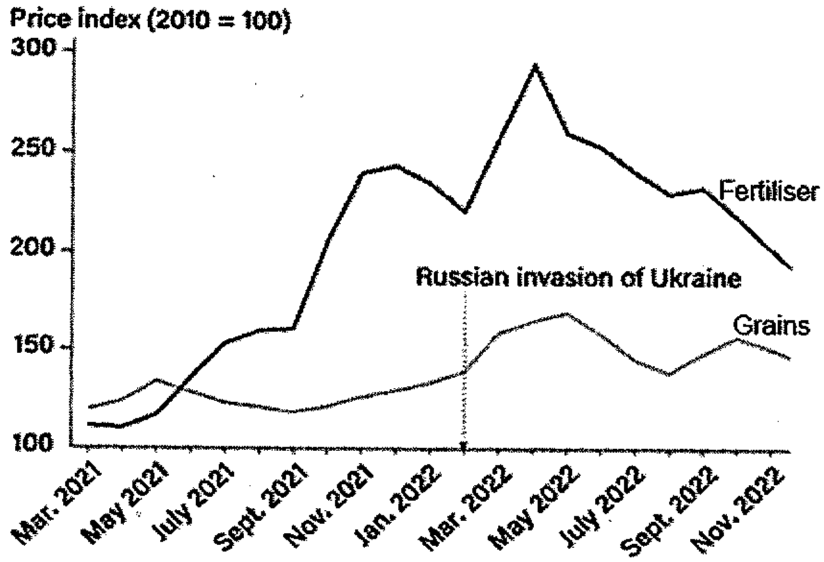
***Adapted from 2024 NYJC Prelims Paper 1***

**Question 1: Impact of Russia-Ukraine War on Various Industries**

**Extract 1: Effects of war on the fertiliser industry**

The effects of the Russia-Ukraine war may reverberate through the global fertiliser industry for years to come. Post-COVID supply-chain disruptions had already pushed fertiliser prices to cyclical highs in 2021. Russia's invasion of Ukraine in February, and the sanctions and trade supply disruptions that followed then pushed prices even higher, grain prices also increased, reaching a peak in May 2022. Russia is a major producer of the three main types of fertilisers - nitrogen, phosphate, and potash (NPK), and a major exporter of key raw materials for fertiliser production elsewhere in the world. High fertiliser prices have boosted earnings and profitability of the 12 global fertiliser companies rated by S&P Global Ratings. This is boosting fertiliser companies' profits and credit quality for now. But this has also destroyed demand from farmers who are unable to afford fertilisers and, in turn, increased food insecurity worldwide. It also highlights the need to reduce dependence on Russia, the world's largest fertiliser exporter. Yet, investment required to end dependence on Russian and Belarussian fertilisers is being hampered by high inflation, supply shortages, and in the case of nitrogen fertilisers, uncertainties over the shape of further regulation to decarbonize the industry.

**Figure 1: Comparison between fertiliser and grains prices from 2021 to 2022**




*Adapted from USDA, Economic Research Service Department of Agriculture, 2022 and World Bank, 2022*

**Extract 2: Pollution generated from the use of fertilisers**

Farmers apply nutrients on their fields in the form of chemical fertilisers and animal manure, which provide crops with the nitrogen and phosphorus necessary to grow and produce the food we eat. However, when nitrogen and phosphorus are not fully utilised by the growing plants, they can be lost from the farm fields and negatively impact air and downstream water quality.

This excess nitrogen and phosphorus can be washed from farm fields and into waterways during rain events and when snow melts and can also leach through the soil and into groundwater over time. High levels of nitrogen and phosphorus can cause eutrophication of water bodies. Eutrophication can lead to hypoxia ("dead zones"), causing fish kills and a decrease in aquatic life.

Excess nutrients can cause harmful algal blooms (HABs) in freshwater systems, which not only disrupt wildlife but can also produce toxins harmful to humans.

Fertilized soils, as well as livestock operations, are also vulnerable to nutrient losses to the air. Nitrogen can be lost from farm fields in the form of gaseous, nitrogen-based compounds, like ammonia and nitrogen oxides. Ammonia can be harmful to aquatic life if large amounts are deposited from the atmosphere to surface waters. Nitrous oxide is a potent greenhouse gas.

There are many ways that farmers can reduce nutrient losses from their operations, including, but not limited to Adopting Nutrient Management Techniques: Farmers can improve nutrient management practices by applying nutrients (fertiliser and manure) in the right amount, at the right time of year, with the right method and with the right placement. This would likely increase their operating cost of production but would hopefully reduce the negative impacts on others.

