

DUNMAN HIGH SCHOOL (SENIOR HIGH) ECONOMICS UNIT 2025 YEAR 5 H1



Theme 2: Markets 2.1 Price Mechanism and Its Applications

Section A

Check your concepts: Demand

1. Define demand.
2. State the Law of Demand and explain why the demand curve is downward sloping.
3. When a price increases, the law of demand suggests that the quantity demanded will increase / decrease* while the law of supply suggests that the quantity supplied will increase / decrease*. Therefore, the demand curve is upward / downward* sloping while the supply curve is upward / downward* sloping.

When the price of a good such as beef decreases, quantity demanded for it will _____. We say that there exists a/an direct / inverse* relationship between the price and quantity demanded.

Now, consider what happens to the demand when, at the same time of the reduction in price of beef, the government launches a healthy lifestyle campaign warning the public about the problems of excessive red meat intake. While the reduction in the price of beef will cause quantity demanded to _____, the healthy lifestyle campaign will cause the quantity demanded to _____ at each and every price.

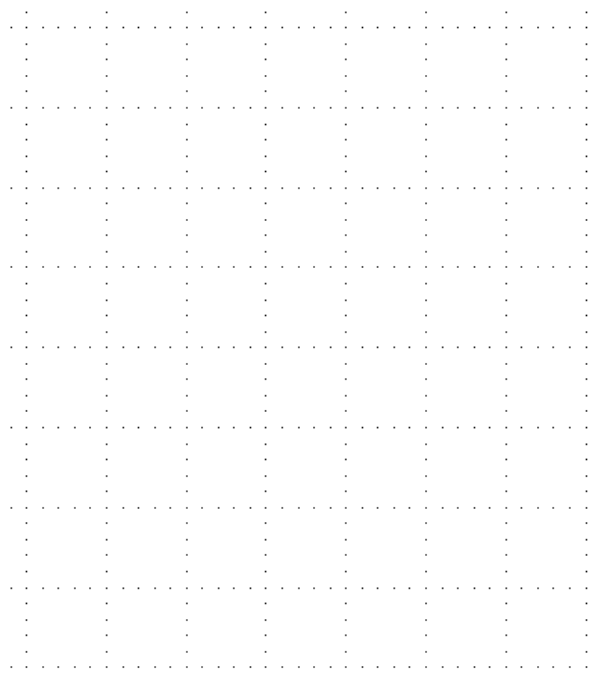
So when we say that the quantity demanded of a good varies _____ with its price, we are actually making the assumption of _____.

4. Below is a table showing the market demand for green beans. Study the data in the table, and plot the demand for green beans on a graph paper. Label the demand curve “D,” and answer the questions.

Demand for Green Beans in a year

Price (\$/kg)	\$0.10	\$0.15	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40
Quantity demanded ('000 kg)	350	300	250	200	150	100	50

Figure 1:



The data for demand curve “D” indicate that at a price of \$0.30 per kg, buyers would be willing to buy _____ thousand kg of green beans. Other things constant, if the price of green beans increased to \$0.40 per kg, buyers would be willing to buy _____ thousand kg. Such a change would be called a(n) increase / decrease* in demand / quantity demanded*. Other things constant, if the price of green beans decreased to \$0.20 per kg, buyers would be willing to buy _____ thousand kg. Such a change would be called a(n) increase / decrease* in demand / quantity demanded*.

Now let’s suppose that a dramatic increase in income tax rates reduces the disposable income of consumers. This change in the **ceteris paribus** conditions underlying the original demand for green beans will result in a decrease in demand, and we would have a new set of data such as that shown in the following table. Study the data in the new table, and plot the new demand curve (on the same axes in Figure 1). Label the new demand curve “D1” and then answer the questions below.

