the volume of a nation's output of economic goods and services. It is measured by the percentage increase in output over a 12 month period.

6. **State the purpose of the 'Food Harvest 2020' report:**
   The report was commissioned by the Department of Agriculture, Fisheries and Food to formulate a **medium development plan** for the Irish agri-food, fisheries and forestry sectors for the period until 2020. It outlines key actions needed to ensure that the sector contributes to the maximum possible extent to the country's export-led economic recovery. It sees the opportunity for the Irish agri-food industry to grow and prosper sustainably through the delivery of high quality, safe and naturally based produce. Competitiveness. Environmental sustainability. Consumer focus.

7. **State two implications for the Irish agri-food sector of the recent decrease in the euro exchange rate:**
   - Increased competitiveness of Irish agri-food exports in non-euro countries, such as UK, US and Asian markets (cheaper to buy Irish products). Weaker euro facilitates exports to non-EU countries.
   - Increased cost for many farm inputs that are imported from non-Euro areas, such as fertilizer costs. Weaker euro increases imported input prices feed, fertiliser and fuel.
   - Stronger Sterling means Irish food cheaper in UK – encourages exports to UK.

8. **Define the following terms:**
   (i) **Marginal revenue product**: The extra output produced / revenue earned when you employ one extra unit of a factor of production. It is the marginal product multiplied by the unit price of the product. MRP = MP x P_X
   (ii) **Law of diminishing marginal returns**: given that at least one factor of production is fixed in quantity, as more of a variable factor is added to the fixed factor in production, a point is reached were each additional unit of the variable factor will create less output than the previous unit. Factors are not varying proportionately.

9. **In relation to the following changes in the market for beef, state the effect of each change on the demand curve for beef:**

Change	Effect
1. An increase in the price of beef	**A.** A shift in the demand curve out and to the right
2. An increase in consumer income	**B.** A movement along the demand curve
3. A decrease in the price of pork	**C.** A shift in the demand curve in and to the left

Match the two lists by placing the letter of the correct effect under the relevant number below:

1.	2.	3.
B	**A**	**C**

10. **Engel's law states that**: higher income groups in society spend a smaller proportion/percentage of their total income on food than do lower income groups.

11. **To correct for time, values must be discounted. State the formula used to calculate the present value of €30,000 which you will receive in 7 years time.**

$$30{,}000 \;/\; (1 + \frac{r}{100})^7$$

with *r* being the rate of discount (e.g. 3%).

12. **State two examples of each of the following categories, with reference to Irish agriculture:**
   (i) **Fixed costs**: land, buildings, machinery, family labour.
   (ii) **Variable costs**: livestock, purchase feed, fertilisers, seeds, machinery operating costs, leasing, contractor fees, wages, casual labour.

13. Distinguish between *nominal prices* and *real prices*.

Nominal: Prices measured in euro (*i.e.* the current price of any product) are nominal prices.

Real: Real price is the nominal price corrected for inflation (using a base year as a reference). Nominal price divided by the CPI equals the real price.

14. On a typical farm account, output is defined as total sales less **purchases**, plus/minus **changes in inventory**, plus **household consumption** of own farm produce.

15. State two types of direct payments received by Irish farmers:

- Single farm payment
- REPS/AEOS
- Disadvantaged area
- Installation aid
- Disease eradication compensation

16. Outline the role of The European Commission within the EU:

The commission is the executive body of the EU. It is concerned with upholding the interests of the EU as a whole, which it does through

- proposing laws to the EU parliament
- overseeing the EU budget,
- enforcing EU law
- representing the EU internationally.

17. Outline two main categories of taxation which the typical farmer may be liable for:

- Income tax (related to income or profit)
- Purchases or sales tax (related to a person's amount of purchases or sales; includes VAT, excise duties, stamp duties and other levies.
- Capital taxes relate to the amount of wealth or property a person owns (includes capital gains tax, capital acquisition tax, car tax, rates).

18. What does the following data tells us about the agricultural products below?

(i) The price elasticity of demand for meat products is – 0.37:

The good is **inelastic**, meaning that for every one percent change in price, the quantity demanded will change by **less than** one percent (*i.e.* 0.37% in this case).

