

Surname <i>StemUp Model Solution</i>	Centre Number	Candidate Number
First name(s)		2



GCE AS

B520U10-1



MONDAY, 15 MAY 2023 – MORNING

ECONOMICS – AS component 1
Introduction to Economic Principles

1 hour

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	15	
2.	5	
3.	14	
4.	11	
5.	15	
Total	60	

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01

ADDITIONAL MATERIALS

A calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided. If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.



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Answer **all** the questions in the spaces provided.

1. **Figure 1: Income gap between highest and lowest 10% of earners in Singapore (Singapore dollars (S\$) per month)**

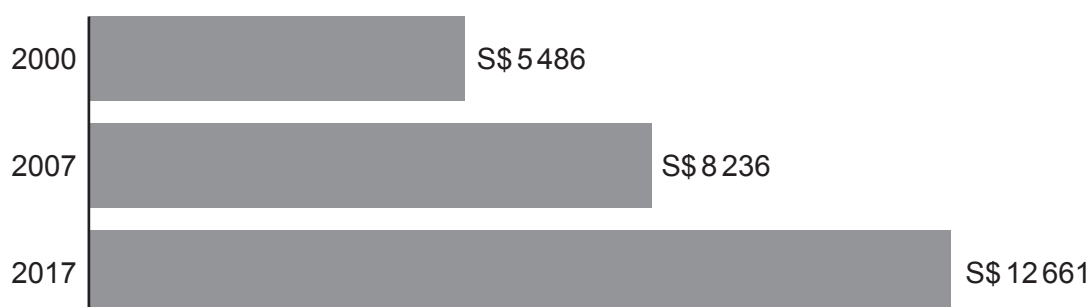
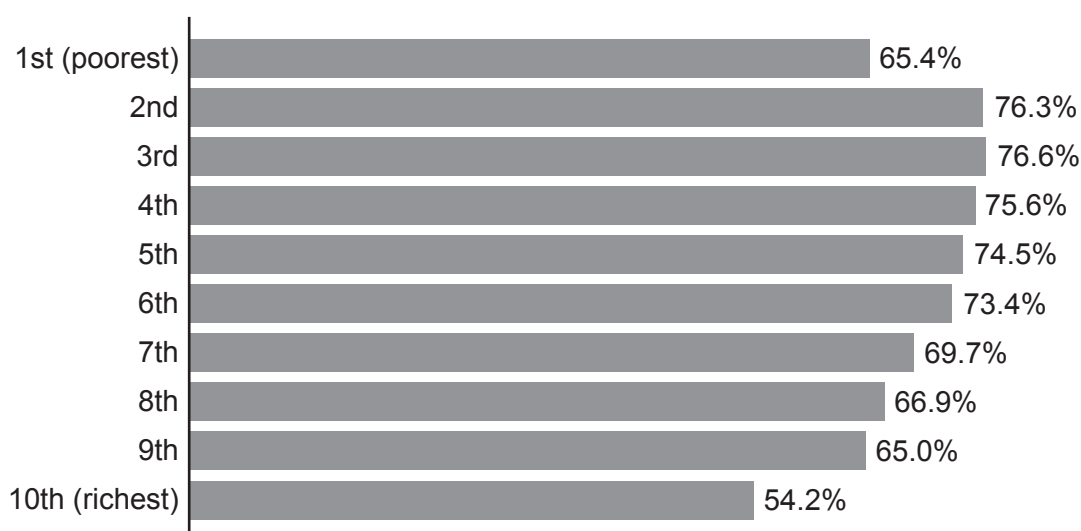


Figure 2: Income growth by decile 2007–2017 in Singapore



(a) Define the meaning of income inequality.

[3]

Income inequality is the uneven distribution of income between individuals or

households in an economy: a small % of the population (e.g. the richest decile, top

10%) receives a large % of total income, while a larger % of the population receives a

much smaller share, so there is a gap between high and low earners.

