RAFFLES INSTITUTION
2022 YEAR 5 PROMOTION EXAMINATION
Higher 2

ECONOMICS 9570/01

Paper 1 Case Study

21 September 2022

1 hour 15 minutes

Additional Materials: Answer Paper

READ THESE INSTRUCTIONS FIRST

Write your name, index number and civics class on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a soft pencil for diagrams, graphs or rough working.
Do not use paper clips, highlighters, glue or correction fluid.

Answer **all questions**.

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

Attach this cover sheet to answers for Paper 1.

Name: _____

Civics Class: _____

Economics Tutor: _____

Question	Marks
1	/30

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Question 1 The Pharmaceutical Industry

Figure 1: US Pharmaceutical Industry Revenue (2010-2020)

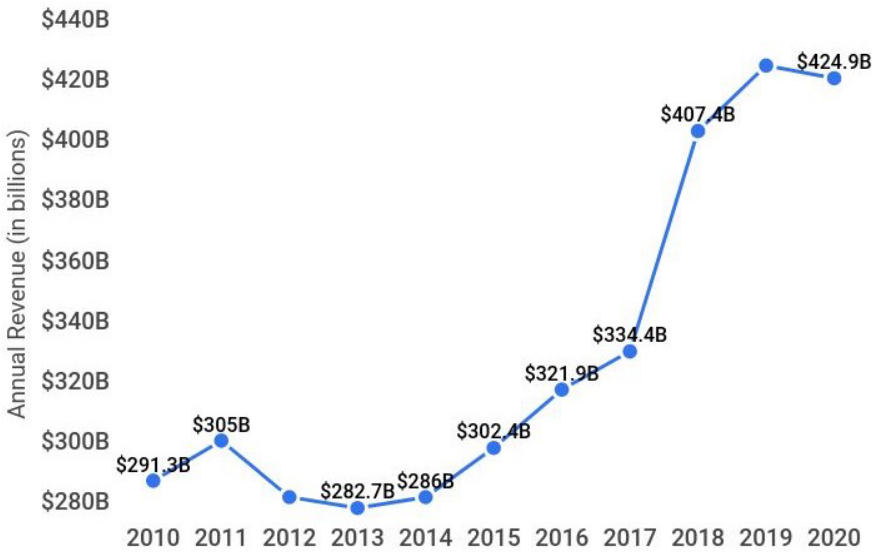

Table 1: Top Pharmaceutical Companies Globally by Revenue and R&D spending (2021)

Company	Revenue (billions, USD)	R&D spending (millions, USD)
Pfizer	81.3	13.8
Roche	68.1	13.3
AbbVie	56.1	7.08
Johnson & Johnson	52.1	11.9
Novartis	51.6	9.54
Merck	48.7	12.2

Source: Various

Extract 1: The Risk in Suspending Patent Rules

South Africa and India have petitioned the World Trade Organisation to suspend some intellectual property protections for Covid-19 drugs, vaccines and diagnostic technologies. In support of the effort, Doctors Without Borders began a social media campaign urging governments to "put lives over profits", warning of "pharma profiteering" and urging support for "#NoCovidMonopolies".

If successful, the effort would jeopardise future medical innovation, making us more vulnerable to other diseases. Intellectual property rights, including patents, grant inventors a period of exclusivity to make and market their creations. By affording these rights to those who create intangible assets, such as musical compositions, software or drug formulas - people will invent more useful new things.

Development of a new medicine is risky and costly. Consider that scientists have spent decades - and billions of dollars - working on Alzheimer's treatments, but still have little to show for it. The companies and investors who fund research shoulder so much risk because they have a shot at a reward. Once a patent expires, generic companies are free to produce

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the same product. The prices of generic drugs are much lower than the prices of patented drugs – it has been suggested that for widely-used drugs, price falls can be as much as 95%.

Moreover, the current situation is not a parallel to traditional abuse of monopoly power. Several major drug companies - including AstraZeneca, GlaxoSmithKline and Johnson & Johnson - have already pledged to offer their vaccines on a not-for-profit basis during the pandemic. Others are considering differential pricing for different countries. Pfizer and BioNTech are using tiered pricing to supply their vaccine. Under the system, wealthier countries pay "about the cost of a takeaway meal for each dose," while middle-income countries pay roughly half that price.

