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Economics

Standard level

Paper 2

10 November 2023

Zone A morning | Zone B morning | Zone C morning

1 hour 45 minutes

Instructions to candidates

- Do not open this paper until instructed to do so.
- You are permitted access to a calculator for this paper.
- Unless otherwise stated in the question, all numerical answers must be given exactly or correct to two decimal places.
- You must show all your working.
- Answer one question.
- Use fully labelled diagrams and references to the text/data where appropriate.
- The maximum mark for this examination paper is **[40 marks]**.

Answer **one** question.

1. Read the extracts and answer the questions that follow.

Text A — Overview of Poland

- 1 Poland, a Central European country, has experienced strong economic growth for many years, particularly after 2004, when it joined the European Union (EU). However, there are concerns for its future. Government spending will need to be increased significantly, mainly due to the healthcare and pension costs of an ageing population.
- 2 The ageing population and the growing economy will cause a shortage of workers in the labour market, adding to inflationary pressures. The central bank, National Bank of Poland (NBP), has maintained an inflation target of 2.5 % for several years. Despite this, inflation reached 7.4 % in 2021, higher than the average EU rate of 4.9%. Therefore, in early 2022, the NBP raised its interest rate to 2.75 %.
- 3 The exchange rate for the zloty (Poland’s currency) is a **floating exchange rate**, although the NBP occasionally intervenes in the foreign exchange market. Exports have become more diversified, but they are still mostly low-tech and medium-tech products, which are mainly exported to other European countries.
- 4 Shortages of skilled labour may slow down the implementation of new “greener” technology. Education and training need to be improved to help workers adjust to new technologies in the renewable energy sector and other “green” sectors. The inadequate digital and transport infrastructure, combined with low research and development spending in the private sector, also restricts innovation. Therefore, the adoption of new technologies depends on imports of high-tech capital from countries such as Germany, Japan and the United States (US).
- 5 Over 90 % of Poland’s electricity is produced from fossil fuels (coal, oil and gas), whereas, on average, EU countries rely on fossil fuels to generate only 68 % of their energy. Coal-fired power plants, which generate about 80 % of Poland’s electricity, often do not meet EU regulations on emissions and emit excessive amounts of greenhouse gases and other air pollutants. Therefore, air pollution is a serious problem throughout Poland and the mortality rate due to air pollution is 38 per 100 000 people, compared with the EU average of 20 per 100 000 people.

Text B — Environmental policies

- 1 Measures to reduce greenhouse gas emissions and other pollutants have been introduced. For example, new government programmes and regulations are reducing air pollution from heating. Grants and loans are available for buying non-polluting heaters and installing renewable energy systems. The use of coal in electricity generation is gradually being decreased and the share of renewables is expected to rise to over 20 % within 10 years. Moreover, the first nuclear power plant will be operating by 2033.
- 2 However, the overall level of emissions is rising. Therefore, the World Bank is recommending awareness campaigns, subsidies and increased regulations. More government support for energy efficiency measures (for example, modernizing electricity grids) and renewable energy projects is necessary. Such measures would also act as a fiscal stimulus, due to the required increase in government spending.

(This question continues on the following page)

(Question 1 continued)

- 3 Carbon taxes** are relatively low and not very effective in reducing energy consumption. Exemptions from carbon taxes are given to farmers and low-income households, because they spend proportionately more on fuel. In addition, some subsidies are given for fossil fuel use. High taxes on cars and electricity would raise revenues that could help to finance environmental projects, but they would need to be accompanied by support for those on low incomes.

Text C — Public transport

- 1** As incomes have grown, the number of passengers using public transport has decreased, while the number of cars has increased. Consequently, the amount of emissions per person due to transportation has more than doubled in 20 years. Furthermore, the structure of vehicle taxes in Poland does not encourage the use of hybrid and electric cars, unlike the tax structure in most high-income countries.
- 2** Policies to improve the quality and availability of public transport are needed, because consumers will not respond significantly to lower prices. A single public transport ticket in Poland’s capital city is 4.40 zloty and the price elasticity of demand for urban public transport services is estimated to be only –0.38. Increasing investment in public transport would also promote worker mobility and productivity growth.

