

Answer **all** questions.

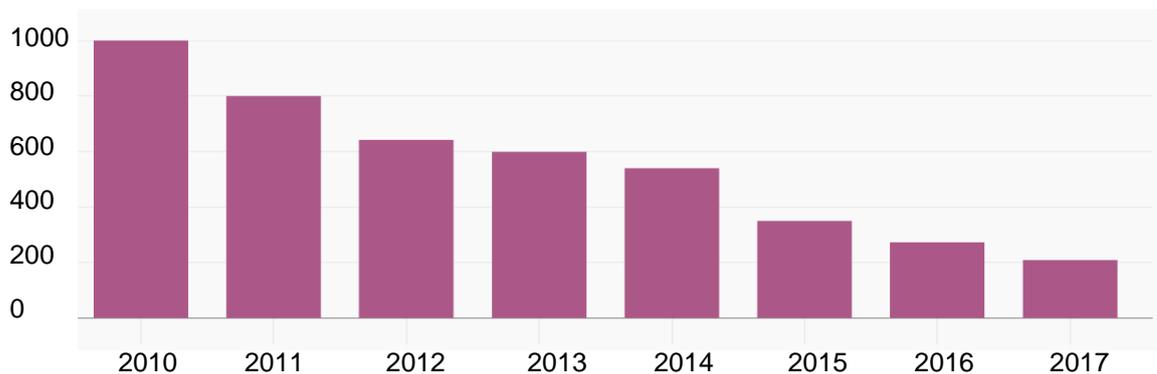
Question 1: The Rise of Electric Vehicles

Figure 1: Global price of cobalt (US\$ per million tonnes)



Source: *Trading Economics*, accessed 5 July 2018

Figure 2: Global price of lithium-ion battery (US\$/kilowatt-hour)



Source: *Bloomberg New Energy Finance*, accessed 5 July 2018

Extract 1: Technology is fuelling the use of cobalt

Cobalt is a hard, shiny and greyish metal which has many strategic and irreplaceable industrial uses as a result of its unique properties. Currently used in numerous industrial chemical processes, close to half of the world's cobalt supplied today is used in lithium-ion batteries, putting it at the heart of the drive for alternative and renewable energy systems. There has not been a good substitute to make lithium-ion batteries without the mineral. However, more than half of the world's reserves and production of the metal are in one country, the Democratic Republic of Congo. This has led to a fear of shortage.

Mining companies are planning new cobalt operations that may balance supply and demand in the near term, but if electric vehicles continue to gain market share, any stabilisation may be short-lived. Each new electric vehicle, which runs on lithium-ion battery, uses about 10 kg of

cobalt. The use of cobalt is expected to accelerate further as electric vehicles will be close to reaching cost parity with internal combustion engine vehicles.

Sources: *www.dartoncommodities.co.uk/* (accessed on 21 July 2018); *CNBC*, 16 April 2018

Extract 2: Diesel-powered cars are on their way out

Diesel-powered cars appeal to European drivers for their fuel efficiency and power. Carmakers like them because they emit less carbon dioxide than similar petrol engines do, making it easier to comply with stiff regulations. However, in recent years, governments have shifted gear. The advent of electric cars has knocked diesel off its perch as the fuel with the smallest carbon footprint. Diesel also releases greater quantities of nasty gases other than carbon, such as nitrogen oxides, than petrol does. Many cities in Europe, and farther afield, want to eliminate diesel cars from their roads as early as 2025. Governments hope that the void left by diesel will be filled by zero-emission battery-powered models. But mass adoption of such vehicles, which for now are expensive and have limited ranges in travel distance, still appears a way off.

Source: *The Economist*, 13 February 2018

Extract 3: Charging ahead, China's dirty race for clean vehicles

After a decade of halting progress, electric cars are zooming ahead in China. Last year the number of registrations of new electric vehicles (EVs) in the country overtook that in America, making it the world's biggest and fastest growing market. The category includes electric-only cars as well as plug-in hybrids that can also run on petrol. Analysts expect the market to grow by nearly 50% a year for the rest of this decade.

The government has had a big role in the marked expansion of EVs in China. It doles out generous subsidies to local makers, to parts suppliers and to those who buy the final products. Last year alone, China shovelled over 90 billion yuan in subsidies into the industry, which it calls "strategic". This has led to queues of EVs on the streets, mostly of poor design and quality. China has yet to produce an EV manufacturer that can compete at the level of America's Tesla Motors.

The Chinese government is also encouraging other Chinese firms, including the country's tech giants, to innovate in the field. Tencent, a gaming and social media firm, is developing internet-connected EVs with Taiwan's Foxconn. Alibaba, an e-commerce firm, is providing data and cloud-computing services to Kandi Technologies, a local EV-maker that is popularising the sharing of the vehicles.

Source: *The Economist*, 28 July 2016

Extract 4: Autonomous vehicles are just around the corner

Every day around 10 million people take an Uber ride. The company has made ride-hailing commonplace in more than 600 cities in 82 countries and Uber is experimenting the use of autonomous vehicles— cars that can drive by themselves. Autonomous vehicles have made rapid progress in recent years and can now be seen on the roads in several American cities, easily identified by the clusters of sensors on their roofs.

The combination of the use of autonomous vehicles and ride-hailing, together with a switch to electric vehicles, seems likely to undermine the logic of car ownership for many people. Ride-hailing services in the rich world currently cost around US\$2.50 per mile, compared with about US\$1.20 per mile to own and operate a private car. But the driver cost accounts for about 60% of the cost of ride-hailing. UBS, an investment bank, reckons that automation, competition and electrification (which makes cars more expensive to buy but much cheaper to run) will cut the cost of ride-hailing by 70%, to about US\$0.70 per mile. UBS predicts that autonomous taxis will take off rapidly after 2025, with 80% of people using them in cities, where available, by 2035.

Source: *The Economist*, 1 March 2018

Questions

- (a) Using examples from Extract 1, distinguish between complements in demand and derived demand. [2]
- (b) With reference to Extract 1, and using a supply and demand diagram, account for the sharp increase in the global price of cobalt between 2016 and 2018. [4]
- (c) Explain a factor that could be responsible for the trend in the global price of lithium-ion battery shown in Figure 2. [3]
- (d) Consider whether an expansion in the supply of cobalt by the mining companies will increase their total revenue. [5]
- (e) Explain whether electric vehicle is a public good. [4]
- (f) Explain the market failure resulting from the usage of diesel-powered cars. [6]
- (g) With reference to Extract 3, evaluate the policies adopted by the Chinese government to increase the production of electric vehicles in China. [9]
- (h) Discuss whether increasing production of electric vehicles, together with driverless and ride-hailing transportation, will mean that governments do not need to intervene in the public transport market of buses and trains. [12]

[Total: 45]

Question 2: UK's Growth and Economic Dynamism

Table 1: Economic indicators of the UK economy (Annual % change)

	2015	2016
Real GDP growth rate	2.3	1.8
Inflation rate	0.4	1.0
Unemployment rate	5.4	4.9

Table 2: Changes in UK's GDP composition by industry (%)

	Manufacturing Industries	Services-producing Industries ¹	Other Industries
2006	22.1	77.3	0.6
2016	19.2	80.2	0.6

¹Wholesale & Retail Trade, Transportation & Storage, Accommodation & Food Services, Business, Finance & Insurance, Information & Communications and other Services

Sources: *Various*

Extract 5: Better than expected performance for the UK economy since the Brexit vote

Following UK's vote to leave the European Union (EU) in June 2016, most economists believed that a recession was imminent. But there has been no recession. What went right?