*Source: Environmental Protection Agency, 2022*

**Extract 3: Rethinking the use of nitrogen fertiliser**

Governments can start by promoting more responsible and efficient uses for nitrogen fertilisers. In this regard, they might consider promoting the principles enshrined in the International Code of Conduct for the Sustainable Use and Management of Fertilisers. This Fertiliser Code was designed to support the implementation of the Voluntary Guidelines for Sustainable Soil Management produced by the Global Soil Partnership to promote practices to reduce the overuse and misuse of fertilisers. The Fertiliser Code includes recommendations for government regulations related to the sale, distribution, and labelling of fertiliser products.

Second, governments can promote greater use of organic fertilisers such as manure, compost, peat, seaweed, or guano, where conditions permit. These fertilisers do have their limitations: they are often more expensive, slower in releasing nutrients, often limited to moist and warmer soils, and insufficient to meet the food demands of a growing world population. Yet they can still offer an additional tool to improve soil structure in an environmentally friendly way until there are more effective solutions available.

These options, while useful in the short term, do not offer a satisfactory alternative to our long-standing reliance on nitrogen fertilisers, especially when considering current projections of population growth through 2050. What other options do governments have to reduce reliance on nitrogen fertilisers in the medium to long term?

There are promising scientific developments underway for alternative fertilisers, but many of these approaches need further development. For example, scientists are working to perfect a process known as "biological nitrogen fixation", where legumes such as peas, beans, or lentils, by using a particular type of soil bacteria called rhizobia, "reduce" or "fix" nitrogen from the atmosphere into a form that crops can use as a fertiliser. If further developed, scientific experts say this could be a viable alternative to nitrogen fertilisers that rely on natural gas.

However, research and development on fertilisers based on biological nitrogen fixation are still at a very early stage.

Government support that currently goes to chemical fertilisers could go instead to supporting further research and development of alternative fertilisers, including this one. Not only would repurposing farm subsidies in this way help the environment by reducing nitrogen pollution and supporting cleaner marine and freshwater ecosystems, but it would help secure greater crop yields for farmers, with related benefits for global food security. This government support for research and development to fertiliser alternatives could also be matched by private investment.
Under any scenario, both public and private efforts would be essential for rethinking the use of nitrogen fertilisers in agriculture to ensure sufficient, safe, and nutritious food for everyone with

minimal environmental harm. As the current crisis has reminded us, we need to start making changes now both to address our current hunger and food security challenges while also ensuring we are better able to withstand other shocks in the future.

*Source: International Institute for Sustainable Development, 24 March 2022*

**Extract 4: European industry braced for pain from latest surge in oil and gas prices**

The latest surge in oil and gas prices as the west responds to Russia's invasion of Ukraine is threatening a sharp rise in costs for European industry, severely hurting sectors from steel and aluminium to fertilisers and transport. That means yet more pain for airlines, shipping companies, carmakers and other energy-intensive industries, which had already called on governments to address "unbearably high energy prices" before the current crisis.

**Airline Companies**
Higher oil prices sent shares in airline groups lower on Monday, with a more than 7 per cent fall at Ryanair taking monthly losses to 30 per cent. Higher crude prices feed through to jet fuel used to power the giant machines of global transport. Jet fuel has more than doubled in a year to the highest level since 2008 at $1,166 per metric tonne, according to S&P Global Commodity Insights. "The high fuel cost and higher inflation is here to stay longer," said Rico Luman, a senior economist specialising in transport at ING. Although fuel accounts for roughly 50 per cent of shipping companies' costs versus 20 to 35 per cent for aviation, analysts said airline companies were more exposed to the rise in fuel costs as the industry recovers from the pandemic because of consumer sensitivity to higher ticket prices. While countries have experienced a decline in tourism in the last two years due to the Covid-19 pandemic have not yet recovered, the conflict between Ukraine and Russia has negatively affected the tourism sector globally. Sathish Sathish Sivakumar, analyst at Citigroup, said legacy carriers could more easily introduce emergency fuel surcharges compared with the low-cost carriers that would have to increase ticket prices.