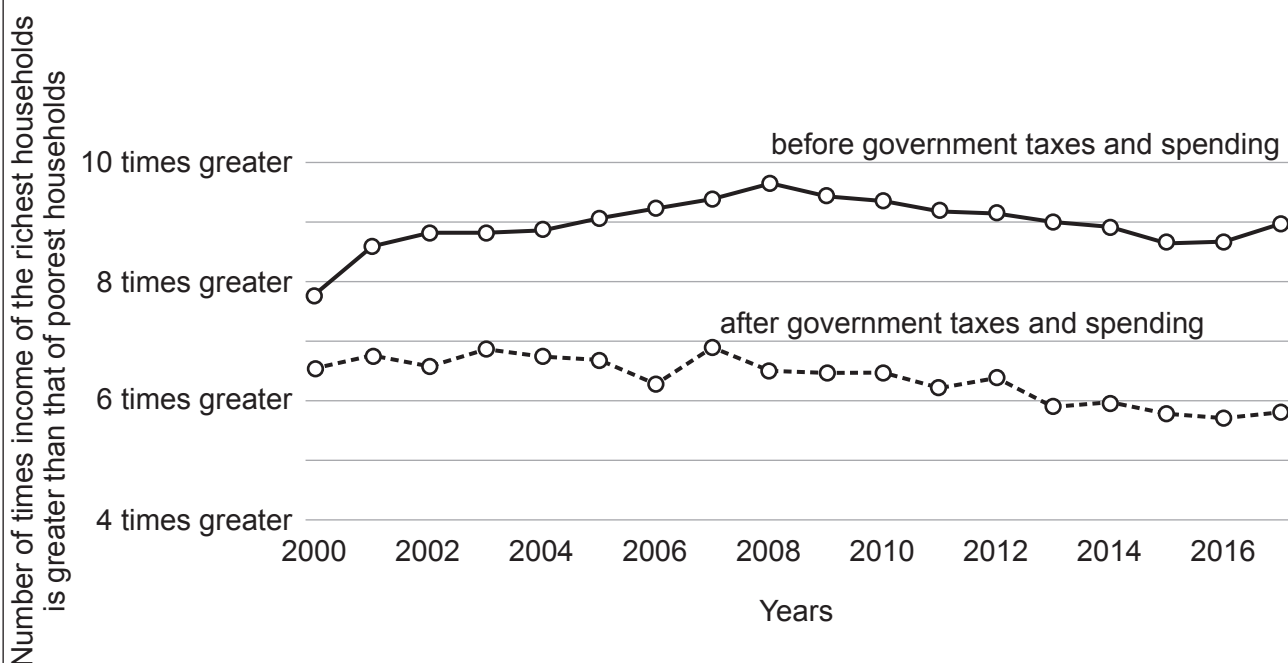


- (b) Using a numerical example, outline how the income gap in Singapore dollars could worsen even when income growth for low earners is faster than high earners. [4]

The absolute gap in S\$ can widen because a higher % rise in a small income can be fewer dollars than a lower % rise in a large income. E.g. a poorest-decile earner on S\$1 000 a month gains 65.4% (Figure 2) = +S\$654, to S\$1 654. A richest-decile earner on S\$10 000 gains only 54.2% = +S\$5 420, to S\$15 420.

The gap rises from S\$9 000 to S\$13 766, widening by S\$4 766, even though low earners grew faster, just as Figure 1's gap rose from S\$8 236 (2007) to S\$12 661 (2017).

Figure 3: Comparison of monthly Singapore household income for the richest 10% to the poorest 10%.



Over the period shown the Singapore Government has implemented policies including changes to government spending and taxation to try to reduce income inequality.

- (c) Using **Figures 1, 2 and 3**, consider how effective these policies seem to have been in reducing income inequality. [8]

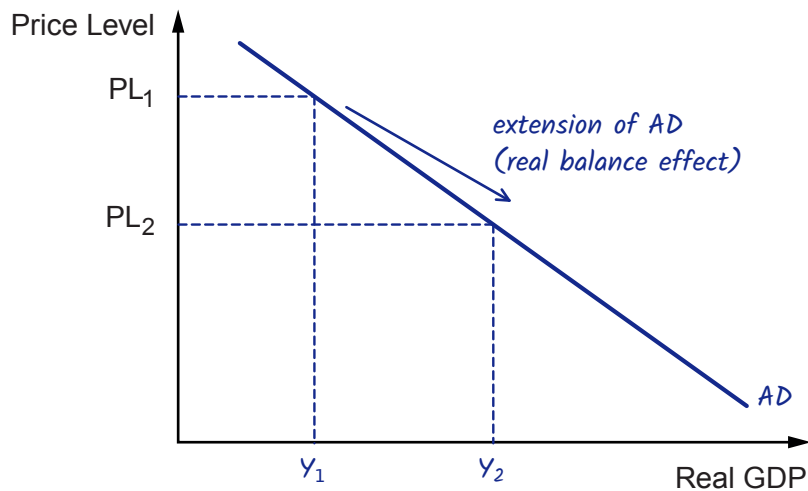
Figure 3 suggests the policies have had some success. Before taxes and spending the richest 10% earned about 7.8 times the income of the poorest 10% in 2000, rising to about 9 times by 2017, but after taxes and spending the ratio fell from about 6.5 to about 5.8 times. Intervention cut the ratio by 1.3 in 2000 but by 3.2 in 2017, more than double, so policy has become more effective. A progressive tax system takes a larger % of higher incomes, while spending on transfer payments, benefits and services such as housing and education raises the disposable income of the poorest, so post-tax income is more evenly distributed.