Table 1: Economic data for Poland

	2010	2020
Gross domestic product (GDP) per capita (US\$ PPP)	23 996	32 355
Research and development expenditure (% of GDP)	0.7	1.2
Inflation rate (%)	2.58	3.37
Central bank interest rate (%)	3.50	0.10
Unemployment rate (%)	9.64	3.16
Balance of trade in goods and services (US\$ billion)	–10.97	40.42

Table 2: Development data for Poland

	2010	2020
Population (million)	38.04	37.95
Gini coefficient	0.332	0.302*
Human Development Index (HDI)	0.840	0.880
Life expectancy at birth (years)	76.3	78.7
Emissions of carbon dioxide per capita (tonnes)	8.7	9.1
Use of fossil fuels for energy production (% of total energy production)	92.5	90.3

*2018 figure

(This question continues on page 5)

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(Question 1 continued)

- (a) (i) Define the term *floating exchange rate* indicated in bold in the text (**Text A**, paragraph **3**). [2]
- (ii) Define the term *carbon taxes* indicated in bold in the text (**Text B**, paragraph **3**). [2]
- (b) (i) Using information from **Text C**, paragraph **2**, calculate the percentage change in quantity demanded for public transport in Poland’s capital city if the ticket price is reduced from 4.40 zloty to 4.00 zloty. [3]
- (ii) Using information from **Table 1**, calculate Poland’s **real** central bank interest rate in 2020. [2]
- (c) Using an AD/AS diagram, explain why conditions in Poland’s labour market are causing inflationary pressures in the economy (**Text A**, paragraph **2**). [4]
- (d) Using an exchange rate diagram, explain the possible effect of different relative inflation rates in Poland and the EU in 2021 on the exchange rate of the zloty (**Text A**, paragraph **2**). [4]
- (e) Using an AD/AS diagram, explain how the Polish central bank’s monetary policy may affect the inflation rate (**Text A**, paragraph **2**). [4]
- (f) Using a demand and supply diagram, explain how a tax on cars in Poland provides tax revenue (**Text B**, paragraph **3**). [4]
- (g) Using information from the texts/data and your knowledge of economics, discuss whether there is a conflict between economic growth and environmental sustainability in Poland. [15]

2. Read the extracts and answer the questions that follow.

Text D — Overview of Senegal and its natural resources

- 1 Senegal is a country in West Africa with a stable democracy. Its main industries are extraction of minerals and fuels, construction, fishing and tourism. About 25 % of exports are minerals and fuels.
- 2 In 2019, large oil and gas deposits were discovered offshore. Imports of machinery needed for extraction caused an increase in the current account deficit. From 2022, after oil and gas production starts, exports are expected to increase. However, profits and interest payments will have to be paid overseas to lenders and firms which invested in the oil and gas industry.
- 3 Although minerals and fuels represent a large part of gross domestic product (GDP), they do not provide much employment. Furthermore, these industries contribute only about 5 % of government tax revenue. The low tax collection is due to tax concessions granted to the multinational companies (MNCs) which do the extraction. These MNCs are needed because, at present, neither the government nor local companies have the technology and expertise to extract the minerals and fuels.
- 4 Senegal is not self-sufficient in food. A large amount of rice is imported because domestic rice is usually more expensive than imported rice. The government is trying to promote agriculture and, in 2015, imposed a tariff of 10 % on rice imports.
- 5 Sustainable management of **common pool resources** (common access resources), such as forests and fisheries, is difficult. The water supply (from rivers and underground) is a common pool resource, which is often used unsustainably by farmers to irrigate their rice fields. This results in a negative externality, namely depletion of the water supply, which causes problems for villagers who need water.

Text E — Poverty and inequality in Senegal

- 1 According to the **Multidimensional Poverty Index (MPI)**, 28 % of Senegalese are deprived in over half the indicators (such as nutrition and sanitation) and are considered to be living in severe poverty. Over 50 % of Senegalese are deprived in more than a third of the indicators.
- 2 During the last 10 years, poverty has been reduced and unemployment has fallen. However, inequality between urban and rural areas persists. The minimum hourly wage in the non-agricultural sector is 317 West African CFA francs (Senegal's currency), which is almost 50 % higher than that for the agricultural sector. Despite increases in agricultural productivity, farmers are still vulnerable to weather shocks such as drought and floods. Many regions are in a poverty trap because households cannot invest much in physical capital or human capital.
- 3 School attendance is free and compulsory for children up to 16 years old, but there are hidden costs, such as expenditure on school materials and transport, and opportunity costs. Consequently, while primary school enrolment is over 80 %, secondary school enrolment is less than 40 %.
- 4 Moreover, there is significant gender inequality. The completion rate for girls in secondary education is lower than for boys. Secondary education is particularly important for girls because it provides skills for the job market, leading to higher future earnings. Moreover, girls with more education have lower fertility rates.