Firstly, economists' worries that heightened uncertainty would prompt households to rein in their spending and businesses to put investment plans on hold were unfounded. Meanwhile, Britain remains an attractive place for foreign investors, in part because of its trusted legal system and low rate of corporation tax. The global economy has also helped. The Brexit vote coincided with the beginning of the first worldwide economic upswing in years.

The question is whether this unexpectedly good performance can continue. As UK's departure from the EU nears, businesses may start to get more jittery. If investment spending is cut, then consumers will eventually start to feel the pinch. And Brexit itself, which is likely to leave Britain with severely reduced access to its largest export market, will have profoundly negative long-term economic consequences.

Source: *The Economist*, 15 January 2018

Extract 6: Issues facing UK beyond Brexit

Britain has deep structural problems. The economy has been too dependent on debt-driven consumer spending and suffered from decades of underinvestment in public infrastructure. The availability of cheap workers has also meant companies have less incentive to splash out on expensive but efficiency-enhancing machines.

But one point is worth making. Today, the makeup of growth is changing all thanks to the pound's fall in the foreign exchange market which is helping to rebalance the economy away from an excessive reliance on consumer spending, even though the boost to exports and

national income would be bigger had it not been for the insignificant growth in industrial capacity over the past four decades.

Source: *The Guardian*, 15 March 2018

Extract 7: The changing structure of the UK economy

Since 2011, the UK's manufacturing sector has suffered a fresh era of decline as it relies on an expansion of low value-added assembly line roles in industries. This is far from their dream of being the source of new high value-added jobs in research and development. Output has barely risen in the past five years despite a 5% increase in the number of jobs created, revealing that the driving force of year-on-year productivity improvements have eluded the sector.

This is in contrast with the UK's services industries where employment and output is growing faster, especially in face-to-face services such as personal care. These service jobs are more difficult to automate than manufacturing or information services, which gives more room for these industries to come up with innovation to create personalised and niched services. But this may not always be possible, due to limited financial resources by the smaller companies.

All these reflected the changing structure of the UK economy, where the manufacturing share of its gross domestic product (GDP) has been on a downtrend, while the services sector has grown at a higher rate. With productivity growth in the services sector rising at a more moderate pace than in manufacturing, overall labour productivity growth has likewise been affected. As the size of services-producing sector increases, the ability of the UK economy to boost and sustain productivity growth rates is going to be very important.

Source: *The Guardian*, 21 October 2016

Extract 8: UK can still achieve economic dynamism

When a country is dynamic, it is more resilient to shocks, can grow more rapidly without generating inflationary pressure or creating risks to financial stability and can also be associated with more effective competition.

UK has a falling total fertility rate and an ageing population. However, many economists suggest that demographics is not destiny. While vibrant cities do attract people and add to the labour force, the main source of growth and dynamism is not headcount but productivity growth. This goes to show that the UK can still achieve economic dynamism in the face of demographic changes but how exactly can this be achieved?

Often, governments tend to champion specific sectors such as manufacturing or industries such as green technology. True dynamism flows from continuous innovation, experimentation, adaptation, and change, all of which raise productivity over time. These productivity gains, in turn, lift incomes and drive greater consumption. This fuels more innovation and a dynamic economy thus expands in a healthy, sustainable way.

According to the Grant Thornton's Global Dynamism Index released in 2015, the UK ranks 27 out of 60 economies for its overall growth potential contributed by a combination of factors, including political and economic stability, low level of legal and regulatory risk, intellectual

property filing rates and innovative businesses drawing from a global talent pool. For the UK to maintain and improve its competitiveness, it should do more to encourage investments in infrastructure, technology, productivity and other dynamic indicators which ultimately power the economy and instil confidence in its long-term growth prospects.

Sources: *Various*

Questions:

- (a) What conclusion would you draw from Table 1 about the overall economic performance of the UK economy in 2016 compared to 2015? [4]
- (b) Using an AD/AS diagram, explain two reasons why the UK economy was expected to slip into recession after deciding to leave the European Union. [5]
- (c) With reference to Extract 6,
- (i) Explain how the fall in the value of pound might affect general price level in the UK. [3]
- (ii) Explain what it means by “the boost to exports and national income would be bigger had it not been for the insignificant growth in industrial capacity over the past four decades”. [2]
- (d) Using Extract 7, discuss whether all countries should follow the UK economy by expanding their services industries to achieve higher economic growth. [9]
- (e) In light of the case materials provided, discuss the policies that the UK government could adopt to maintain a low rate of unemployment. [10]
- (f) Extract 8 suggests that the UK can still achieve economic dynamism despite her demographic changes.
- Discuss the view that ageing population is not an obstacle to the UK economy in achieving economic dynamism. [12]

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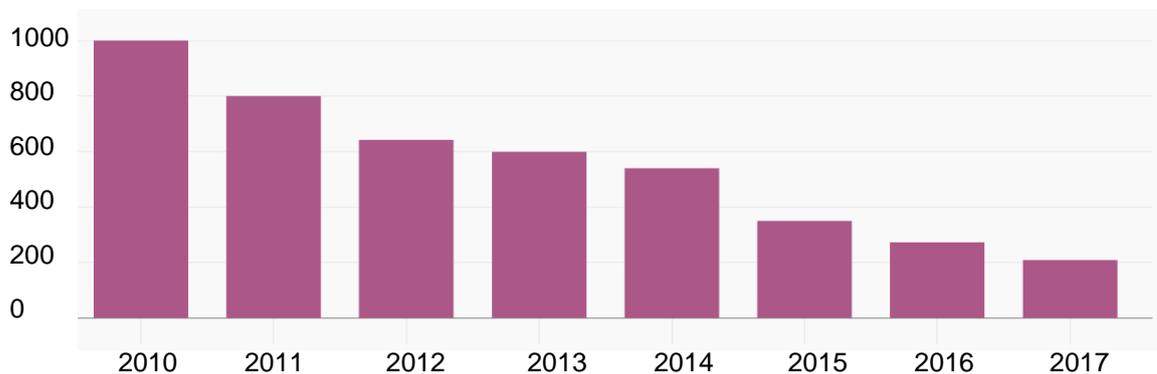
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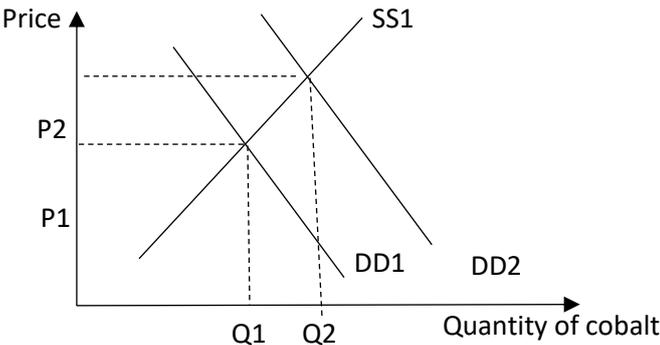
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Suggested Answers