Figure 2 supports this: from 2007 to 2017 incomes of the 2nd to 6th deciles grew by 73.4% to 76.6%, much faster than the richest decile's 54.2%, so lower and middle earners gained a larger share of income.

However, Figure 1 shows the absolute gap between the richest and poorest 10% more than doubled from S\$5 486 in 2000 to S\$12 661 in 2017 (+131%), and the poorest decile's growth (65.4%) was slower than deciles 2 to 9, so the very poorest fell behind most of society. The after-tax ratio fell by only 0.7 in 17 years and was rising until 2007, so the rich are still almost 6 times better off. The fall after 2008 may also reflect market forces rather than policy, and high earners may avoid tax (Laffer curve).



2.



Drawing an aggregate demand (AD) curve, explain **one** reason why a reduction in the price level should lead to an increase in aggregate demand (AD). [5]

AD is total planned spending on an economy's goods and services at each price level:

$AD = C + I + G + (X - M)$. One reason it rises as the price level falls is the real

balance (wealth) effect: when the price level falls from PL_1 to PL_2 , the real value

(purchasing power) of households' savings and money balances rises, so they feel

wealthier, save less and increase consumption. As consumption is the largest component

of AD, real GDP demanded rises from Y_1 to Y_2 , a movement (extension) along the

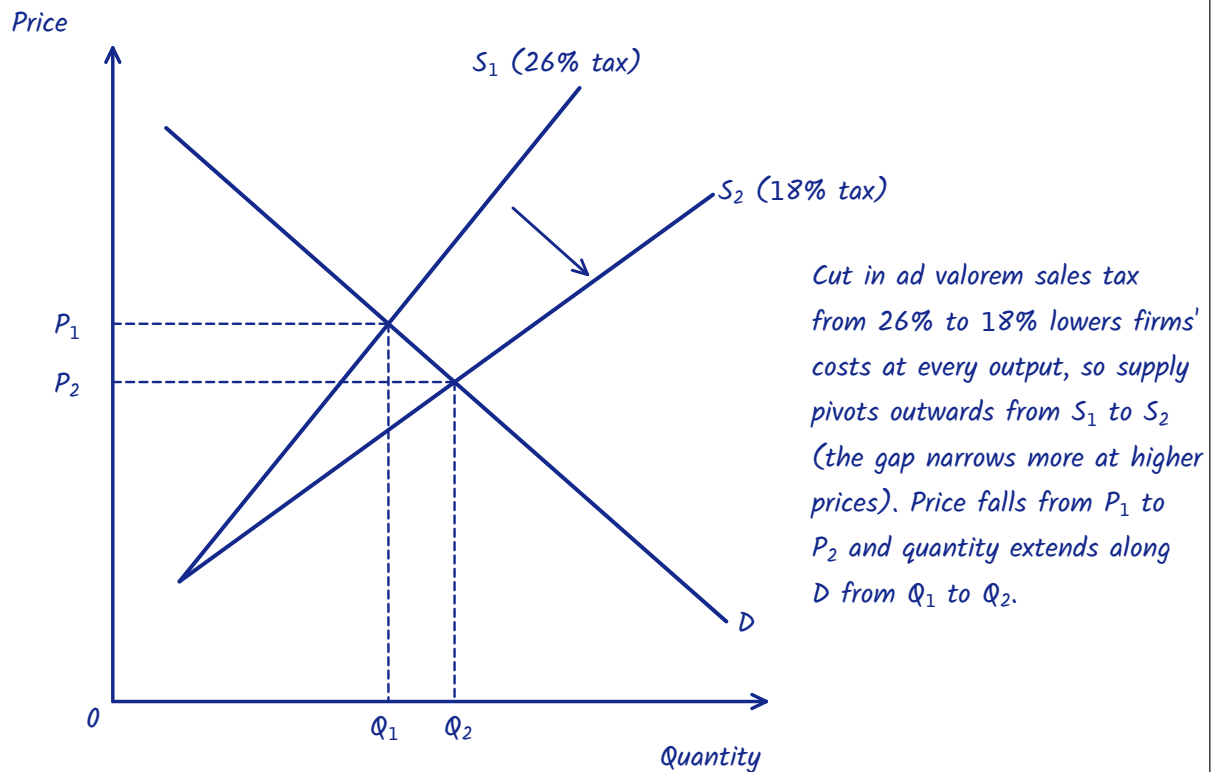
downward sloping AD curve, not a shift.