(This question continues on the following page)

(Question 2 continued)

Text F — Taxation policies in Senegal

- 1** The total tax revenue is equal to 15 % of GDP in Senegal, whereas it often exceeds 20 % of GDP in similar economies. Therefore, in a study on Senegal, the International Monetary Fund (IMF) recommends increased taxes, under certain conditions. Firstly, the rise should be equitable and the taxation structure should be effective. Secondly, the extra revenue should be used for more spending on infrastructure, health and education and for transfer payments, which can increase growth. For example, cash transfers of just US\$200 each to Senegalese farmers also raised output, because the money was used to buy fertilizers.

- 2** However, increases in certain taxes can reduce output and increase inequality. Senegal’s tax revenue mainly comes from indirect taxes and corporate income taxes, because it is difficult to collect personal income taxes in the large informal economy. The IMF study shows that an increase in indirect tax has the lowest negative effect on growth but widens inequality, especially between rural and urban areas. In contrast, an increase in corporate income tax would narrow the urban–rural income gap and would not reduce incentives or output significantly.

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(Question 2 continued)

Table 3: Economic data for Senegal

	2010	2020
GDP per capita (US\$ PPP)	2797	3320
Nominal GDP (US\$ billion)	17.81	24.64
Price deflator (base year = 2014)	93.56	106.11
Unemployment rate (%)	10.34	7.10
Balance of trade in goods (US\$ billion)	–1.92	–3.60

Table 4: Development data for Senegal

	2010	2019
Population (million)	12.68	16.30
Urban areas: % of population below the national poverty line*	22.5	19.8
Rural areas: % of population below the national poverty line*	59.0	54.0
Secondary school completion rate, male (% of age group)	33	34
Secondary school completion rate, female (% of age group)	41	28
Gini coefficient	0.403	0.350
Human Development Index (HDI)	0.468	0.512

*national poverty line: the minimum acceptable living standard based on consumption needs

Table 5: Selected balance of payments items for Senegal in 2018

	US\$ million
Exports of goods and services	5077
Imports of goods and services	8747
Income receipts/inflows	444
Income payments/outflows	1045
Current transfers (net)	2059

(This question continues on the following page)

(Question 2 continued)

- (a) (i) Define the term *common pool resources* indicated in bold in the text (**Text D**, paragraph **5**). [2]
 - (ii) Define the term *Multidimensional Poverty Index (MPI)* indicated in bold in the text (**Text E**, paragraph **1**). [2]
 - (b) (i) Using information from **Table 3**, calculate Senegal’s **real** GDP (in US\$) in 2020. [2]
 - (ii) Using information from **Table 5**, calculate Senegal’s current account balance (in US\$) in 2018. [2]
 - (iii) Using information from **Table 5**, identify whether Senegal’s balance of trade in goods and services is a surplus or a deficit. [1]
 - (c) Using a production possibilities curve (PPC) diagram, explain how the discovery of oil affected production possibilities in Senegal (**Text D**, paragraph **2**). [4]
 - (d) Using an exchange rate diagram, explain how the change in the balance of trade in goods between 2010 and 2020 may have changed the exchange rate of the West African CFA franc (**Table 3**). [4]
 - (e) Using an international trade diagram, explain the likely effect on domestic producer surplus in Senegal of the tariff on rice imports (**Text D**, paragraph **4**). [4]
 - (f) Using an externalities diagram, explain why the use of water by rice farmers may result in market failure in the rice market in Senegal (**Text D**, paragraph **5**). [4]
 - (g) Using information from the texts/data and your knowledge of economics, evaluate policies that could be used to reduce inequality in Senegal. [15]
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References:**Text A**

OECD, 2021. *Economic Forecast Summary* [online] Available at: <https://www.oecd.org/economy/poland-economic-snapshot/> [Accessed 30 September 2022]. Source adapted.

Narodowy Bank Polski, n.d. *Monetary Policy Guidelines for 2020* [pdf] NBP. Available at: https://www.nbp.pl/en/publikacje/o_polityce_pienieznej/zal2020a.pdf [Accessed 30 September 2022]. Source adapted.

US International Trade Administration, September 2021. *Poland - Country Commercial Guide: Environmental Technologies* [online] Available at: <https://www.trade.gov/country-commercial-guides/poland-environmental-technologies> [Accessed 30 September 2022]. Source adapted.

Eurostat Euroindicators, 2021. *Flash Estimate –November 2021*, [pdf] Eurostat. Available at: <https://ec.europa.eu/eurostat/documents/2995521/11563387/2-30112021-AP-EN.pdf/8072b1c7-4379-7f8e-af36-ec2300c42265> [Accessed 30 September 2022]. Source adapted.