(a)	Using examples from extract 1, distinguish between complements in demand and derived demand.	[2]
<p>Skills:</p> <ul style="list-style-type: none"> ✓ Identify examples from Extract 1 that shows complement in demand and derived demand. ✓ Explain the difference between complement in demand and derived demand. <ul style="list-style-type: none"> • Lithium-ion batteries and electric vehicles are complements in demand as lithium-ion battery is needed to run (used in conjunction/together) the electric vehicles • On the other hand, the demand for cobalt is derived from the demand for lithium-ion battery as cobalt is needed to manufacture (used as an input to produce) lithium-ion battery. <p>Mark scheme:</p> <ul style="list-style-type: none"> • 1 mark for explaining that lithium-ion battery and electric vehicle are complements in demand. • 1 mark for explaining that demand for cobalt is derived from the demand of lithium-ion battery. 		
(b)	With reference to Extract 1, and using a supply and demand diagram, account for the sharp increase in the global price of cobalt between 2016 and 2018.	[4]
<p>Skills:</p> <ul style="list-style-type: none"> ✓ Identify a factor from extract 1 that has resulted in the increase in global price of cobalt. ✓ Explain that the increase in price is caused by an increase in demand and the magnitude of increase is influenced by the price elasticity of supply. <ul style="list-style-type: none"> • The increase in price of cobalt is due to an increase in demand as there has been an increase in the use of electric vehicles which requires cobalt in the manufacturing of lithium-ion batteries to power electric vehicles. • This resulted in a rightward shift of the demand curve → shortage of cobalt at the original equilibrium price → upward pressure on price → price increase. • The sharp increase in price is due to the supply of cobalt being price inelastic as it takes time to mine the cobalt and most of the world's reserves and production of cobalt are in one country, the Democratic Republic of Congo (extract 1) → producers cannot respond to the price increase quickly and thus will increase price sharply to eliminate the shortage. <div style="text-align: center;">  </div>		

Mark scheme:

- 1 mark for identifying demand for cobalt has increased due to increase in demand for electric vehicles and lithium-ion batteries. (use of case evidence)
- 1 mark for explaining how the increase in demand of cobalt leads to an increase in its price.
- 1 mark for explaining that the sharp increase in price is due to supply being price inelastic
- 1 mark for correct diagram.

(c) Explain a factor that could be responsible for the trend in the global price of lithium-ion battery shown in Figure 2.

[3]

Skills:

- ✓ Identify the trend in the global price of lithium-ion battery in figure 2.
- ✓ Explain the price change using demand and supply concepts.

- The global price of lithium-ion battery has been **decreasing** as shown in figure 2.
- Since the demand for electric vehicles has been increasing, which will increase the demand for lithium-ion battery and hence its price, **the fall in global price of lithium-ion battery can be attributed to a larger increase in supply.** (increase in SS > increase in DD).
- The increase in supply could be caused by lowering cost of production due to technology improvement, scale expansion or increase in number of lithium-ion battery manufacturers.

Mark scheme:

- 1 mark for identifying that global price of lithium-ion battery is decreasing.
- 1 mark for explaining that the fall in price is due to an increase in supply.
- 1 mark for explaining a possible reason for the increase in supply.

(d) Consider whether an expansion in the supply of cobalt by the mining companies will increase their total revenue.

[5]

Skills:

- ✓ Explaining the impact on an increase in supply on total revenue
- ✓ Explaining how the impact on total revenue is dependent on the price elasticity of demand and the strength of demand as well.

- An expansion in the supply of cobalt by the mining companies will shift the supply curve to the right, resulting in a surplus and downward pressure on price, assuming demand is constant → **equilibrium price will fall and equilibrium quantity will increase.**
- The impact on total revenue is **dependent on the magnitude of change in price and quantity** since total revenue is given by price multiplied with quantity. This can be determined using the concept of **price elasticity of demand.**
- The **demand for cobalt is price inelastic** as there is a lack of strong substitute (extract 1) → the decrease in price will lead to a less than proportionate increase in quantity demanded → **total revenue will fall.**
- However, the **demand for cobalt is expected to increase** as demand for electric vehicle increases (extract 1) due to changing taste and preference. An increase in demand will push equilibrium quantity and price to rise, leading to an **increase in total revenue.**

- Therefore, whether the expansion in the supply of cobalt will increase the total revenue of mining companies depends on the extent of the increase in demand for cobalt in the future and the price elasticity of demand for cobalt as demand may become price elastic if a stronger substitute could be found.

Mark scheme:

- **1 mark for explaining the impact of increase in supply on equilibrium price and quantity of cobalt.**
- **2 marks for explaining how total revenue may decrease using the concept of price elasticity of demand.**
- **2 marks for explaining how total revenue may increase due to an expected increase in demand for cobalt or change in price elasticity of demand of cobalt in the future.**

(e) Explain whether electric vehicle is a public good.

[4]

Skills:

✓ *Explain the characteristics of a public good and justify whether electric vehicle has those characteristics.*

- A public good will display the characteristics of **non-rivalry in consumption and non-excludability**.
- Non-excludability: Once the good is provided, it is difficult or impossible to exclude non-payers from consuming the good.
- **Application to electric vehicle:** However, the usage of electric vehicle is excludable → A non-paying individual is easily denied the usage of the electric vehicle entry if he/she has not made the necessary payment.
- Non-rivalrous in consumption: The consumption of the good for an additional user will not diminish the quantity or satisfaction of existing users consuming the good.
- **Application to electric vehicle:** However, the consumption of electric vehicle is rivalrous → there is a maximum seating capacity in an electric vehicle.
- Thus, electric vehicle **does not display BOTH characteristics of a public good** and hence it is a private good.

Mark scheme:

- **2 marks for explaining the characteristics of a public good (non-rivalrous and non-excludability in consumption).**
- **2 marks for applying the concepts of non-rivalrous and non-excludability on electric vehicles**

(f) Explain the market failure resulting from the usage of diesel-powered cars.

[6]

Skills:

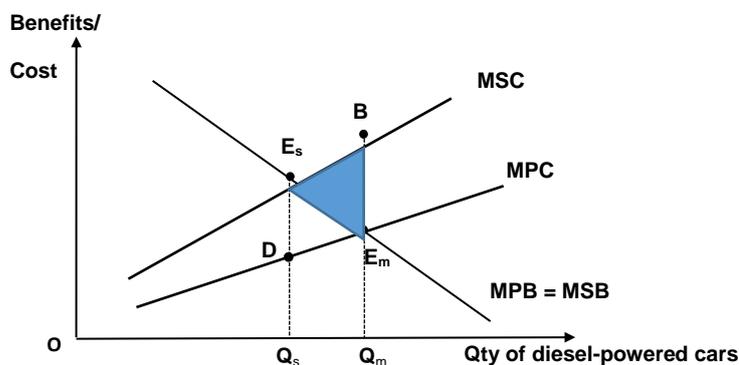
- ✓ *Explain what is meant by market failure*
- ✓ *Explain how the use of diesel-powered cars generates negative externality, leading to deadweight loss in the society.*

Identifying the sources of market failure in the market for diesel-powered cars

- The usage of diesel-powered cars **generates negative externalities** as it emits harmful pollutant such as nitrogen oxide and thus **pollutes the air** (extract 2).
- As other vehicles, the use of diesel-powered cars generates negative externalities arising from **road congestion**.
- As negative externalities cause the **underpricing** in the production and consumption of goods, price mechanism will allocate too much resources in the market for diesel-powered cars when there is no government intervention.