3. In 2014, Narendra Modi became India's Prime Minister promising that the “*acche din*” (good days) would come back due to his introduction of new economic policies.

One of his policies was to lower sales tax rates across the country from 26% to 18%.

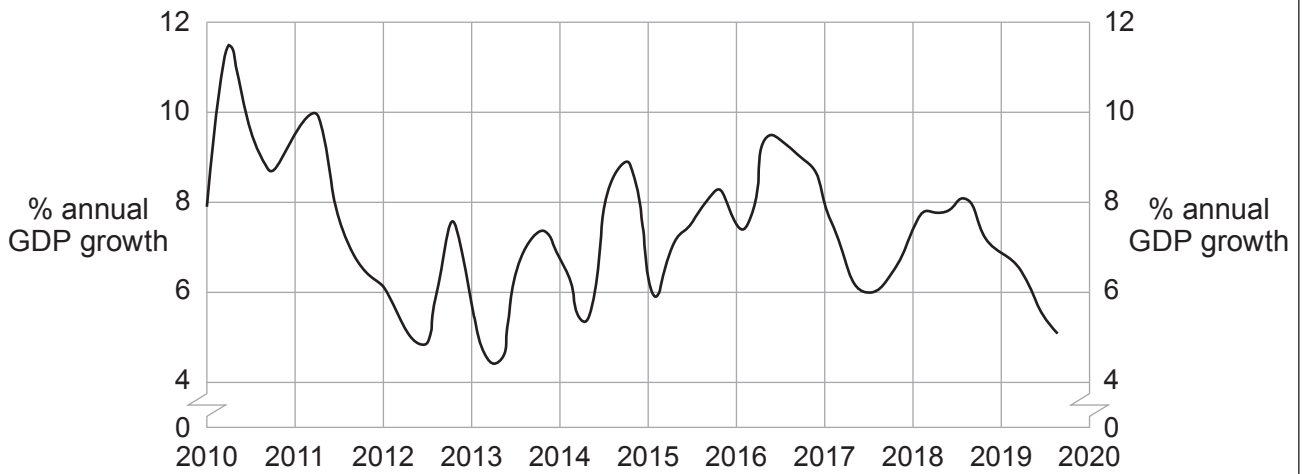
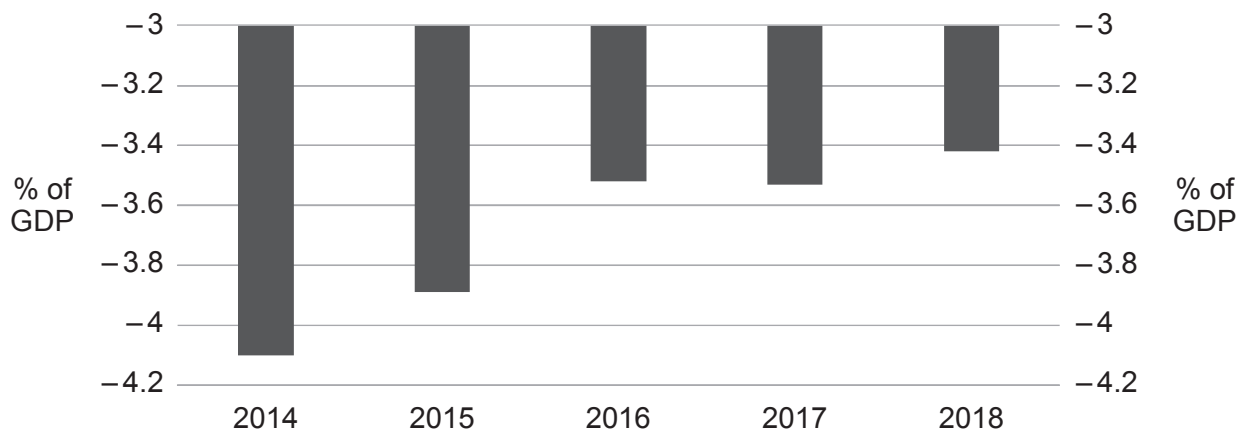
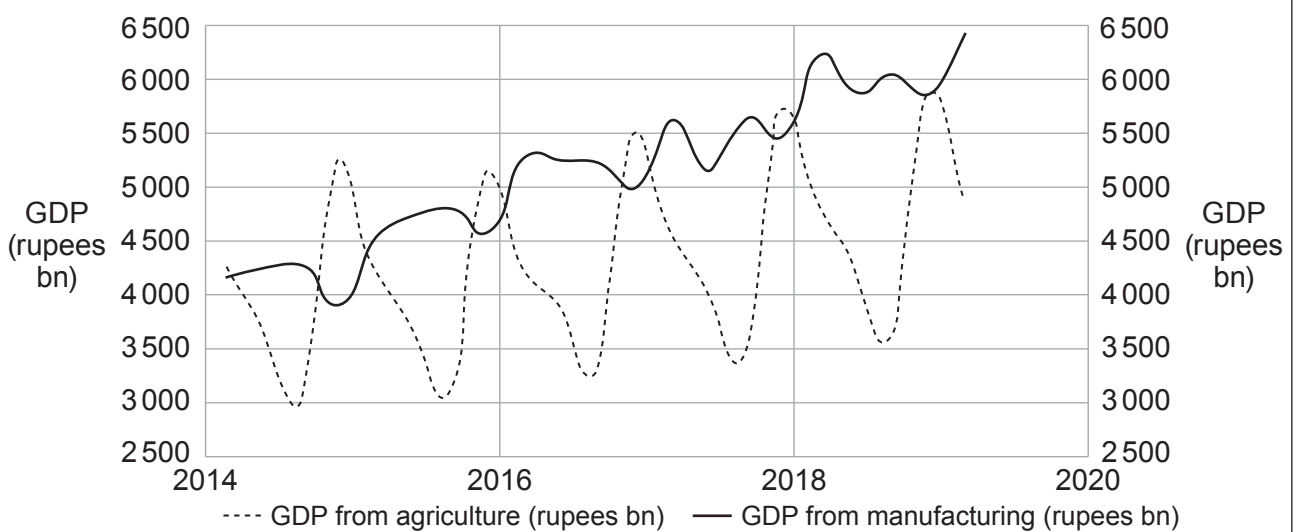
- (a) Using a demand and supply diagram, show the likely impact of this change in tax rates. [4]