Decrease in the Demand for Green Beans

Price (\$/kg)	\$0.05	\$0.10	\$0.15	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40
Initial quantity demanded ('000 kg)	400	350	300	250	200	150	100	50
New quantity demanded ('000 kg)	300	250	200	150	100	50	-	-

Comparing the new demand curve (D1) with the old demand curve (D), we can say that a decrease in the demand for green beans results in a shift of the demand curve to the right / left*. Such a shift indicates that at each of the possible prices shown, buyers are now willing and able to buy a smaller / larger* quantity, and at each of the possible quantities shown.

6. Different types of demand relationship

Type of demand relationship	Given examples	Your examples
Competitive demand	Coffee and tea	
Joint demand	Cars and petrol	
Derived demand	Steel and cars	
Composite demand	Crude oil can be distilled and used to satisfy the demand for both electricity and synthetic fibre.	

7. An increase in demand occurs when

- The good is inferior and income _____
- The price of a substitute good _____
- The price of a complementary good _____
- Population _____
- Consumers tastes shift favour of / away from* the product
- Consumers expect a(n) _____ price in the future

WRITING EXERCISE

8. Read the extract before attempting the question

Rise of fast-fashion Shein, Temu roils global air cargo industry

The rapid rise of fast-fashion e-commerce retailers such as Shein and Temu is upending the global air cargo industry, as they increasingly vie for limited air-cargo space to woo consumers with rapid transit times.

Shein, Temu and TikTok Shop, which recently began online shopping in the US, send the majority of their products directly from factories in China to shoppers by air. And their growing popularity - Shein and Temu together send almost 600,000 packages to the United States every day, according to a June 2023 report by the US Congress - is a boost to air-freight from Asian hubs like Guangzhou and Hong Kong, making off-peak seasons almost disappear.

Source: CNA 21 Feb 2024

Using an appropriate diagram, explain how the above development affects the demand in the air cargo market. [4]

Check your concepts: Supply

9. Define supply.
10. State the Law of Supply and explain why the supply curve is upward sloping.
11. When the price of a good such as beef decreases, farmers will keep more / fewer* cows for milk rather than slaughter them for meat. We say that there exists a/an direct / inverse* relationship between the price of beef and quantity supplied of beef.

Now, consider what happens to the supply when, at the same time of the reduction in price of beef, the price of leather increases. While the reduction in the price of beef will cause quantity supplied of beef to _____, the increase in the price of leather will cause the quantity supplied of beef to _____ at each and every price.

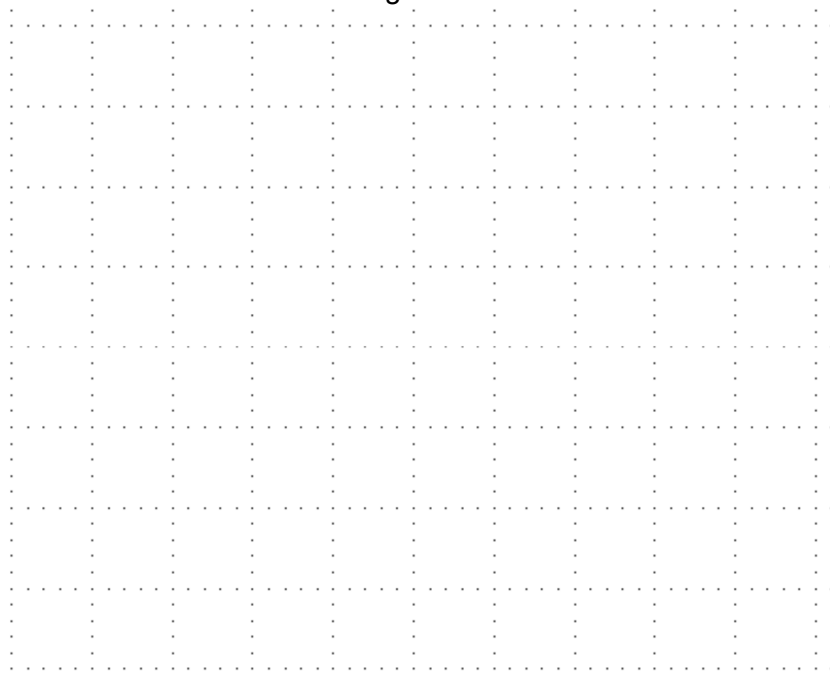
So when we say that the quantity supplied of a good varies _____ with its price, we are actually making the assumption of _____.