(ii) The cross price elasticity of demand between beef and lamb is + 0.66:

The goods are **substitutes**, meaning that they can be used for the same purpose. Therefore, there is a positive relationship between the price of one and the quantity demanded of the other (e.g. as the price of beef increases, people will demand a larger quantity of lamb).

19. Distinguish between the terms *liquidity* and *solvency* in farm accounts:

Liquidity refers to the ability of a farm to meet its day-to-day running costs by meeting the short-term demands of creditors. For a farm, it could be established by the ratio of liquid assets to current liabilities.
Solvency refers to the ability of a farm to meet all its debt obligations, including long-term debt. One of the ratios to establish the solvency of a farm is the total liabilities to net worth ratio.

20. State two benefits of environmental protection schemes such as REPS and AEOS:

- Establishes better farming practices and production methods which reflect the increasing concern for conservation, landscape protection and wider environmental problems
- Protects wildlife habitats and endangered species of flora and fauna
- Produces quality food in an extensive and environmentally friendly manner.

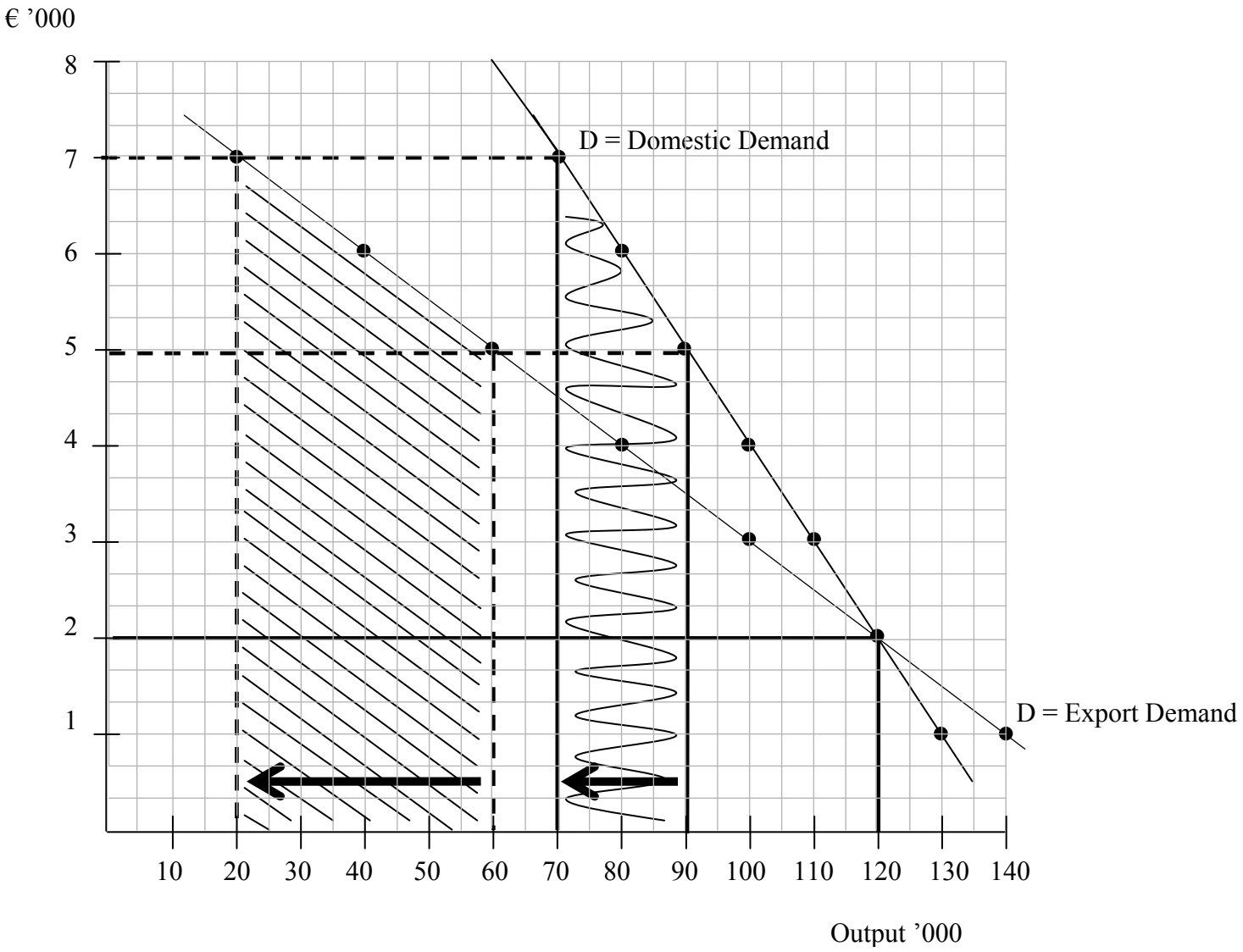
PART II (200 marks)