Further policies included:

- Made in India Programme improving infrastructure, India's workers' skills and reforming labour laws.
- Maintaining the minimum price paid to producers of rice, wheat and pulses at the same price level.
- Improvements in rural India: increased rural house building (300%) and ensuring all villages had an electricity connection by 2018.



India GDP annual growth rate %**India Government Budget % of GDP****India GDP from Agriculture and Manufacturing (rupees bn)**

- (b) Using the data, discuss the extent to which Modi's economic policies (page 7) have been successful in bringing back the "good days" to the Indian economy. [10]

The "good days" can be judged against the macroeconomic objectives of strong economic growth, low unemployment, stable prices and sound government finances.

Cutting sales tax from 26% to 18% lowers prices (as in 3(a)), raising real disposable income and consumption, so $AD = C + I + G + (X - M)$ shifts right and real GDP rises; lower tax may also shrink the black economy, so more transactions are recorded and taxed. The Made in India Programme is a supply-side policy: better infrastructure and skills raise labour productivity and labour law reform cuts firms' costs, so LRAS shifts right, creating manufacturing jobs, lowering costs and making exports more competitive. Freezing minimum prices for rice, wheat and pulses stops food prices rising, leaving poor households more income for other goods. Rural house building (+300%) and electricity for all villages by 2018 raise AD now and productive potential later.