12. In this problem, and those that follow, we will assume that the long-run supply curve for green beans is “upward sloping.” Study the data in the table below, and plot the supply for green beans. Label the supply curve “S,” and answer the questions on the following pages.

Supply of Green Beans in a year

Price (\$/kg)	\$0.15	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40
Quantity supplied ('000 kg)	100	150	200	250	300	350

Figure 2:



The data for supply curve “S” indicates that at a price of \$0.25 per kg of green beans suppliers would be willing to offer _____ thousand kg of green beans. Other things constant, if the price of green beans increased to \$0.30 per kg, suppliers would be willing to offer _____ thousand kg of green beans. Such a change would be a(n) increase / decrease* in supply / quantity supplied*. Other things constant, if the price of green beans decreased to \$0.20 per kg, suppliers would be willing to offer _____ thousand kg of green beans. Such a change would be called a(n) increase / decrease* in supply / quantity supplied*.

Now let’s suppose that there is a dramatic increase in the price of several of the inputs used in growing green beans (e.g. fertilizer, seeds). This change in the **ceteris paribus** conditions underlying the original supply of green beans will result in a(n) increase / decrease* in marginal cost and a(n) increase / decrease* in supply by firms to capture the positive marginal profit / avoid the marginal loss*. We would have a new set of data such as that shown in the following table. Study the data in the new table, and plot this supply of green beans using the same axes in Figure 2. Label the new supply curve “S1” and answer the questions below.

Decrease in the Supply of Green Beans

Price (\$/kg)	\$0.15	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40
Initial quantity supplied ('000 kg)	100	150	200	250	300	350
New quantity supplied ('000 kg)	-	50	100	150	200	250

Comparing the new supply curve (S1) with the old supply curve (S), we can say that a decrease in the supply of green beans results in a shift of the supply curve to the right / left*. Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a smaller / larger* quantity.

Now, to take another example, let's suppose that there is a dramatic decrease in the price of several of the factor inputs used in growing green beans. This change in the **ceteris paribus** conditions underlying the original supply of green beans will result in a(n) increase / decrease* in marginal cost and a(n) increase / decrease* in supply by firms to capture the positive marginal profit / avoid the marginal loss*. We would have a new set of data such as that shown in the following table. Study the data in the new table, and plot this supply of green beans. Label the new supply curve "S2" and answer the questions below.

Increase in the Supply of Green Beans

Price (\$/kg)	\$0.10	\$0.15	\$0.20	\$0.25	\$0.30	\$0.35	\$0.40
Initial quantity supplied ('000 kg)	-	100	150	200	250	300	350
Quantity supplied ('000 kg)	150	200	250	300	350	400	450

Comparing the new supply curve (S2) with the original supply curve (S), we can say that an increase in the supply of green beans results in a shift of the supply curve to the right / left*. Such a shift indicates that at each of the possible prices shown, suppliers are now willing to offer a smaller / larger* quantity.

13. Different types of supply relationship

Type of demand relationship	Given examples	Your examples
Competitive supply	Corn as food and ethanol	
Joint supply	Cow hides and beef steak	

14. An increase in supply occurs when

- The cost of input _____
- A technological advance _____ the production cost
- The number of firms _____
- Producers expect a(n) _____ price in the future
- Product is taxed / subsidised*

WRITING EXERCISE

15. Read the extract before attempting the question

Fishermen in southwestern Vietnam are grappling with declining fish stocks and soaring operating costs, which have forced many of them to consider abandoning their boats and seeking alternative livelihoods as traditional fishing becomes unsustainable.