**Carmakers**
For Europe's car plants already battling rising parts bills and stuttering supply chains, a further steep rise in energy costs is the latest in a long line of hammer blows to competitiveness. After labour and raw materials, energy costs are the largest bill that vehicle manufacturers face, even though Europe's auto plants have reduced their energy use by 28 per cent since 2005. Executives at Mercedes-Benz, Stellantis and Renault have all recently warned of rising costs from higher raw material prices. As well as the electricity used in running their own factories, carmakers will also be hit by rising production costs among suppliers making everything from steel and aluminium to plastics and glass. "Metals, chemicals, plastics and glass rely a lot on gas for processing," said Dominic Tribe, a supply chain analyst at Vendigital. He added that roughly half of the industrial energy use was based on gas, while a fifth was from electricity, which is also rising. "The list is long because so many manufacturing processes in automotive are heat-based," said Philippe Houchois, analyst at Jefferies. The cost implications are material. Tribe estimated that overall costs for vehicle manufacturers could rise by as much as a fifth in the coming months, denting carmakers' margins, which for most are about 10 per cent when things run well. Bills for carmakers are unlikely to rise immediately because many plants buy energy in advance, generally a quarter at a time. The gas rates are therefore unlikely to feed through into higher prices until next month, although they will also take longer to fall once the global price comes down. Growing concerns about the automotive supply chain, a potential energy crisis and consumer confidence crash are feeding fears about the impact of the Ukraine-Russia war on car retail.

*Adapted from Financial Times, 8 March 2022, Journal of Aviation, May 2022 and AM Online, 4 April 2022*

**Questions**

**(a)** Identify and explain the similarity between the price of fertiliser and grain from February to April 2022. [2]

**(b)** Using a relevant price elasticity concept, explain the impact of the Russia-Ukraine war on Russia's fertiliser export revenue. [4]

**(c)** 'But this has also destroyed demand from farmers who are unable to afford fertilisers and, in turn, increased food insecurity worldwide.' (Extract 1)

From the above statement, explain one microeconomic objective that is not achieved. [2]

**(d)** **(i)** With the aid of a diagram, explain the source of market failure in the fertiliser market as mentioned in Extract 2. [4]

**(ii)** Discuss the various policies a government could undertake to achieve efficient allocation of resources in the fertiliser market. [8]

**(e)** With reference to Extract 4, discuss whether energy cost is the main factor affecting the profitability of firms due to Russia's invasion of Ukraine. [10]

**[Total: 30]**

## Question 2: Opportunities and Challenges in the Post-Covid World

### Extract 5: Supply chain disruptions cost Singapore $2.6 billion annually

Supply chain disruptions are setting Singapore's economy back by $2.6 billion per year, according to business transformation consultancy TMX Global, and undermining the profitability of businesses.

As such, the Singapore government has rolled out initiatives aimed at building more resilient supply chains. This includes an $18 million Supply Chain 4.0 Initiative to integrate digital and automated solutions to help businesses anticipate scenarios in the event of disruptions to their supply chains. The Singapore Trade Data Exchange (SGTraDex) has also been launched to facilitate the secure sharing of information between the supply chain ecosystem participants via a common data corridor.

However, TMX Global's Country Manager of Malaysia and Singapore, Greg O'Shea states that technology is not a cure-all. Businesses also need to optimise and transform their operations to enable business agility as well as upskill their workforce to serve a reinvented supply chain.

*Adapted from The Edge Singapore, 16 February 2023*

**Table 1: United Kingdom, Selected Economic Indicators (Quarterly Data)**

| | 2021 | | | | 2022 | | | | 2023 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| **GDP growth (%)** | -1.0 | 7.3 | 1.7 | 1.5 | 0.5 | 0.1 | -0.1 | 0.1 | 0.2 | 0 | -0.1 | -0.3 |
| **Inflation rate (%)** | 0.9 | 2.1 | 2.7 | 4.4 | 5.5 | 7.9 | 8.7 | 9.4 | 9.0 | 7.7 | 6.3 | 4.4 |

*Source: Trading Economics and UK Office for National Statistics*

### Extract 6: UK prices soar at fastest rate for almost ten years

Inflationary pressures, coupled with the uneven pace of economic recovery from the Covid-19 pandemic has led to concerns over stagflation, which refers to an economy characterised by high inflation and low economic growth.

Inflation soared in 2022 because oil and gas were in greater demand after the Covid pandemic. Energy prices surged again when Russia invaded Ukraine, cutting global supplies.

Government support to businesses during the pandemic – like reduced VAT for hospitality – has ended. In addition, businesses are struggling to recruit lorry drivers and hospitality staff, and so are having to put up wages (costs that get passed on to consumers). This is partly due to the pandemic, but is also compounded by Brexit, according to international policy forum the OECD.