The data suggests some success. GDP from manufacturing rose from about 4 150bn rupees in 2014 to about 6 450bn in 2019 (+55%) and agriculture's peaks rose from about 5 250bn to 5 850bn (+11%), both record levels. Growth recovered from about 5.4% in 2014 to peaks of 8.9% in 2015 and 9.5% in 2016, and the budget deficit fell from 4.1% of GDP in 2014 to 3.4% in 2018, as higher GDP raises tax revenue. However, growth never returned to the 10% to 11.5% of 2010 to 2011; it fell to 6% in 2017 and to about 5% by late 2019, the lowest since 2013, so the good days seem to be fading. The deficit is a % of GDP, so its fall may reflect rising GDP rather than the policies, and it stopped improving after 2016 (about -3.5% in 2016 and 2017). Agriculture swings between about 3 500bn and 5 850bn rupees with the harvests, and manufacturing was already rising, so other factors such as world demand matter. Supply-side policies take years to work, easier hiring and firing may reduce job



4. Government funded outdoor gym equipment has become available in some UK parks.

The main features are:

- no charge for their use
- aimed at adults of all fitness levels
- easy to use – instructions are included but each user is responsible for using the equipment safely.



- (a) State the difference between an economic good and a free good.

[3]

A free good has zero opportunity cost: it is not scarce, so it can be consumed in any quantity without reducing the amount available to others (e.g. air), and it is not traded. An economic good is produced using scarce resources, so it has an opportunity cost in production or consumption and therefore has value and a price. The outdoor gyms are free to use but are economic goods, as they use scarce resources and tax revenue.

- (b) Discuss whether local government should provide outdoor gyms.

[8]

For: no profit-making firm would provide gym equipment with no charge for its use, so the market would under-provide it. Exercise is a merit good with positive externalities: users gain private benefits of better health and productivity, so higher incomes, while third parties gain from fewer health problems for the NHS to treat and employers from a healthier workforce. The social benefit exceeds the private benefit, so without provision there is under-consumption and a welfare loss. As the gyms are free, in parks and aimed at adults of all fitness levels with easy-to-use instructions, low-income adults who cannot afford private gym fees can use them, and parents can exercise while children play, helping tackle the UK's fitness and obesity problem. The council may also save on benefits if healthier residents are able to work.

Against: the gyms have an opportunity cost, as the tax revenue could fund social care or schools. Such equipment is often used mainly by the already fit, so the extra health



benefit may be small. As each user is responsible for using it safely, information failure (not reading the instructions) could cause injuries, an external cost to the NHS, so there could be a net welfare loss and government failure. They also need maintenance, may be vandalised and could spoil the look of the park.

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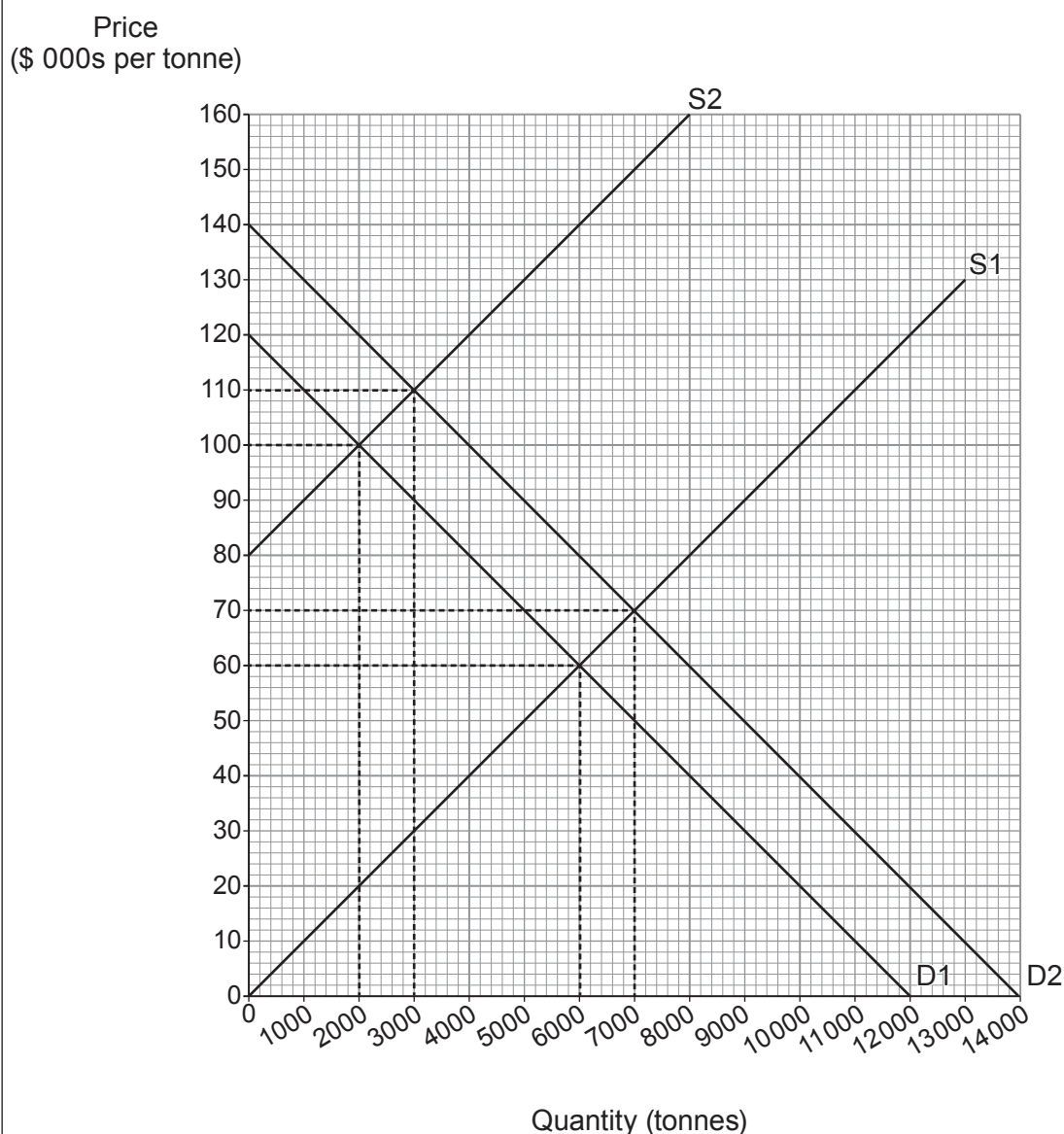