1. The table below shows the domestic and export demand schedules for Irish butter.

Butter price (€'000 per tonne)	Domestic quantity demanded at each price level ('000)	Export quantity demanded at each price level ('000)
7	70	20
6	80	40
5	90	60
4	100	80
3	110	100
2	120	120
1	130	140

(a) On a single diagram, construct domestic and export demand curves for Irish butter, from the data shown in the table above.

(b) State and show on your diagram the impact an increase in price of butter from €5,000 per tonne to €7,000 per tonne will have on the quantity of Irish butter demanded on both the domestic and export markets.



(b)(i) Quantity of butter on the export market will decrease from 60,000 tonnes to 20,000 tonnes (40,000 reduction).

(b)(ii) Quantity of butter on the domestic market will decrease by a smaller proportion, from 90,000 tonnes to 70,000 tonnes (20,000 reduction).

(c) Calculate the price elasticity of demand for Irish butter on both the domestic and export markets when prices increase from €5,000 per tonne to €7,000 per tonne.

Domestic Market: PED = $\frac{\Delta Q}{\Delta P} x \frac{P_1+P_2}{Q_1+Q_2} = \frac{-20}{2} x \frac{5+7}{90+70} = \frac{120}{160} =$ **– 0.75**

or PED $= \frac{\text{\% change in Quantity demanded}}{\text{\% change in Price}}$

$= \frac{Q_1-Q_2}{(Q_1+Q_2)/2} x \frac{100}{1} / \frac{P_1-P_2}{(P_1+P_2)/2} x \frac{100}{1} = \frac{20}{80} x \frac{100}{1} / \frac{-2}{6} x \frac{100}{1} = 25 / 33.3 =$ **– 0.75**

Export Market: PED = $\frac{\Delta Q}{\Delta P} x \frac{P_1+P_2}{Q_1+Q_2} = \frac{-40}{2} x \frac{5+7}{60+20} = \frac{12}{4} =$ **– 3.00**

or PED $= \frac{Q_1-Q_2}{(Q_1+Q_2)/2} x \frac{100}{1} / \frac{P_1-P_2}{(P_1+P_2)/2} x \frac{100}{1} = \frac{40}{40} x \frac{100}{1} / \frac{-2}{6} x \frac{100}{1} = 100/33.3 =$ **– 3.00**

(d) Identify which demand curve is price inelastic. Explain your answer.

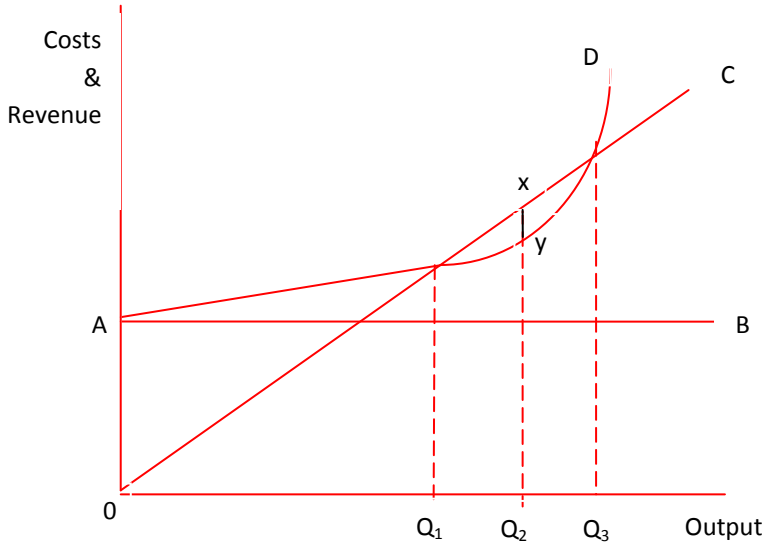
Domestic demand.