Explaining why the presence of negative externalities leads to market failure and welfare loss

- Negative externalities arise when the usage of diesel-powered cars affects the well-being of a third party negatively and the affected-party does not receive any compensation for the effect.
- When driving diesel-powered cars, consumers only consider their Marginal Private Benefits (MPB) and Marginal Private Cost (MPC). The private benefit is the satisfaction derived from the convenience of driving the car while the private costs comprise the price of the car and the fuel cost.
- To maximize their own satisfaction, they will choose to own or use cars to the point of Q_m where their $MPC = MPB$.
- However, these consumers do not take into account the Marginal External Cost (MEC) imposed on third parties.
- In extract 2, **these external costs are the air pollution and road congestion** which harm the well-being of the population. Road congestion causes longer journey times for other drivers on the road and result in a **less efficient transportation system**, hence lowering overall productivity in the economy
- Since MEC is positive, this implies that there is a divergence between MSC and MPC; and $MSC > MPC$ as $MSC = MPC + MEC$. This is illustrated below.



- To society, the social optimum is at Q_s where $MSB = MSC$, as this maximizes society welfare.
- As such, since $Q_s < Q_m$, there is an **overconsumption (excessive ownership or use) of diesel-powered cars** by $Q_s Q_m$.
- There is **underpricing** in the usage of diesel-powered cars and society incurs more resources than what car owners are paying, leading to **welfare loss which is the use of resources that brings about net loss to society**.
- There is a welfare loss of $E_s E_m B$ and one of the forms of welfare loss is the total loss in national income due to various medical illnesses caused by air pollution and lower productivity due to congestion.
- Therefore, the price mechanism has failed to allocate resources in an efficient manner and thus government needs to intervene in this market to improve society's welfare.

Level	Descriptor	Marks
L3	<ul style="list-style-type: none"> • A developed explanation of market failure from the usage of diesel-powered cars using economic analysis. • Good use of examples in explanation. 	5 – 6

	<ul style="list-style-type: none"> Limited or no conceptual inaccuracies in explanation. 	
L2	<ul style="list-style-type: none"> An underdeveloped explanation of market failure using economic analysis. Limited or no use of examples in explanation. Some conceptual inaccuracies in explanation. 	3 – 4
L1	<ul style="list-style-type: none"> For an answer that is largely inaccurate or irreverent. Severely lacking in economic analysis. 	1 – 2

(g) With reference to Extract 3, evaluate the policies adopted by the Chinese government to increase the production of electric vehicles in China.

[9]

Skills:

- Identify the policies adopted by the Chinese government to increase the production of electric vehicles in China.
- Explain how these policies would increase equilibrium output in the market.
- Evaluate the policies using appropriate criteria such as effectiveness and sustainability of the policies.

Introduction

- The Chinese government has given out **subsidies to producers and encouraged innovation** to increase production of electric vehicles in China.
- The rationale of these policies is to reduce the use of fuel-based vehicles so as to address the problem of market failure due to negative externalities as explained in part (f).

Explaining the policy of subsidy

- A subsidy to producers is meant to lower the cost of production to producers (government absorbs part of the cost) to encourage a higher production level.
- When subsidies are given to the producers, cost of production will fall, and supply will increase. A surplus occurs and there is downward pressure on price. Thus, subsidies will lower the price of electric vehicles.
- Lower prices of electric vehicles will **reduce the demand for fuel-based ones**.

Evaluating the policy of subsidy

- The subsidy can lead to **complacency among firms**, which has led to the production of **electric vehicles of poor quality** and loss of competitiveness.
- The **effectiveness** of subsidy to increase production also **depends on the price elasticity of demand of electric vehicle**. The demand of electric vehicle could be said to be price inelastic as it may be a poor substitute to diesel-powered vehicle. Therefore, even if the price of electric vehicle falls, the increase in output may be very small in extent as drivers are not very price sensitive, making the policy of subsidy an ineffective one and resulting in wastage of resources as the intended outcome could not be achieved.
- Moreover, this policy of subsidizing the producers of electric vehicle may not be **sustainable** as it will strain the Chinese government's limited budget. To sustain the subsidy, the Chinese government may need to raise tax in the future or reallocate resources from other sectors → incurring an opportunity cost which could have been better used such as infrastructure or healthcare.

Explaining the policy of encouraging innovation

- The Chinese government has also tried to encourage innovation among Chinese tech firms in its attempt to increase production of electric vehicle such as **making an internet-connected electric vehicle**. This would **improve the quality of electric vehicle** and catered more to the preference of the increasing tech-savvy Chinese population.
- Encouraging innovation in this case would result in an **increase in demand** for electric vehicle as consumers are more attracted to the higher quality electric vehicles. The increase in demand would result in a shortage of electric vehicle and put upward pressure on price. This would then act as a signal for producers to increase production of electric vehicle.

Evaluating the policy of encouraging innovation

- The policy may be not very **effective** as the **success of innovation is not guaranteed**, leading to **uncertain outcomes**. Innovation may fail, and this will result in wastage of resources as a result as well.
- Moreover, **innovation takes time** and it will only increase production of electric vehicle in the **long run**. Hence it will not be able to increase production of electric vehicle immediately.
- In addition, innovation will incur **huge expenses for the firms** as research and development (R&D) is expensive as well. Some firms may not have the necessary resources to innovate and hence it may not be **feasible** for all firms to conduct innovation.

Conclusion

- In view of the possible constraint faced by firms and to speed up the innovation process, the **Chinese government may also need to provide R&D grants for the firms**.
- The policy of **encouraging innovation is also a more effective long-term policy** while the **policy of subsidy to producers is more effective as a short-term policy** as shown by the huge number of low quality electric vehicles on the streets in China.

Level	Descriptors	Marks
L2	<ul style="list-style-type: none"> • A developed and balanced analysis of two policies implemented by the Chinese government to increase production of electric vehicles. • max of 4 marks for two policies but not well-developed. • Good use of examples from the extracts • Limited or no conceptual inaccuracies in explanation 	4-6
L1	<ul style="list-style-type: none"> • A developed but one-sided analysis of a policy implemented by the Chinese government to increase production of electric vehicles. Or <ul style="list-style-type: none"> • A balanced but underdeveloped analysis of a policy implemented by the Chinese government to increase production of electric vehicles. • Some or no use of examples from the extracts. • Some conceptual inaccuracies in explanation. 	1-3
Evaluation		
E2	Valid evaluative comments with clear criteria e.g. effectiveness or sustainability of the policies.	2-3
E1	Attempt at evaluating but without elaboration or explanation	1