Source: Tuoi Tre News, 4 January 2025

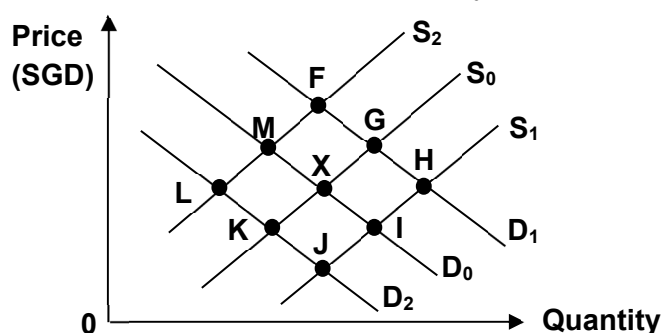
With the use of an appropriate diagram, explain the effect of the above developments on the supply in southwestern Vietnam seafood market. [4]

Check your concepts: Equilibrium

16. Consider the following demand and supply analysis of the world tea market (in billions of pounds).

Price per pound	Quantity Supplied	Quantity Demanded
\$0.38	1,500	525
\$0.37	1,000	600
\$0.36	700	700
\$0.35	600	900
\$0.34	550	1,200

- At price \$0.38, is there a shortage or surplus? Calculate the size of the shortage or surplus.
 - At price \$0.34, is there a shortage or surplus? Calculate the size of the shortage or surplus.
 - What is the equilibrium price and quantity?
17. The following figure shows the demand for and supply of hotel rooms in Singapore. The supply and demand curves are initially given by S_0 and D_0 . The market is in equilibrium at point X. Presented are some scenerios that have the effects of shifting the demand or (and) supply curves. For each of the scenerios, identify the new equilibrium point.



Market for hotel accommodations in Singapore

Scenario	New Equilibrium Point
A rise in the wages of hotel employees	
A fall in prices of hotel rooms in Kuala Lumpur	
The discovery of new construction technology	
Rising incomes in China and India	

18. The number of people who own robot vacuum cleaners has grown rapidly. Hence the demand for robot vacuum cleaners has grown rapidly as well. Yet, the price of robot vacuum cleaners has fallen. Explain why. [3]

WRITING EXERCISE

Relevant demand-supply diagrams should be included in your answers to Q19-21.

19. “A diamond is forever,” but perhaps not for the increasing number of consumers spurning the gemstone for lab-grown counterparts, gold and even other colored gemstones.

The demand for diamonds has declined as its allure fades in a key consumer market: China. Falling marriage rates as well as growing popularity for gold and lab-grown gems all drove down Chinese demand for diamonds.

Source: *CNBC*, Jun 5 2024

Explain the effect of the above trend on the equilibrium price and quantity of diamond. [5]

20. Japan's ageing farmers face extreme heat while maintaining rice crops, resulting in reduced harvests and summer rice shortages. Efforts to revive abandoned paddy fields underscore the challenges posed by heatstroke and an ageing agricultural workforce.

Source: *Associated Press*, 19 October 2024

How might an ageing population and adverse weather conditions affect the equilibrium price and quantity of rice? [5]

21. The price of certain strains of coffee beans has reached a two-year high. Weather disruptions, such as poor rainfall in major coffee-producing countries like Vietnam and Brazil, have led to widespread coffee plant deaths and reduced harvests. Simultaneously, there is a surge in international demand for coffee in emerging markets such as China, where a strong preference for coffee is rapidly developing.

Source: <https://www.brewmarkets.com>, 11 July 2024

Explain the effect of the above changes on the equilibrium price and quantity in the market for coffee beans. [6]

Check your concepts: Elasticities

22. Using the values of price elasticity of demand in the table below, determine

Type of good or service	Price Elasticity
Eggs	-0.1
Gasoline	-0.3
Shoes	-0.8
Foreign travel	-1.4
Alcoholic beverages	-1.8
Jewellery	-2.6

- which items have a price elastic demand and which items have a price inelastic demand,
 - the effect on the quantity demanded of shoes if price decreases by 20%, and
 - what would happen to the total revenue if the price of shoes were to increase.
23. Suppose that business travellers and holiday makers have the following demand for airline tickets from Singapore to Kuala Lumpur.