Source: The New York Times, 10 December 2020

Extract 2: How to Think About Vaccines and Patents

Problems arise in the pharmaceutical sector because the ideal economic market seldom exists in healthcare, which can skew rewards for, and therefore investments in, innovation. The pharmaceutical sector can potentially abuse market power for necessary medicines. Unlike consumers of ordinary goods, patients with medical needs may not be in a position to defer consumption until prices fall.

Policies that extend intellectual property rights and limit price controls work against universal health and access to necessary medicines. As such, governments need to develop their capacities to redress such failings. As a case in point, Turing Pharmaceuticals raised the price of Daraprim[1] by 5,500%, illustrating how the absence of competition can lead to price gouging. And Gilead's decision to sell Sovaldi[2] for $84,000 per course of treatment raised the question whether society must accept any price set by the patent holder.

Studies routinely find little or no evidence that strengthening intellectual property protections boosts subsequent innovation, argue Michele Boldrin and David Levine of Washington University. Pharmaceuticals, where intellectual property rights are often assumed to be essential, are no exception. Patents award rich profits to firms even though private investment accounts for only about a third of spending on American biomedical research. A check on the 2019 financial reports of five of the industry's biggest names showed that these companies spent more on marketing and sales than they did on research and development. Additionally, every company's spending on research and development has increased only marginally year on year.

Source: Various

Extract 3: It was the Government that Produced Covid-19 Vaccine Success

Government support for research and development (R&D) is critical, especially when it comes to vaccines. R&D entails significant externalities that are difficult to capture by the private innovator. The gap, sometimes considerable, between social and private rates of return to inventions results in significant underinvestment in R&D.

And the intervention may also address deficiencies in how drugmakers have handled the vaccine effort. Firms have been reluctant to share cell lines, data and tacit know-how with producers that could one day pose a competitive threat, slowing the creation of new, and life-saving, production capacity.

[1] Daraprim is used to treat parasite infection
[2] Sovaldi is used to treat infection caused by Hepatitis C virus

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The massive injections of research money by governments have contributed to eliminating such market failures. The United States and Germany have been the largest investors in Covid-19 vaccine R&D, pouring approximately $2 billion and $1.5 billion into the effort respectively. Notably, out of $5.9 billion in investment tracked up to March 2021, 98.12% was public funding. The money primarily went to private companies with both Moderna and Janssen receiving more than $900 million. Pfizer and BioNTech, who developed the first Covid-19 vaccine authorised in the United States, received some $800 million in R&D funding. Practically all of the money invested in the three companies came from public funding.

Source: Various

Extract 4: Cost Control - Drug Pricing Policies Around the World

Providing universal access to modern medical innovations has been no easy feat, anywhere in the world. Even in the wealthiest countries, striking a balance between rewarding innovative drug developers and catering to the needs of budget-strained health systems is an ongoing discussion, whether strict government-level price control is in place, like in the UK, or a more free-market system is being followed, as in the US.

Just as the US is well-known for its hands-off, free-market approach to drug price policy, India is famed for its hardline stance on regulating drug prices and encouraging generic competition. Strict price controls and a permissive attitude to the development of generic versions of branded drugs for the domestic market – sometimes within a product's patent period – has alienated 'big pharma' and international trade partners to some extent, as well as transforming India's generics industry into one of the world's leading providers of low-cost medicines.

India's stance is understandable, given that the majority of prescription drug costs in the country are paid out-of-pocket, leaving many trapped in poverty by the weight of medical costs. Still, the Modi government is treading a tightrope as it pursues its goal of access to affordable drugs while promoting its 'ease of doing business' policy.

Source: Pharmaceutical Technology, 12 February 2018

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Questions:

(a) With reference to Figure 1,

(i) describe the trend in the revenue of the US pharmaceutical industry from 2014 to 2019. [2]

(ii) explain one possible reason why the decrease in revenue of the US pharmaceutical industry is expected to continue beyond 2020. [2]

(b) With the aid of a diagram, explain whether an increase in a firm's research and development spending will always increase its profits. [5]

(c) 'Wealthier countries pay "about the cost of a takeaway meal for each dose," while middle-income countries pay roughly half that price'.

Explain why this is a form of price discrimination. [3]

(d) To what extent is government intervention necessary in research and development in the pharmaceutical industry? [8]

(e) To reduce the adverse effects of market dominance, some countries have proposed the removal of patents, while others have implemented pricing regulation.

Discuss whether the removal of patents for pharmaceutical firms is more beneficial than pricing regulation in improving outcomes for consumers. [10]

[30 marks]