(h)	Discuss whether increasing production of electric vehicles, together with driverless and ride-hailing transportation, will mean that governments do not need to intervene in the public transport market of buses and trains.	[12]
<p>Skills:</p> <ul style="list-style-type: none"> • Explain the rationale of government intervention in the public transport market of buses and trains → to improve resources allocation in the land transport market. • Explain why government may not need to intervene in the public transport market of buses and trains due to increasing production of electric vehicles, together with driverless and ride-hailing transportation. • Provide an alternative perspective on why government may still need to intervene in the public transport market of buses and trains. • Provide an overall judgement on whether there is a need for government to intervene in the public transport market of buses and trains. <p>Introduction: unpacking and identifying the need for government intervention in the public transport market of buses and trains</p> <ul style="list-style-type: none"> • Government intervention is needed when the price mechanism is unable to allocate resources efficiently or equitably. • In this case, government intervene in the public transport market of buses and trains due to negative externalities generated from usage of fuel-based vehicles (air pollution and road congestion) as well as equity concern. • Public transport is a substitute to various forms of private transport. Hence governments intervene in the public transport market of buses and trains using policies such as subsidies or regulation to reduce price of public transport as well as improving quality of the trains and buses to make it a strong substitute to private transport (fall in demand). This would address the problem market failure in the market for car usage where there is over-allocation of resources. • Public transport is also used by the masses and a necessity for transportation purposes → there is a need for government to ensure public transport is affordable, especially for the lower income. <p>Explaining the basis of the suggestion in the questions (with electric vehicles, driverless and ride-hailing transportation, governments do not need to intervene in public transport market)</p> <ul style="list-style-type: none"> • The development of autonomous ride-hailing using electric vehicles can correct market failure through market forces → less pollution and fall in car ownership • The increase in production of electric vehicles means less harmful pollutants are being released, as car owners switch from diesel-powered cars to the more environmentally friendly electric vehicle. This would reduce the negative externalities from air pollution. • Moreover, ride-hailing will be much cheaper with the use of autonomous electric vehicles as the bulk of the cost of ride-hailing is accounted to the driver (Extract 4). Car ownership may thus fall as consumers switch from car ownership to ride hailing. 		

Evaluation: While the options of electric vehicles and ride hailing reduce air pollution, **there will still be the market failure due to traffic congestion** if too many cars on the road, including driverless ones.

- The increasing use of ride-hailing in autonomous electric vehicle **will worsen road congestion instead as consumer switch from using public transport to ride-hailing** when ride-hailing becomes cheaper and is more comfortable.
- Ride-hailing companies such as Uber may increase their capacity by adding more cars on the road in anticipation of increasing use of ride-hailing.
- Therefore, **government intervention in public transport is still needed to reduce the number of vehicles on the road to manage road congestion.**

Evaluation: Government intervention in public transport is still needed to ensure the **affordability** of mass land transportation.

- While the increase in usage of autonomous electric vehicle may lead to a more efficient allocation of resources, **government intervention may still be needed due to equity concern.**
- Although the cost of ride-hailing may be reduced due to the autonomous electric vehicle, it may be still too expensive, especially for the lower income. Without government intervention in the public transport market, **the lower income may not have affordable mode of transport**, affecting their cost of living and quality of life.
- For example, the **Public Transport Council (PTC) regulate public transport fares in Singapore** by ensuring that the price charge reflects market dynamics (such as changes in operating cost and ridership) but remains affordable. Students and senior citizens are also given concessionary fare at lower prices.
- In addition, the **prohibitive investment and operation costs may also act as a constraint for private firms to operate public transport of buses and train**, especially that of trains since train railways are also needed. Therefore, government needs to provide for these buses and trains if private firms are unable to do so since government has greater ability to do so as it can raise tax to fund for the public transport.

Evaluation: However, the funding of public transport will put a **huge strain on government budget**, hence incurring a huge **opportunity cost** where the government budget could be spent on other more productive areas. Raising tax to fund for the public transport has also trade-offs that consumers have lesser disposable income and hence purchasing power, resulting in lower material standard of living in the short term if income tax was raised. Therefore, intervention does not necessarily mean providing free public transport. A reasonable extent of fares on consumers will be needed to ensure sustainability of the public transport model. **It is also important that the public transport is of sound quality in comprehensiveness and reliability to make it a viable alternative to private transport.**

Conclusion: Coming to a well-reasoned judgement on the need for government intervention in the public transport market of buses and trains with increasing production of electric vehicles, together with driverless and ride-hailing transportation.

- There is still a need for government intervention in the public transport market of buses and trains even if autonomous electric vehicle and ride hailing become more affordable because traffic congestion and equity concerns will remain.

- It is also critical for the government to manage vehicle population growth and ensuring true pricing in vehicle usage because if these are not carefully calibrated, market failure in land transport will not be addressed.

Level	Descriptors	Marks
L3	<ul style="list-style-type: none"> • For a well-developed and balanced answer that considers both efficiency (air pollution and congestion) and equity issues • Low level 3 awarded for a well-developed and balanced answer that fails to recognize that congestion and equity are also key reasons for government intervention in public transport, not just air pollution • Discussion considers the trends mentioned in question 	7-9
L2	<ul style="list-style-type: none"> • Undeveloped answer that considers only air pollution and congestion in discussion OR <ul style="list-style-type: none"> • Undeveloped answer that considers only air pollution and equity in discussion Or <ul style="list-style-type: none"> • Answer is confined to discussion of government intervention in public transport, with little contextualization to trends mentioned in question 	4-6
L1	<ul style="list-style-type: none"> • For an answer that is largely irrelevant or inaccurate • For an answer that lacks economic reasoning 	1-3
Evaluation		
E2	Valid evaluative comments with clear explanation, providing an overall judgement on whether government intervention in the public transport market is needed with increasing production of electric vehicles, together with driverless and ride-hailing transportation.	2-3
E1	Attempt at evaluating but without elaboration or explanation	1

[Total: 45]

Question 2: UK's Growth and Economic Dynamism

Table 1: Economic indicators of the UK economy (Annual % change)

	2015	2016
Real GDP growth rate	2.3	1.8
Inflation rate	0.4	1.0
Unemployment rate	5.4	4.9

Table 2: Changes in UK's GDP composition by industry (%)

	Manufacturing Industries	Services-producing Industries ¹	Other Industries
2006	22.1	77.3	0.6
2016	19.2	80.2	0.6

¹Wholesale & Retail Trade, Transportation & Storage, Accommodation & Food Services, Business, Finance & Insurance, Information & Communications and other Services

Sources: *Various*

Extract 5: Better than expected performance for the UK economy since the Brexit vote

Following UK's vote to leave the European Union (EU) in June 2016, most economists believed that a recession was imminent. But there has been no recession. What went right?

Firstly, economists' worries that heightened uncertainty would prompt households to rein in their spending and businesses to put investment plans on hold were unfounded. Meanwhile, Britain remains an attractive place for foreign investors, in part because of its trusted legal system and low rate of corporation tax. The global economy has also helped. The Brexit vote coincided with the beginning of the first worldwide economic upswing in years.

The question is whether this unexpectedly good performance can continue. As UK's departure from the EU nears, businesses may start to get more jittery. If investment spending is cut, then consumers will eventually start to feel the pinch. And Brexit itself, which is likely to leave Britain with severely reduced access to its largest export market, will have profoundly negative long-term economic consequences.

Source: *The Economist*, 15 January 2018

Extract 6: Issues facing UK beyond Brexit

Britain has deep structural problems. The economy has been too dependent on debt-driven consumer spending and suffered from decades of underinvestment in public infrastructure. The availability of cheap workers has also meant companies have less incentive to splash out on expensive but efficiency-enhancing machines.

But one point is worth making. Today, the makeup of growth is changing all thanks to the pound's fall in the foreign exchange market which is helping to rebalance the economy away from an excessive reliance on consumer spending, even though the boost to exports and national income would be bigger had it not been for the insignificant growth in industrial capacity over the past four decades.

Source: *The Guardian*, 15 March 2018

Extract 7: The changing structure of the UK economy

Since 2011, the UK's manufacturing sector has suffered a fresh era of decline as it relies on an expansion of low value-added assembly line roles in industries. This is far from their dream of being the source of new high value-added jobs in research and development. Output has barely risen in the past five years despite a 5% increase in the number of jobs created, revealing that the driving force of year-on-year productivity improvements have eluded the sector.