Price	Quantity Demanded (business travellers)	Quantity Demanded (holidaymakers)
\$150	2,100	1,000
200	2,000	800
250	1,900	600
300	1,800	400

As the price of tickets rises from \$200 to \$250, calculate the price elasticity of demand for

- business travellers, and
 - holidaymakers.
24. For each of the following pairs of goods, which good would you expect to have more price elastic demand and why?
- required textbooks or mystery novels
 - Beethoven recordings or classical music recordings in general
 - cooking oil during the next six months or cooking oil during the next five years
 - root beer or water
25. RCO Manufacturing is an electronics producer. Its main products are ultrabook computers, PCs and calculators. The current price of the ultrabook is \$500, the PC is \$800 and the calculator is \$40. This year RCO Manufacturing sold 10,000 ultrabooks, 20,000 PCs and 1 million calculators.

In an attempt to improve revenue, the managers have decided to increase all prices by 10%. Market research has suggested that the price elasticity of demand for each product is:

ultrabook: (-) 1.5	PC: (-) 2.5	calculator: (-) 0.6
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- Calculate the expected change in the quantity demanded of each product in view of the planned price changes.
- Would a 10% price reduction have been better for some or all of the products?

26. Suppose that the price of peanut butter decreases from \$4.3 to \$3.7. As a result, quantity supplied decreases from 260 to 180. Based on this information,
- A. The supply is price inelastic
 - B. The supply is price elastic
 - C. The supply is unit ()
27. Suppose the price elasticity of supply has been calculated for LaCroix sparkling water at 1.3 and the price increases by 15%. What would happen to the quantity supplied?
- A. It would increase by 8.66%.
 - B. It would increase by 11.5%
 - C. It would increase by 19.5% ()

WRITING EXERCISE

28. How might an increase in steel price be expected to impact consumer expenditure on cars? [3]
29. Meta-analysis of public transport demand shows that the coefficient of price elasticity of demand for the urban public transport has an average value of around -0.38 .
- a. Explain what a price elasticity of demand (PED) value of -0.38 for urban public transport means. [2]
 - b. Account for such a PED value. [2]
 - c. With the use of appropriate diagrams and relevant demand elasticity concepts, analyse the effect of an increase in urban public transport fares on the revenue of
 - (i) urban public transport operators, and [2]
 - (ii) ride-hailing operators. [4]
30. Read the extract before attempting the question

Gas Infrastructure Europe (GIE) data showed Britain has the smallest amount of gas held in reserve out of the 20 European countries listed. There are several reasons for the disparity. The UK has much less gas storage capacity than other European countries. Britain's storage facilities can hold enough gas for 12 average days or just over a week during winter, while Germany has enough for 89 days.

A spokesperson for UK Prime Minister Kier Starmer told reporters in London that speculation the country was about to experience an energy blackout was "not true."

"Britain obtains its gas from a diverse range of sources beyond that already in storage, meaning we are well placed to respond to demand this winter," a National Gas spokesman told news agency Reuters in an email.

Source: dw.com, 16 Jan 2025

- a. What does the GIE data suggest about the price elasticity of supply (PES) of gas in the UK compare to other European countries? [3]
- b. Explain the effect of diversification of gas supply sources on the PES of gas in the UK. [3]

Check your concepts: Microeconomic Policies I

Answer Questions 31-33 with reference to the following demand and supply table.

Unit price (\$)	1	2	3	4	5	6	7
Quantity demanded (units)	100	90	80	70	60	50	40
Quantity supplied (units)	40	50	60	70	80	90	100

31. Suppose the government carries out an effective price ceiling with the maximum price per unit set at \$3, which of the following situations is most likely to occur?