Rationale:

On the domestic market, consumers are less likely to switch to another producer when the price of butter rises. There are relatively few domestically produced products (Kerry Group and Glanbia), so consumers are less likely to switch. There are not enough substitute producers of butter. Consumers can only adjust by either doing with less butter or using alternative products e.g. margarine.

[On export markets there are a greater number of substitute producers of butter. Consequently, if the price of Irish butter rises, consumers will more readily switch to another producer.]

QUESTION 2



The diagram shows the costs and revenues at different levels of output for a farm:

(a) Copy the diagram into your answer book, identifying the relevant curves.

Fixed costs curve (AB), total revenue curve (0C), and total cost curve (AD).

(b) Identify on your diagram and explain the following:

(i) **The range of output over which the farm is operating at a loss:**

In the above diagram the farm is making a loss between 0 and Q_1, where total cost exceeds total revenue, and for quantities above Q_3.

(ii) **The range of output over which the farm is creating a profit**:

In the above diagram the farm is making a profit between Q_1 and Q_3, where total revenue exceeds total costs.

(iii) **The level of output at which the profit is maximised/optimum level of output:**

Profit is maximised were the degree to which total revenue exceeds total costs is at a maximum (i.e. the gap between them is at its widest). This occurs between the points x and y, and corresponds to a quantity of Q_2.

(c) Distinguish between farm profit and family farm income:

Farm profit is defined as the value of output or total revenue **less all costs** including imputed or estimated costs of the owned factors, i.e. actual plus imputed costs (Labour, Land).

Family farm income measures the amount farmers earn with their own resources after all costs other than those of the owned resources are deducted from total revenue. It is a more meaningful term than profit as it does not involve the artificial valuation of the owned resources.

Total Output less Variable Costs (= Gross Margin) less Fixed Costs = Family farm income.

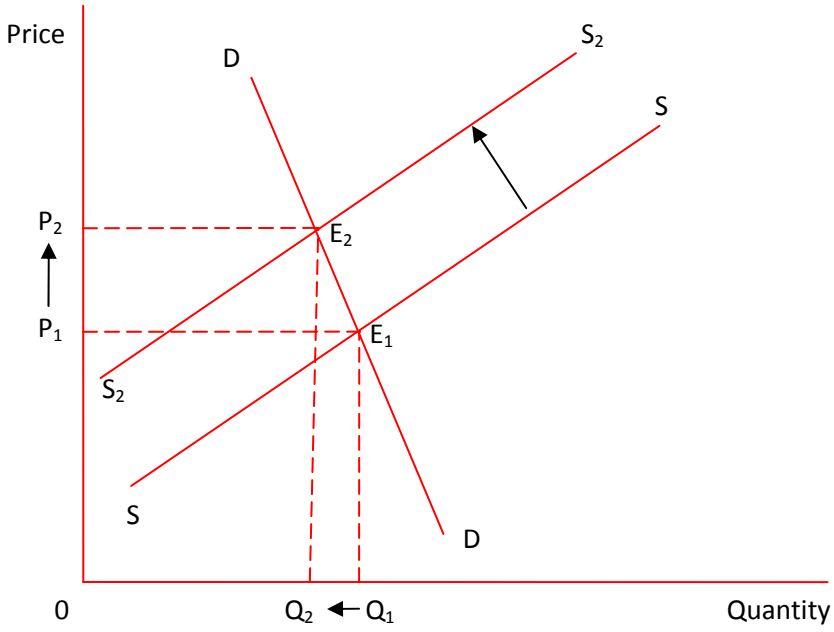
QUESTION 3

In a 2011 G-20 policy report on price volatility (i.e. fluctuations in prices) in the food and agricultural markets it stated that the period since 2006 has been one of extraordinary volatility".