This is in contrast with the UK's services industries where employment and output is growing faster, especially in face-to-face services such as personal care. These service jobs are more difficult to automate than manufacturing or information services, which gives more room for these industries to come up with innovation to create personalised and niched services. But this may not always be possible, due to limited financial resources by the smaller companies.

All these reflected the changing structure of the UK economy, where the manufacturing share of its gross domestic product (GDP) has been on a downtrend, while the services sector has grown at a higher rate. With productivity growth in the services sector rising at a more moderate pace than in manufacturing, overall labour productivity growth has likewise been affected. As the size of services-producing sector increases, the ability of the UK economy to boost and sustain productivity growth rates is going to be very important.

Source: *The Guardian*, 21 October 2016

Extract 8: UK can still achieve economic dynamism

When a country is dynamic, it is more resilient to shocks, can grow more rapidly without generating inflationary pressure or creating risks to financial stability and can also be associated with more effective competition.

UK has a falling total fertility rate and an ageing population. However, many economists suggest that demographics is not destiny. While vibrant cities do attract people and add to the labour force, the main source of growth and dynamism is not headcount but productivity growth. This goes to show that the UK can still achieve economic dynamism in the face of demographic changes but how exactly can this be achieved?

Often, governments tend to champion specific sectors such as manufacturing or industries such as green technology. True dynamism flows from continuous innovation, experimentation, adaptation, and change, all of which raise productivity over time. These productivity gains, in turn, lift incomes and drive greater consumption. This fuels more innovation and a dynamic economy thus expands in a healthy, sustainable way.

According to the Grant Thornton's Global Dynamism Index released in 2015, the UK ranks 27 out of 60 economies for its overall growth potential contributed by a combination of factors, including political and economic stability, low level of legal and regulatory risk, intellectual property filing rates and innovative businesses drawing from a global talent pool. For the UK to maintain and improve its competitiveness, it should do more to encourage investments in infrastructure, technology, productivity and other dynamic indicators which ultimately power the economy and instil confidence in its long-term growth prospects.

Sources: *Various*

Questions:

- (a) What conclusion would you draw from Table 1 about the overall economic performance of the UK economy in 2016 compared to 2015? [4]
- (b) Using an AD/AS diagram, explain two reasons why the UK economy was expected to slip into recession after deciding to leave the European Union. [5]
- (c) With reference to Extract 6,
- (i) Explain how the fall in the value of pound might affect general price level in the UK. [3]
- (ii) Explain what it means by “the boost to exports and national income would be bigger had it not been for the insignificant growth in industrial capacity over the past four decades”. [2]
- (d) Using Extract 7, discuss whether all countries should follow the UK economy by expanding their services industries to achieve higher economic growth. [9]
- (e) In light of the case materials provided, discuss the policies that the UK government could adopt to maintain a low rate of unemployment. [10]
- (f) Extract 8 suggests that the UK can still achieve economic dynamism despite her demographic changes.
- Discuss the view that ageing population is not an obstacle to the UK economy in achieving economic dynamism. [12]

[Total: 45]

H1 Economics Prelim Examinations Suggested Answer

Question 2: UK's Growth and Economic Dynamism

**Note to students: Quotes from the extracts have been reproduced in the suggested answer key for learning purposes. You are only required to ACKNOWLEDGE the extract used i.e. "From Extract 5, it suggests that...". You MUST NOT reproduce the quotes.*

(a) What conclusion would you draw from Table 1 about the overall economic performance of the UK economy in 2016 compared to 2015? [4]

- Real GDP growth rate has fallen but still positive → real NY has increased but at a slower rate.
 - Inflation rate is positive and has slightly risen → GPL is increasing at a faster rate.
 - Unemployment rate has fallen → more people were able to find a job compared to 2015.
 - Overall, UK's macroeconomic performance is positive but considered generally weak, as indicated by the low economic growth and inflation rates.
- ✓ 3m for interpreting changes in UK's economic indicators
 ✓ 1m for overall judgement of UK's macroeconomic performance
-

(b) Using an AD/AS diagram, explain two reasons why the UK economy was expected to slip into recession after deciding to leave the European Union. [5]

- Poor economic sentiments → falling C and I → falling AD → fall in real NY (*Extract 5: "Firstly, economists' worries that heightened uncertainty would prompt households to rein in their spending and businesses to put investment plans on hold"*).
 - Loss in EU as a key export market → falling X → falling AD → fall in real NY (*Extract 5: "And Brexit itself, which is likely to leave Britain with severely reduced access to its largest export market"*).
- ✓ 1m for diagram showing leftward shift in AD causing a fall in real NY
 ✓ 2m for each reason to explain falling real NY using Extract 5 and economic analysis (falling AD)
-

(c) With reference to Extract 6,

(i) Explain how the fall in the value of pound might affect general price level in the UK. [3]

- A weaker pound would increase UK's import prices in its own currency as a unit of the currency can now buy fewer foreign goods → increases domestic costs of living and production → reduces SRAS → increases domestic GPL.
 - A weaker pound would also decrease UK's export prices in foreign currencies → increases X (assuming $PED > 1$) → increases AD → increases domestic GPL.
- ✓ 1m to explain the effect of weaker pound on import or export prices
 ✓ 2m to explain the effect on GPL using economic analysis (either through SRAS or AD)
-

- (c) Explain what it means by “the boost to exports and national income would be bigger had it not been for the insignificant growth in industrial capacity over the past four decades”. [2]**

- UK economy is producing near maximum productive capacity
 - This implies that there are insufficient resources available to produce goods and services
→ despite the increase in exports, there will be limited growth in real NY once maximum productive capacity is reached.
- ✓ 1m in identifying UK producing near maximum productive capacity
- ✓ 1m to explain how the lack of spare productive capacity limits the growth in X and real NY

- (d) Using Extract 7, discuss whether all countries should follow the UK economy by expanding their services industries to achieve higher economic growth. [9]**

Question approach:

- Show understanding that higher economic growth refers to real national income increasing at a faster rate.
- Explain how expansion of services industries has risen in demand and are perceived to generate greater value-added compared to manufacturing industries, hence allowing for higher economic growth rates.
- Consider the appropriateness of countries adopting this strategy. Notice that the question is phrased as “all countries” which allows for scope in discussion e.g. Should developing countries follow UK in doing so? What are some of the challenges faced by countries when using the expansion of services industries to boost economic growth?

Introduction:

- Higher economic growth suggests that real national income is increasing at a faster rate.
- As shown in *Table 2* and *Extract 7*, the UK economy has expanded its services industries over time (*Extract 7: “the manufacturing share of its gross domestic product (GDP) has been on a downtrend, while the services sector has grown at a higher rate”*).
- Although services industries are growing in demand and generate more value to a country’s national output, the type of services provided must be examined. If countries were to allocate resources away from manufacturing to services industries, the returns from doing so may be insignificant if low-value services are produced.