5. Demand for rare-earth minerals continues to rise as they are used in a variety of high-tech goods.

The Chinese Government considered restricting the export of rare-earth minerals, such as neodymium, to the USA in retaliation for USA tariffs on other Chinese exports.

- (a) Using the diagram below, calculate the change in consumer surplus resulting from these two actions. [6]

**The market for neodymium if retaliation occurred
and demand continues to rise**



Consumer surplus (CS) is willingness to pay minus the price paid, the area below D

and above price. Original (D1, S1): $P = \$60\,000$, $Q = 6\,000\text{ t}$, so $CS = \frac{1}{2} \times 6\,000 \times$



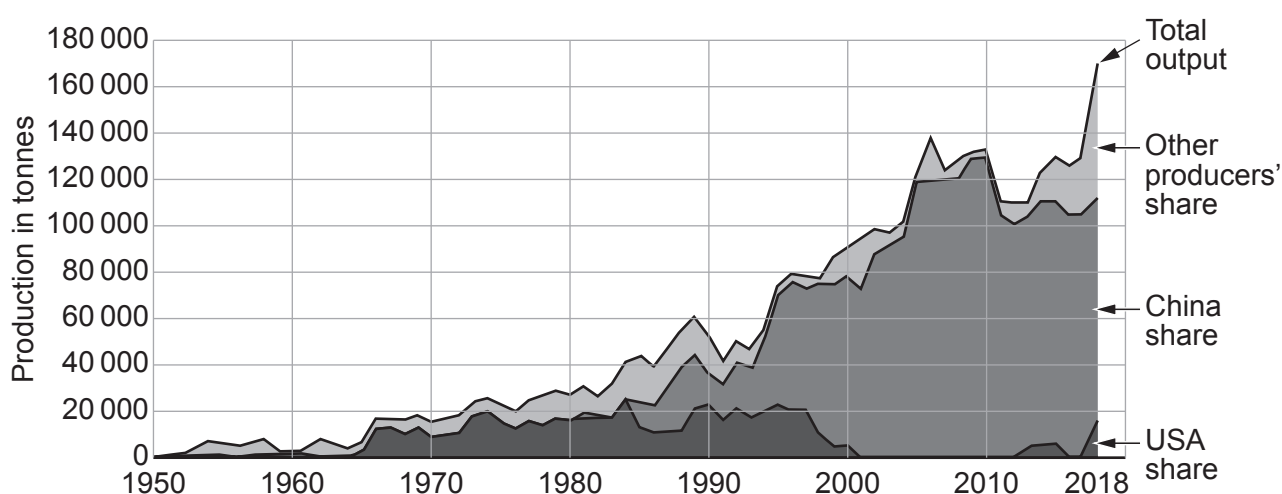
$$(\$120\,000 - \$60\,000) = \$180\,000\,000.$$