The given diagram above shows the demand (DD) and supply (SS) curves prevailing in the world markets for agricultural products. Illustrate and discuss the role of the following in creating this volatility in prices:

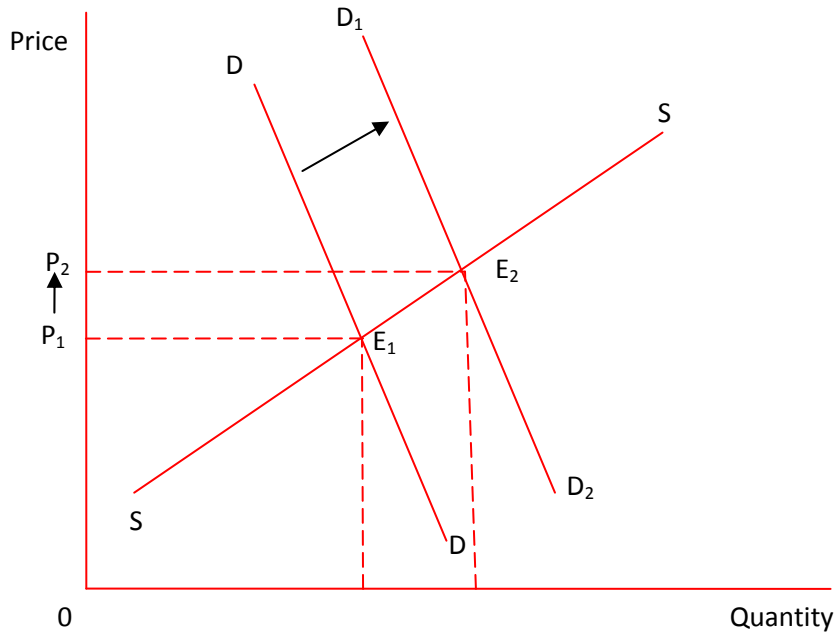
(Note: A separate diagram is required in each case)

(a) Increased frequency of droughts, floods and other weather-related events associated with global warming.



- Droughts, floods and other weather related events lead to **supply-side shocks** and can lead to reduced supply (shown by shift from SS to S_2S_2 on the diagram).
- This reduction in supply at every given price causes a **movement along the demand curve (E_1 to E_2), to the new point of equilibrium** (E_2), thereby resulting in an **increase in the equilibrium price** (P_1 to P_2).

(b) World population growth and changes in consumption patterns associated with the emerging economies.



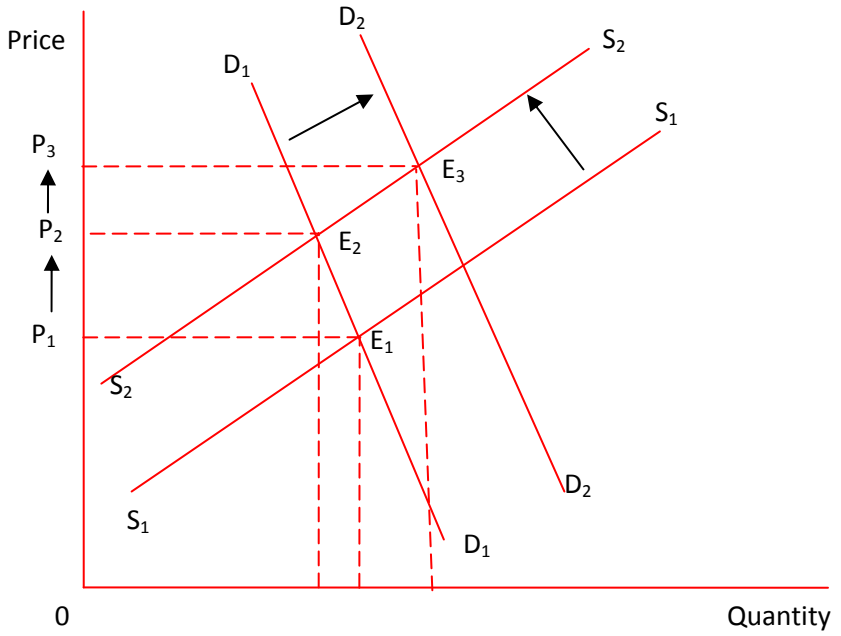
- Growth in the world population has led to an **increased number of consumers** of agricultural produce and therefore an increase in demand. Similarly, changes in consumer tastes as a result of economic development (*e.g.* the adoption of a more protein rich diet in Asia), has led to **increased demand for certain agricultural output**.