Inflation had remained above the Bank of England's 2% target partly because of high energy and food prices. Food prices are still 25% higher than at the beginning of 2022, and petrol prices are increasing again.

*Source: BBC, 17 November 2021 and 20 June 2024*

**Extract 7: Is the Bank of England done hiking?**

The Bank of England (BoE) uses interest rates to try and keep inflation at 2%.

When inflation was well above that target, it increased interest rates for 14 successive rounds from 0.25% in January 2022 to 5.25% in August 2023 and has held it steady since.

Britain's economy is already under strain from the run-up of interest rates between December 2021 and August this year, with about half of the impact of those rate hikes yet to be felt. Warning against complacency, Governor Andrew Bailey said inflation was still too high and that the BoE was determined to get it all the way back to its 2% target.

Bailey acknowledged that the conflict in the Middle East created a risk of higher energy prices that could feed through into inflation but said that had not happened so far.

Although inflation has fallen from 11.1% - its highest since the 1980s - just over a year ago to 6.7% in the most recent data, it remains more than three times the BoE's 2% target. The central bank said it expected no growth in Britain's economy in July-September, before expansion of just 0.1% in the fourth quarter. It forecast zero growth in 2024 and an expansion of just 0.25% in 2025.

The BoE is now facing the dilemma of whether to keep interest rates on hold, or to lower them.

Although the headline CPI figure has hit the 2% target in June 2024, the Bank also considers other measures of inflation when deciding how to change rates, such as "core inflation". Core inflation doesn't include food or energy prices because they tend to be very volatile, but it was 3.5% in May, which suggests price rises are still an issue.

The BoE is keeping a close eye on strong wage growth, however, which it fears could keep price pressures simmering.

*Adapted from various sources*

**Extract 8: RCEP, a catalyst for recovery, regional integration in Asia-Pacific**

The Regional Comprehensive Economic Partnership (RCEP) Agreement was inked in November 2020 by the 10 ASEAN countries as well as China, Australia, New Zealand, Japan and South Korea. It is by far the largest plurilateral free trade agreement in the world, covering nearly one third of the world's population, one third of the global GDP, and one third of the world's total exports. The bloc is also the fastest growing and most promising investment region in the world.

As the world grapples with the COVID-19 pandemic and multiple uncertainties, the implementation of the RCEP trade pact offers a timely boost to faster recovery and long-term growth and prosperity of the region.

It aims to ultimately eliminate tariffs on over 90 percent of goods trading among its signatories over the next 20 years, open up trade in goods and services, and promote investment to help emerging economies catch up with the rest of the world.

The pact will also give participating countries preferential access into growing markets in the region and reduce costs and time for companies by allowing them to export products anywhere within the bloc without meeting separate requirements for each country.

According to an Asian Development Bank study, the RCEP will increase the member economies' incomes by 0.6 percent by 2030, adding 245 billion dollars annually to regional income and 2.8 million jobs to regional employment.

*Adapted from Xinhua, 3 January 2023*

**Extract 9: The limits of the RCEP**

Expanded trade can create jobs and improve peoples' lives. However, governments have often been reluctant to admit that all trade deals have both winners and losers because they reduce tariffs and other trade barriers, intensify competition, and result in job losses in some industries. In fact, India left the deal due to concerns about larger trade deficits with China and the inability to protect its local industries.

The RCEP also lacks rules to protect the environment and workers, and the tariff reductions it demands are not as large as the ones required by the other big Asia-Pacific trade agreement, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, which includes seven RCEP members. As a result, it may not bring major economic benefits, even for participating countries.

*Source: Australian Institute of International Affairs, 27 November 2020 and Project Syndicate, 4 December 2020*

**Questions**

**(a)** Explain how supply chain disruptions may be "undermining the profitability of businesses" (Extract 5). [2]

**(b)** Using Extract 5, explain the different effects of the Singapore government's initiatives to build more resilient supply chains on its employment levels. [4]

**(c)** **(i)** Explain how Table 1 can be used to show evidence of stagflation in the UK economy from 2021 to 2022. [1]

**(ii)** With reference to Extract 6 and using a diagram, explain how stagflation might have occurred in the UK economy. [5]

**(d)** 'The BoE is now facing the dilemma of whether to keep interest rates on hold, or to lower them.' (Extract 7)

In light of the challenges faced, discuss the factors that the Bank of England should consider in deciding whether to change its interest rates. [8]

**(e)** Assess whether the Regional Comprehensive Economic Partnership (RCEP) would likely be of overall benefit to the Asian economies. [10]

**[Total: 30]**