- Text B** World Bank, 2019. *“Air quality management — Poland”*, [pdf] World Bank. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/31531/Air-Quality-Management-in-Poland.pdf> [Accessed 30 September 2022]. Source adapted.
- Text C** Swianiewicz, P., Brzoska, A., *Transylvanian Review of Administrative Sciences*, 2018. *Demand Elasticity for Local Public Transport in Polish Cities: Do Local Policies Matter?* [online] Available at: <https://rtsa.ro/tras/index.php/tras/article/view/640> [Accessed 30 September 2022]. Source adapted.
- Table 1** The World Bank, n.d. [online] Available at: <https://data.worldbank.org/> [Accessed 30 September 2022]. Source adapted.
- Narodowy Bank Polski, n.d. Interest rates [online] Available at: <https://www.nbp.pl/homen.aspx?f=en/dzienne/stopy.htm> [Accessed 30 September 2022]. Source adapted.
- Table 2** The World Bank, n.d. [online] Available at: <https://data.worldbank.org/> [Accessed 30 September 2022]. Source adapted.
- United Nations Development Programme, n.d. *Poland* [online] Available at: <http://hdr.undp.org/en/countries/profiles/POL> [Accessed 30 September 2022]. Source adapted.
- United Nations Development Programme, n.d. *Human Development Data* [online] Available at: <https://hdr.undp.org/en/data> [Accessed 30 September 2022]. Source adapted.
- Text D** World Bank, 2021, *Poverty and Equity Brief: Senegal*, [pdf] World Bank. Available at: https://databank.worldbank.org/data/download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/AM2021/Global_POVEQ_SEN.pdf [Accessed 30 September 2022]. Source adapted.
- Kane, E.H., 2019, *Oil Wealth in Senegal: For the Many or the Few?* [online] Available at: <https://inequality.org/research/oil-wealth-senegal/> [Accessed 30 September 2022]. Source adapted.
- Hanatani, A., 2016, *Exploring User Incentive Mechanisms for Sustainable Water Infrastructure Management - An Institutional Analysis of Rural Water Supply Systems in Senegal*, [pdf] Forum of International Development Studies. Available at: <https://www.gsid.nagoya-u.ac.jp/bpub/research/public/forum/47/02.pdf> [Accessed 30 September 2022]. Source adapted.
- Text E** Oxford Poverty and Human Development, 2021. *“Senegal Country Briefing”*, [pdf] University of Oxford. Available at: https://ophi.org.uk/wp-content/uploads/CB_SEN_2021.pdf [Accessed 30 September 2022]. Source adapted.
- Lano, C., 2017. *Ten facts about the Senegal Poverty Rate*, [online] Available at: <https://borgenproject.org/senegal-poverty-rate/#:~:text=In%20rural%20areas%2C%2066%20percent,%241.90%20or%20less%20a%20day> [Accessed 30 September 2022]. Source adapted.
- Malta, V., Tavares, M.M., 2019, *Gender Gaps in Senegal: From Education to Labor Market* [online] Available at: <https://www.elibrary.imf.org/view/journals/002/2019/028/article-A002-en.xml> [Accessed 30 September 2022]. Source adapted.
- Wage Indicator Foundation, n.d. *Minimum Wage - Senegal* [online] Available at: <https://wageindicator.org/salary/minimum-wage/senegal> [Accessed 30 September 2022]. Source adapted.
- Text F** Tang, X., Yehoue, E., 2019, *Revenue Mobilization and Inequality in Senegal* [online] Available at: <https://www.elibrary.imf.org/view/journals/002/2019/028/article-A003-en.xml?result=8&rskey=VuJj9k> [Accessed 30 September 2022]. Source adapted.
- Table 3** The World Bank, n.d. [online] Available at: <https://data.worldbank.org/> [Accessed 30 September 2022]. Source adapted.
- Table 4** World Bank, 2021, *Poverty and Equity Brief: Senegal*, [pdf] World Bank. Available at: https://databank.worldbank.org/data/download/poverty/987B9C90-CB9F-4D93-AE8C-750588BF00QA/AM2021/Global_POVEQ_SEN.pdf [Accessed 30 September 2022]. Source adapted.
- United Nations Development Programme, n.d. *Human Development Insights* [online] Available at: <http://hdr.undp.org/en/countries/profiles/SEN> [Accessed 30 September 2022]. Source adapted.
- Table 5** The World Bank, n.d. [online] Available at: <https://data.worldbank.org/> [Accessed 30 September 2022]. Source adapted.