- This increased demand for agricultural output is shown by the shift in the demand curve from DD to D_2D_2.

- The resulting **movement along the supply curve** from equilibrium point E_1 to equilibrium point E_2 has resulted in **an increased equilibrium price** (P_1 to P_2).

- There is usually a time delay before supply can meet increased demand, leading to further price increases (demand pull inflation).

(c) Increased price of oil.



- Increased price of oil has affected both demand and supply for agricultural produce.
- Increased oil prices have driven up the cost of energy, thereby **increasing the input costs** of farmers. This has resulted in **reduced supply** (S_1S_1 to S_2S_2 above).
- This reduction in supply at every given price causes a **movement along the demand curve (E_1 to E_2), to the new point of equilibrium (E_2)**, thereby resulting in an **increase in the equilibrium price** (P_1 to P_2).
- The increased price of oil may lead to an **increase in the demand** for alternative energy sources, including biofuels, *e.g.* from willow and miscanthus. This leads to increased demand for certain agricultural outputs (D_1D_1 to D_2D_2 above).
- This shift in demand (D_1D_1 to D_2D_2) will cause a **movement along the supply curve** from E_2 to E_3, resulting in a new point of equilibrium (E_3) and will cause price to rise from P_2 to P_3.
- The decrease in supply and increase in demand will therefore lead to **upward pressure on prices (P_1 to P_3)**.

QUESTION 4
The Common Agricultural Policy (CAP) is one of the oldest EU policies.
In relation to CAP, discuss each of the following:

(a) The objectives of CAP and how they have evolved since the early 1990s.

The objectives of CAP have changed little since they were first set out in Article 39 of the Rome treaty. However, the weight given to each objective has altered significantly since the early 1990s. The objectives of CAP include

- promoting agricultural production
- ensuring a fair standard of living for agricultural population
- stabilising markets
- guaranteeing regular supplies
- ensuring a reasonable price for consumers.

Since the early 1990s, less emphasis has been placed on objectives concerned with levels of production. Movement to producer supports.

Under reforms in the early 1990s, greater emphasis was placed on the competitiveness of the agricultural sector and the adoption of an increased market orientation.

More recent reforms (agenda 2000 onwards) has seen greater emphasis being placed on objectives concerned with

- the environmental sustainability of agriculture
- food safety and quality
- the maintenance of rural communities.

(b) How the instruments used to achieve the objectives of CAP have changed since the early 1990s.

Prior to the early 1990s, the main policy instruments of the CAP system were intervention buying and export subsidies (product price support). This stimulated over-production and reliance on government incentives.

- Budgetary pressure and pressure from trading partners led to a reform of these instruments in the early 1990s.

- This marked a reduction in the use of product price support mechanisms and **greater use of producer supports**.

- Focus on supporting farmer incomes directly through the Single Farm Payment and other direct payment methods **not linked to production**.

- Environmental rural development criteria (cross compliance) required for payment.

- Other measure such as intervention prices are used as a safety net, i.e. are set at a low level in case of real crisis.

(c) The current challenges facing CAP as it moves forward.

- Moving forward there will be continuing focus on **sustainable farming**, particularly in relation to environmental issues.
- **Rural development** and protection of rural communities is also an issue of growing importance.
- An important element in both these objectives is the **provision of income support** for farmers. (Approximately 40% of EU Budget).
- Greening proposals/environmental payments.
- Method by which payments are made (Single Area Payment to replace the Single Farm Payment).
- Budgetary concerns in the wider economy,
- Political developments could affect EU Budget and CAP Budget outcome.

QUESTION 5

From the supplied quarterly cash flow budget for a farm for the year 2012,

(a) Discuss two uses farmers can make of cash flow budgeting.

- Cash Flow budgeting predicts the movement of cash into and out of the farm.
- It assists the farmer in decision making as it shows future cash inflows and outflows and their sources and timing.
- It identifies future cash shortages and helps the farmer to plan his borrowing requirements in time. Useful when applying for bank credit.
- Comparing the Cash Flow Budget with actual figures helps the farm to keep control of its finances.
- It helps the farmer to use future cash surpluses to best advantage.