$$\text{New } (D_2, S_2): P = \$110\,000, Q = 3\,000\,t, \text{ so } CS = \frac{1}{2} \times 3\,000 \times (\$140\,000 - \$110\,000) = \$45\,000\,000.$$

$$\text{Change in } CS = \$45m - \$180m = -\$135\,000\,000 \text{ (a fall of 75\%).}$$

Mining and processing of rare-earth minerals requires large amounts of energy and emits pollution.

The graph below shows the actual production of rare-earth minerals by country 1950–2018.



Rare-earth minerals are important for many American industries including high-growth sectors such as electric cars, wind turbine production and defence. They are essential in the production of computer memory, rechargeable batteries, touchscreens, LED lighting and much more.

Substitutes can be used, however these are not as effective, particularly in defence applications.

USA sector data 2019:

- Output of environmentally friendly goods and services industries is \$1.3 trillion
- 10% of USA industry output is for the defence industry

Contributions to USA GDP:

Agriculture	Industry	Services
0.9%	18.9%	80.2%

USA GDP total 2019 = \$21.439 trillion



- (b) Using the data, discuss the likely effect on the USA economy of China restricting its exports of rare-earth minerals to the USA.

[9]

Rare-earth minerals are essential inputs for many US industries, and China supplies most of world output (roughly 100 000 of about 170 000 tonnes in 2018), while US production was almost zero from 2000 to 2011. Restricting exports cuts supply to the US (S_1 to S_2) while demand keeps rising (D_1 to D_2), so the price of neodymium rises from \$60 000 to \$110 000 per tonne (+83%) and quantity falls from 6 000 to 3 000 tonnes.

This raises costs of production for firms making electric cars, wind turbines, batteries, touchscreens and defence equipment, causing cost-push inflation: SRAS shifts left, the price level rises and real GDP falls. Dearer US green goods and defence hardware lose price competitiveness, so exports fall and imports rise, worsening the trade deficit and reducing AD, so growth slows and unemployment rises as the derived demand for labour falls. The sectors affected are large: environmentally friendly goods and services output is \$1.3 trillion, about 6.1% of US GDP of \$21.439 trillion, and defence is 10% of industry output, $0.1 \times 18.9\% \times \$21.439\text{tn} \approx \$405\text{bn}$ (about 1.9% of GDP).

However, the effect depends on several factors. Substitutes exist, although they are less effective, especially in defence. Rare earths are a small part of the cost of final goods and defence demand is price inelastic, so the effect on output and jobs may be limited.

The graph shows the US produced over 20 000 tonnes a year in the 1980s and 1990s and has restarted production, to about 15 000 tonnes in 2018, so higher prices make US mining profitable again, although it is energy-intensive and polluting, creating

END OF PAPER



Question number	Additional page, if required. Write the question number(s) in the left-hand margin.
1(c)	<i>Overall, the policies seem moderately effective: they clearly reduce relative inequality, with a growing difference between pre and post intervention ratios, but they are too weak to stop the absolute gap widening, so inequality is still high.</i>
3(b)	<i>security, and there is no data on unemployment or inflation.</i> <i>Overall, the policies have been only partly successful: output in both sectors is at record levels and the deficit has fallen, but growth slowing to about 5% suggests the good days have not fully returned, although it may be too early to judge the long-term supply-side reforms.</i>
4(b)	<i>Overall, local government should provide outdoor gyms, as the equipment is cheap relative to the potential NHS savings and external benefits, but only where usage by inactive adults is likely to be high, so social benefits exceed costs, with use and safety monitored.</i>

Examiner only



Question number	Additional page, if required. Write the question number(s) in the left-hand margin.	Examiner only
5(b)	external costs. US firms could buy from other producers or move production abroad, which lowers US GDP but maintains GNI. Industry is only 18.9% of GDP, while services (80.2%) are largely unaffected, and US government policy could offset the effects. Overall, the restriction is likely to harm the US economy in the short run, especially the high-growth green and defence sectors, through cost-push inflation and lower competitiveness, but the impact on total GDP is likely to be small and temporary as US output and other producers respond.	