- A. There is an excess supply of 20 units.
- B. There is an excess demand of 20 units.
- C. Quantity transacted increases by 10 units.
- D. The government has a surplus. ()

32. If the government sets the minimum price at \$2,

- A. there will be an excess supply of 40 units.
- B. the consumer of the product will gain the largest benefit.
- C. shortage of product will occur.
- D. the equilibrium price of the product will still be at \$4. ()

33. If the government sets an import quota at 60 units,

- A. the per unit market price is \$5.
- B. the per unit market price is \$3.
- C. the quantity transacted is 80 units.
- D. the total market value of the product is \$280. ()

34. Using demand-supply diagrams, identify the areas that represent

- government spending / revenue,
 - consumer expenditure
 - producer revenue
- a. arising from an indirect subsidy
 - i. government spending,
 - ii. consumer expenditure
 - iii. producer revenue (inclusive of subsidies received)
 - b. arising from an indirect tax
 - i. government revenue,
 - ii. consumer expenditure,
 - iii. producer revenue (net of tax payment)
 - c. arising from a price ceiling
 - i. consumer expenditure,
 - ii. producer revenue.
 - d. arising from a price floor (with government buying up the surplus)
 - i. government spending,
 - ii. consumer expenditure
 - iii. producer revenue (inclusive of payment received from the gov)
 - e. arising from a quota
 - i. consumer expenditure,
 - ii. producer revenue.

Section B

Question 1 (adapted from RI Prelim 2016)

The Market for Onions and Other Agricultural Products

Extract 1: Environmental Impacts Associated with Major Food Crops

In countries like India, agricultural intensification (involving the adoption of modern irrigation, fertilizers, improved seeds, and pesticides) has contributed to dramatic gains in food yields since the 1960s.

However, increasing evidence suggests that intensive farming systems, if not properly managed, can cause serious environmental harm. Unintended consequences in water use, soil degradation, and chemical runoff have had serious environmental impacts beyond the areas cultivated

The environmental consequences were not caused by the technology per se but rather, the policy environment that promoted injudicious and overuse of inputs. Where the policy incentives were corrected, farmers quickly changed behaviour and adopted more sustainable practices. For example, the removal of pesticide subsidies in Indonesia in the early 1990s led to a dramatic drop in insecticide use.

Sources: (1) <http://link.springer.com/article/10.1007/s12571-015-0478>,
(2) Prabhu L. Pingali (2012) Green Revolution: Impacts, limits, and the path ahead, Proceedings of the National Academy of Sciences of the United States of America.

Table 1: Average Vegetable Prices (rupees per kg) – 30 cities

	Mar 2015	Mar 2014
Onion	24	16
Peas	35	23
Potato	13	13

Source: NHB; till 18 March 2015. Figures rounded off

Extract 2: Onionomics: Peeling away the layers of India's food economy

The onion is an essential part of the diets of millions of Indians, rich and poor. Few Indian kitchens can do without the pungent bulb. It's pureed, sautéed and garnished in meals, eaten raw as a salad, used as a dip, fried as fritters and crisps.

"The demand for onions is completely inelastic. You cannot substitute it with any other vegetable," says farm economist Ashok Gulati, who also heads India's Commission for Agricultural Costs and Prices.

A glut in supply can bring down prices, hitting tens of thousands of farmers. Conversely, a shortage can send prices spiralling and trigger angry protests.

"The onion is a very volatile commodity," says Mr Jain, an onion trader. "Nobody knows when the prices will move up or go down. We can't hoard it for too long because it is perishable and it is bought and sold in the free market."

The onion trade demonstrates how the farm economy depends heavily on the vagaries of weather. Unseasonal rain can damage crops, choke supply lines and drive up prices.

Source: BBC News 12 February 2014

Extract 3: Government Expects Onion Prices to Moderate Soon

Unseasonal weather and hoarding have in the past months led to dramatic price rises. A doubling in retail prices across major cities is especially troubling for staples such as onions, an ingredient that is present in just about every Indian meal as it wreaks havoc on households' budgets.

In response, the government introduced measures such as banning the exports of locally produced onions and slashing tariffs or taxes on imported onions. The government also tried importing cheaper onions from Pakistan, Iran, Afghanistan and China.