(b) With the aid of the above cash flow budget, identify and discuss the recent trends in prices and costs in Irish agriculture. In your answer outline the reasons for these trends.

Input costs: The last year (2011) has seen a spiralling in input costs created by

- exchange rate movements (weak euro to sterling rate),
- rising grain costs (i.e. feed), due to alternative uses / biofuels
- adverse weather conditions (Russia and grain)
- rising oil and energy costs.

These increased costs have impacted on Irish farmers through increased prices for fertilizer (22%), feed (16%), energy (15%) and seed (2.5%).

The cash flow above shows a clear increase in fertiliser costs (€14,200 to €19,500), feedstuff (€12,000 to €19,400), energy costs (€10,000 to €14,000), Contractor costs (€4,000 to €5,900) and living costs (€16,000 to €24,300).

Farm output prices:

Due to

(a) increased world demand for food and energy,
(b) supply side shocks due to adverse weather
(c) political turmoil

there has been an increase in the output price for most Irish produce, including cereal (31%), milk (14%), sheep (7%), pigs (10%), poultry (9%) and beef (19%) prices.

This is reflected in the above cash flow by the increase in milk revenue (€48,500 to €55,000).

However, due to the continuing declines in employment in the construction and public sector, where many farmers and their spouses find off-farm income, there is also downward pressure on off-farm income.

As seen in the above cash flow, salaries have fallen this year (€10,500 to €1,700).

(c) With reference to the above cash flow, outline four ways a farmer can overcome problems associated with meeting financial obligations arising from farm operations and household maintenance.

- Increase productivity: through implementing more effective husbandry methods and breeding.
- Reduce costs: the farmer may be able to reduce his costs through reviewing his current insurance policies or contractor use, or working to reduce energy consumption.
- Restructure debt: through negotiation with his bank, the farmer may be able to renegotiate the terms of his debt (e.g. extend the loan period) and thereby reduce the repayment amount.
- Sell assets: the farmer may be able to raise some extra revenue through the sale of certain assets *e.g.* livestock, machinery.
- Reduce living standards: by reducing the cost of running the farm household (e.g. food costs), the farmer may be able to improve his cash flow position
- Earn extra off-farm income: by taking up extra work off-farm the farmer (or spouse) may be able to increase revenue
- Seek a rent review.

QUESTION 6

Agriculture accounts for a relatively small proportion of total output in the Irish economy. Nevertheless, the contribution to the economy made by agriculture should not be underestimated.

(a) Outline four contributions agriculture makes to the Irish economy

- The production of food and raw materials at a relatively low price for food processors and retailers. This has benefited consumers through the availability of relatively cheap food and the reduced need to dedicate a large proportion of disposable income to food
- Irish Agriculture is a major source of scientific and nutritional innovation. For example development of added-value products in the area of infant formula and whey-based protein nutritionals.
- Agricultural output has always been a major export for the Irish economy. More than 90% of Irish Beef and 85% of Dairy Products are exported. With increased agricultural productivity and a good reputation for high quality output, agriculture helps to maintain the Irish Balance of Payments and attract foreign currency.
- Direct effects: improved agricultural prices and farm revenue can directly benefit the Irish economy through increased demand for goods and services.
- Increased farmer income leading to improved economic growth.
- Increased output in agriculture will aid growth in related industries e.g. food processing. This leads to improved employment figures and aggregate demand.
- Agriculture makes a significant contribution to environmental protection.

(b) Discuss two arguments for and two arguments against free trade in agriculture

Arguments for free trade

- Can lead to the more efficient allocation of resources
- Larger, more efficient farmers would replace smaller farmers, thereby improving the performance of the sector
- Reduced levels of bureaucracy
- Prevents other countries imposing trade restrictions in retaliation for trade barriers
- Reduces risk through diversification
- World multiplier effect (countries taking advantage of comparative advantage)

Arguments against free-trade

- It does not protect infant industry or declining industries
- Externalities or importation of harmful goods
- Unstable prices and depressed incomes. May be of particular disadvantage for smaller farmers (survival of fittest)
- Food safety concerns
- Farmers lack sufficient mobility to adjust to market forces, therefore creating the possibility of other sectors of the economy exploiting farmers. Farmers are incapable of developing sufficient bargaining power.