1. **Why countries should follow the UK economy in expanding their services industries to achieve higher economic growth:**
 - For UK's services industries, growth in output is most evident in face-to-face industries (*Extract 7: "employment and output are growing faster, especially in face-to-face industries such as personal care"*). **The expansion of services industries in response to the higher demand for services will thus help to generate more employment and output hence helping to raise UK's economic growth rates** as shown by the increase in services share of gross domestic product (GDP) in UK.
 - There could also be more room for firms to create unique services with $PED < 1$, hence allowing firms to charge a higher price premium, increasing total revenue earned. **By providing personalised services such as those in the insurance and banking sectors, UK may be able to generate higher value-added to national output, hence achieving higher economic growth rate.**
 - **Evaluation:** However, just like manufactured goods, there is a wide range of services that can be produced. **Low value-added services do not add as much value to a country's national output and employment compared to high-end manufactured goods such as computer chips.**

2. **In some countries, resources may be more efficiently used in producing manufactured goods compared to services.**
 - **To achieve higher economic growth, efficient use of resources in a country is needed to generate maximum output and employment.**
 - For developing countries with abundant cheap low-skilled labour, they should expand manufacturing industries instead of services industries to attract Foreign Direct Investment (FDI) looking to expand their manufacturing bases overseas.
 - For the UK economy, the pursuit of services expansion is partly driven by the addition of mostly low value-added jobs in manufacturing industries (*Extract 7: "the UK's manufacturing sector has suffered a fresh era of decline as it relies on an expansion of low value-added assembly line roles in industries"*). Hence, the expansion of services is adopted to create more high value-added jobs to drive productivity growth needed to support higher growth rate in UK which is producing very near to its maximum productive capacity (*Extract 6*).

Synthesis: Overall well-reasoned judgement on whether all countries should follow the UK economy in expanding services industries to achieve higher economic growth.

- The decision to expand services industries is largely dependent on the country's factor endowment. While there may be a rise in the demand for services, the demand for manufactured goods is still high and increasing with income levels.
- It is important that countries use their resources efficiently to generate maximum output and employment regardless of their decision to expand services or manufacturing sectors.
- Ultimately, as economies develop, they will naturally transit from a manufacturing-driven to a services-based growth path. Countries should not rush in expanding services industries simply because of its higher value-added and growth in demand.

Question (d) mark scheme:

Level	Level Descriptors	Marks
L3	<ul style="list-style-type: none"> • Conceptually accurate and well-developed analysis in explaining these key ideas: <ul style="list-style-type: none"> ○ Services industries are able to generate more output and employment hence driving higher economic growth. ○ The decision to expand services industries is dependent on the country's factor endowment. Resource should be used efficiently regardless of the country's decision to expand services or manufacturing industries. 	5-6
L2	<ul style="list-style-type: none"> • Conceptually correct but answer is largely one-sided or balanced but undeveloped. • May contain minor conceptual errors. 	3-4
L1	<ul style="list-style-type: none"> • Descriptive i.e. lacks economic analysis. • Contains major conceptual errors. 	1-2
E2	<ul style="list-style-type: none"> • Answer recognizes and justifies why both demand-management and supply-side policies are needed in UK. • <i>E.g. Answer argues that a country's resources must always be used efficiently to generate maximum output and employment. For developing countries, abundant cheap low-skilled labour is able to attract FDI that are looking to set up manufacturing bases overseas.</i> 	2-3
E1	<ul style="list-style-type: none"> • Superficial / simplistic evaluation statements without justification. • <i>E.g. Answer states that some countries may not have the resources suitable to support expansion of services industries such as skilled labour.</i> 	1

(e) In light of the case materials provided, discuss the policies that the UK government could adopt to maintain a low rate of unemployment. [10]

Question approach:

- Show clear understanding that unemployment is an economic problem caused by changes in both the demand and supply sides of the economy and that to deal with this problem will require policy measures addressing both these sides.
- Case materials provided suggest that UK is facing both demand-deficient and structural unemployment caused by the decision to leave EU and ongoing expansion of services industries respectively.
- Discuss policies in terms of effectiveness and/or appropriateness.

Introduction: The UK government should use both demand and supply-side policies to maintain a low rate of unemployment in the country.

- Low unemployment suggests a level that is very close to the natural rate of unemployment. Typically, statistics on job vacancies indicate that the number of jobs available matches the number of unemployed.
- UK faces both demand-deficient and structural unemployment.
- Demand-management policies are largely aimed at enhancing jobs creation while supply-side policies help in sharpening UK's competitiveness and improving workers' employability as well as mobility.

1. In view of the possible fall in AD caused by UK's decision to leave EU, the UK government should adopt expansionary fiscal policy to counter the possible rise in demand-deficient unemployment.

- As mentioned in (b), UK's decision to leave the EU can cause AD to fall relative to LRAS due to falling C, I or X. With firms experiencing a fall in profits, they may respond by laying off workers to cut costs, hence triggering demand-deficient unemployment.
- **While Extract 5 suggests that UK's economy has managed to avoid slipping into a recession, the risk of falling AD is still present and very much dependent on economic sentiments as well as the country's ability to export to other markets that can help counter the decline in exports to EU which has all along been UK's largest export market.**
- Expansionary fiscal policy can therefore be used as a counter-cyclical approach. To increase AD, the UK government can adopt a budget deficit where government spending is raised and/or taxes are reduced so that government spending is more than tax revenue collected. For example, public sector hiring can be expanded and public infrastructure projects brought forward to create more jobs. As a result, the increase in demand for workers will rise hence reducing the risk of demand-deficient unemployment.
- **Evaluation:** However, if domestic economic sentiment is poor, AD may not increase significantly, hence causing expansionary fiscal policy to be less effective. More importantly, expansionary fiscal policy does not help to reduce the possible skills mismatch caused by economic restructuring despite being effective in creating jobs.

**Note to students: As the pound is already weakening (Extract 6), there is a lesser need for the UK government to adopt currency depreciation as its demand-management policy.*

2. Indeed, while jobs may be created, workers may not have the skills to take up these jobs. Therefore, supply-side policies are needed to support workers' transition from manufacturing to services-based industries as well as to develop new growth industries to compensate for declining industries, hence reducing both structural and demand-deficient unemployment.

- UK is expanding its services industries (*Extract 7: "the manufacturing share of its gross domestic product (GDP) has been on a downward trend, while the services sector has grown at a higher rate" and "this is in contrast with the UK's services industries where employment and output is growing faster"*).
- Therefore, there can be a mismatch between skills and job requirements in the labour market when workers laid off from manufacturing industries try to seek employment in services industries, hence triggering structural unemployment.
- **To reduce and prevent further worsening of structural unemployment, the UK government should provide skills training to improve workers' employability and mobility across industries.** This would help to create a labour culture anchored on life-long learning and continuous skills upgrading.
- **In addition, the UK government can adopt pro-competition supply-side policies or provide subsidies that encourage firms to adopt more technology and innovation, so as to produce high technology value-added goods and services** (*Extract 7: "These service jobs are more difficult to automate than manufacturing or information services, which gives more room for these industries to come up with innovation to create*

personalized and niched services. But this may not always be possible, due to limited financial resources by the smaller companies”). This would help to create new export demand, attract FDI hence preventing a possible rise in demand-deficient unemployment.

- **Evaluation:** However, supply-side policies require time to be effective. If demand-deficient unemployment is rising rapidly due to UK’s decision to leave EU, the UK government should use expansionary fiscal policy as it requires a shorter time to raise AD needed for jobs creation.

Synthesis: Overall well-reasoned judgement on the policies that the UK government should adopt to maintain a low rate of unemployment.