Economist DK Joshi says that short-term measures such as limiting price rises or exports will not solve the real problem. "Inefficiencies in the system [supply chain] cause prices to shoot up," he says, adding that "agricultural produce has not kept up with the demand". Overall consumption is higher due to population increases, and as some people enjoy higher incomes, they demand more food. There is a need for a training programme for farmers on storage of cash crops and grants to farmers to invest in storage infrastructure and better seeds.

Source: Adapted from various sources

Extract 4: Cabbage prices go up as onions become unaffordable

As retail onion prices cross the half century mark, cabbage has replaced onion wherever possible, especially in the hotel and catering industry.

"Whenever the onion prices increase, cabbage prices too go up," said farmer Ajay Belhekar. However, cabbage has not replaced onions everywhere in the country.

"People have not been eating cabbage due to the rumours about its ill effect on health. It is now mostly used by hotel industry, the roadside eateries and poor people who eat cabbage because it is cheap," said Sanjay Bhagat, general secretary of the Simla Gobhi Association.

Source: The Economic Times (Aug19, 2015)

Questions

- (a) On a production possibilities curve depicting agricultural goods and manufactured goods,
- (i) explain the benefits “agricultural intensification” (Extract 1) has had on the PPC of a country such as India. [3]
 - (ii) explain the effect of the above change on the opportunity cost of producing an additional unit of manufactured goods. [4]
- (b) By considering the rational decision making of the Indonesian farmers, explain their response to the removal of pesticide subsidies (Extract 1). [4]
- (c) Referring to Table 1, compare the price changes of onions, peas and potatoes. [2]
- (d) (i) Explain what the statement: “the demand for onions is completely inelastic” (Extract 2) means. [2]
- (ii) Using evidence from the data, comment on the validity of the above statement. [3]
- (e) Referring to Extract 3,
- (i) with the help of a demand and supply diagram, account for the “dramatic price rises” of onions in recent months. [5]
 - (ii) using elasticity concept, explain how the above price increase wreaked “havoc on households’ budgets”. [4]
- (f) Referring to Extract 4,
- i) identify the relationship between onions and cabbages. [1]
 - ii) state the relationship between the price of the two vegetables. [1]
 - iii) with the help of a demand and supply diagram, explain the effect of an increase in onion price on the consumer expenditure on cabbages. [3]
- (g) Discuss the effectiveness of the following policies in stabilising short-term price fluctuations of agricultural products:
- export bans in periods of sharp increases in domestic prices, or
 - investment in storage infrastructure. [8]

Question 2 (adapted GCE A-level Nov 2009 H2 Economics)
The Impending Global Food Crisis

Table 2: Indices of selected primary commodity prices

Year	All Primary Commodities	Food	Petroleum
1995	100.0	100.0	100.0
2000	116.0	78.9	164.1
2001	105.6	79.1	141.4
2002	105.9	81.8	145.0
2003	119.7	86.0	167.9
2004	151.5	98.3	219.5
2005	195.7	97.9	310.1
2006	238.6	107.6	373.6
2007	273.2	126.5	427.6

Source: Various

Extract 5: Global food crisis looms as climate change and fuel shortages bite

Empty shelves in Venezuela. Food riots in West Bengal and Mexico. Warnings of hunger in Jamaica, Nepal, the Philippines and sub-Saharan Africa. Soaring prices for basic foods are beginning to lead to political instability, with governments being forced to step in to control the price of bread, maize, rice and dairy products.

According to the United Nations (UN) Food and Agricultural Organisation (FAO), record world prices for most staple foods have led to 18% food price inflation in China, 13% in Indonesia, and 10% or more in Russia and India. Wheat has doubled in price, maize is nearly 50% and rice 20% more expensive than a year ago, says the UN. Next week the FAO is expected to say that global food stocks are at their lowest in 25 years and that food prices will remain high for years.

Last week the Kremlin forced Russian companies to freeze the price of milk, bread and other foods. India, Yemen, Mexico and several other countries have had, or been close to, food riots in the last year, something not seen in decades of low global food prices. Meanwhile there are shortages of beef, chicken and milk in Venezuela and other countries as governments attempt to control food prices.

'If you combine the increase in food prices and the increase in oil prices then you have the elements of a very serious crisis in the future,' said the head of the FAO.

'The food price rises are a result of record oil prices, US farmers switching out of cereals to grow bio-fuel crops, extreme weather and increasing demand from India and China. World cereal stocks now stand at only 57 days, making global food supplies vulnerable to an international crisis, drought or flood which would cause prices to rise very quickly,' he warned.

The head of the Washington-based Worldwatch Institute said 'There is competition for grain between bio-fuel producers and food producers. The world's 800 million motorists want to maintain their mobility while its 2 billion poorest people are simply trying to survive. This is emerging as a major issue.' Last year, US farmers affected the world market for cereals by growing 14 million tonnes of maize, or 20% of the whole crop, for bio-fuel production. This took millions of hectares of land out of food production and nearly doubled the price of maize.

President Bush this year called for steep rises in bio-fuel production as part of plans to reduce petrol consumption by 20% by 2017. Maize is staple food in many countries which import from the US, including Japan, Egypt and Mexico. US exports are 70% of the world total, and are used widely for animal feed. The shortages have disrupted livestock and poultry industries worldwide. The outlook is expected to worsen as others prepare to switch to highly profitable bio-fuels. Brazil intends to grow 120 million hectares for bio-fuels and Africa as much as 400 million hectares in the next few years.

The food crisis is being made worse by growing populations and extreme weather, according to a number of recent reports. This week the UN Environment Programme said the planet's water, land, air, plants, animals and fish stocks were in 'continuous decline'. According to the UN's World Food Programme (WFP) 57 countries, including 29 in Africa, 19 in Asia and 9 in Latin America, have been hit by catastrophic floods. Harvests have been affected by drought and heatwaves in South Asia, Europe, Australia, China, Sudan, Mozambique and Uruguay.

Source: *The Guardian*, 3 November 2007

Extract 6: Food or fuel?

Vulnerable regions of the world face the risk of famine over the next three years as rising energy costs spill over into a food crisis.

Global oil output has been stagnant for four years, failing to keep up with rampant demand from Asia and the Middle East. China's oil imports, for example, rose 14% last year. Bio-fuels from grain, oil seed and sugar are satisfying the demand to some extent, but this is drawing away food supplies at a time when the world is adding more than 70 million extra mouths to feed a year.

'China is terrified of the current situation. It has serious shortages of food,' said a commodity trader. China still has painful memories of starvation in the 1960s. We are facing an entirely new situation because now changes in the prices of energy and food have 'converged' as resources can increasingly be switched from one use to another. Corn can be used for bio-fuel in cars and power plants, as well as in baking tortillas. Natural gas can be made into fertiliser for food output.

Land use for bio-fuels has shot up from 12 million to more than 80 million hectares worldwide over six years. Bio-fuel provides 3% of global energy needs, which will rise to an estimated 10.6% by 2030. The European Union (EU) has set itself only until 2010 to reach a 10% bio-fuel target. In a market without government intervention, sugar cane would be the only viable crop for making bio-fuel but government subsidies make other crops viable too. These include corn, wheat, rapeseed and soybean.

Source: *Daily Telegraph*, 9 February 2008

Questions

- (a) Referring to Table 2, compare the change in food prices between 2000 and 2007 with the change in petroleum prices over the same period. [2]
- (b) With the help of a demand and supply diagram explain the effect of the introduction of food price controls as described in Extract 5. [2]
- (c) Explain why an increase of 70 million mouths to feed each year may cause food prices to rise, showing how low stocks of food would affect the extent of this rise in the short run. [4]
- (d) Extract 6 describes the use of subsidies in the market for bio-fuels. With the use of diagrams, explain the way in which subsidies affect the allocation of resources between bio-fuels and food. [4]
- (e) As a consultant economist, what options would you present to the world's government as possible responses to the threat of food shortages, and what would you recommend? Justify your answer. [10]