- In view of UK’s decision to leave EU and with expansion of services industries going on at the same time, both expansionary fiscal policy and supply-side policies are needed to enhance jobs creation rate and improve workers’ employability as well as mobility across industries.
- Although supply-side policies will only be effective in the long run, they should be implemented as an ongoing approach in UK which has been experiencing slowing productivity growth (*Extract 7: “With productivity growth in the services sector rising at a more moderate pace than in manufacturing, overall labour productivity growth has likewise been affected”).*

Question (e)’s mark scheme:

Level	Level Descriptors	Marks
L3	<ul style="list-style-type: none"> • Conceptually accurate and well-developed analysis in explaining why and how both demand-management and supply-side policies are needed in view of UK’s decision to leave EU and with economic restructuring going on at the same time. • Good use of relevant case information to support analysis. 	6-7
L2	<ul style="list-style-type: none"> • Conceptually correct but answer is largely focused on either demand-management or supply-side policies. • May contain minor conceptual errors. • Some use of case information to support analysis. 	3-5
L1	<ul style="list-style-type: none"> • Descriptive i.e. lacks economic analysis. • Contains major conceptual errors. 	1-2
E2	<ul style="list-style-type: none"> • Answer recognizes and justifies why both demand-management and supply-side policies are needed in UK. • <i>E.g. Answer argues that while jobs may be created, the risk of structural unemployment suggests that workers may not have the skills to take up these jobs hence suggesting the need for supply-side policies to be implemented alongside demand-management policies.</i> 	2-3
E1	<ul style="list-style-type: none"> • Superficial / simplistic evaluation statements without justification. • <i>E.g. Answer states that UK government should adopt demand-management policies in the short run and supply-management policies in the long run.</i> 	1

- (f) **Extract 8 suggests that the UK can still achieve economic dynamism despite her demographic changes.**

Discuss the view that ageing population is not an obstacle to the UK economy in achieving economic dynamism.

[12]

Question approach:

- Using case information provided, explain what it means by economic dynamism.
- Identify and explain the challenges that an ageing population poses to UK's productivity growth and connect this to the country's ability in achieving economic dynamism.
- Recognise and explain that while UK can still achieve economic dynamism if the government puts in place appropriate measures to raise productivity growth rate.

Introduction:

- According to *Extract 8*, economic dynamism refers to industries being engaged in a continuous cycle of innovation, experimentation, adaption and change, which then helps to bring about productivity improvements in the country over time. This would in turn make the economy more resilient to economic shocks, increase competitiveness and also allow it to grow without causing inflation.
 - **To achieve economic dynamism, governments are often actively involved in encouraging investments in infrastructure, technology, productivity and areas such as intellectual property filing rates.**
 - An ageing population in the UK does present several challenges in the form of reducing the country's attractiveness to FDI due to perceived (or actual) slower productivity growth as well as slower growth in innovation and R&D. These challenges further reduce UK's productivity which is already experiencing slow growth (*Extract 7: "With productivity growth in the services sector rising at a more moderate pace than in manufacturing, overall labour productivity growth has likewise been affected"*).
 - However, UK can still achieve economic dynamism despite facing an ageing population if appropriate policies are implemented to boost productivity growth.
- 1. An ageing population is indeed an obstacle to the UK economy's ability in achieving higher and sustained productivity growth required for economic dynamism.**
- Investor confidence in UK may fall as foreign companies find it less attractive to invest in due to the perceived lower productivity growth rate or due to the perceived less-relevant skills level of the elderly. Given that UK has just made its decision to leave EU (*Extract 5*), the uncertain economic sentiments coupled with an ageing population may cause Foreign Direct Investment (FDI) to slow down hence causing a slow down or slower growth in infrastructure and innovation spending.
 - In addition, the need for the government to finance the higher social spending associated with an ageing population may lead to an increase in taxes such as the corporate income tax. A higher corporate income tax further reduces UK's competitiveness to FDI and firms' after-tax ability to spend on R&D and innovation initiatives.
 - Moreover, although the elderly may be educated with tertiary education in UK, this does not guarantee that they will be productive, especially with technological advancement increasingly making skills obsolete.

- With countries being assessed in areas such as intellectual property filing rates, investments in technology and productivity according to the Grant Thornton's Global Dynamism Index (*Extract 8*), an ageing population can indeed be argued to reduce spending in these areas, hence lowering UK's ability in achieving economic dynamism.
 - **Evaluation: Ageing population does not necessarily mean a fall in productivity growth rate or FDI competitiveness. Whether the elderly remain productive is largely dependent on the role played by the UK government in encouraging life-long learning/skills upgrading. Similarly, whether UK remains attractive to FDI is largely dependent on the presence of conducive supply-side conditions critical for driving sustained productivity growth through innovation and R&D.**
2. **UK can still achieve economic dynamism despite its ageing population if appropriate policies are implemented to mitigate the challenges.**
- The UK government can implement both market-oriented as well as interventionist supply-side policies to drive innovation and R&D. For example, the elderly can be sent for reskilling or skills upgrading so as to improve their productivity.
 - In addition, the barriers to entry for certain industries can be lowered so as to increase competition among firms, hence raising the incentive for firms to innovate in order to retain market share.
 - Alternatively, the UK government can increase the inflow of foreign talents into the country, thus helping to speed up the slow productivity growth.
 - **Evaluation: Nevertheless, supply-side policies require time to take effect. Hence, it is likely that improvements to productivity growth will only be achieved in the long run.**

Synthesis: Overall well-reasoned judgement on whether the UK economy can achieve economic dynamism despite facing an ageing population.

- An ageing population does pose several challenges to UK's ability to achieve economic dynamism through the effects on productivity growth. However, with ongoing policies implemented to mitigate these challenges, UK can still achieve economic dynamism in the long run.
- **It is important that ageing population is viewed not just in terms of the challenges it brings but also the opportunities it presents.** For example, to meet the needs of the elderly, firms may become more motivated to carry out innovation and R&D work when venturing into new product markets. Examples of such markets would include healthcare services and personal transport devices such as e-scooters. Such demand-driven innovation will enhance the country's ability to achieve economic dynamism.

Question (f)'s mark scheme:

Level	Descriptors	Marks
L3	<ul style="list-style-type: none"> • Balanced and conceptually accurate analysis in explaining these key ideas: <ul style="list-style-type: none"> ○ An ageing population presents several challenges that will reduce UK's productivity growth rate. ○ However, the UK government can still achieve economic dynamism if there are appropriate policies implemented to mitigate these challenges. • Good use of relevant case information to support analysis. 	7-9
L2	<ul style="list-style-type: none"> • Conceptually correct but answer is largely one-sided or balanced but undeveloped. • Some use of case information to support analysis. 	4-6
L1	<ul style="list-style-type: none"> • Descriptive i.e. lacks economic analysis. • Contains major conceptual errors. 	1-3
E2	<ul style="list-style-type: none"> • Answer is able to generate a considered overall judgement on whether an ageing population will hinder the UK economy in achieving economic dynamism. • <i>E.g. Answer argues that while an ageing population can hinder UK's ability in achieving economic dynamism in the short run, appropriate government policies can be adopted to mitigate the potential fall in productivity growth rate.</i> 	2-3
E1	<ul style="list-style-type: none"> • Superficial / simplistic evaluation statements without justification. • <i>E.g. Answer states that an ageing population will indeed hinder UK's ability in achieving economic dynamism, especially in the short run.</i> 	1