

## REVIEW QUESTIONS

- 1. Explain the difference between material technology and social technology. Why is it important to make the distinction between 'sustaining' and 'disruptive' technologies?**

Material technology can be 'seen, heard and touched'. Students should give examples to illustrate. Social technology relates to human intervention and practices that attempt to order the behaviour of employees and govern how work is completed. Social technology 'nudges' people to change their behaviour (Thaler and Sunstein 2009). Sustaining technologies have in common that they improve the efficiency of established processes or products. Disruptive technologies create new product and labour markets and that are cheaper, simpler, and smaller and have the potential to transform how and where production is undertaken. Students should illustrate by citing examples, e.g., electronics that build automated telephone exchanges are an example of sustaining technology. The silicon chip, which produced the iPhone, is an example of disruptive technology.

- 2. What is the substance of the claims by economists since the 1930s, such as Kondratieff, Schumpeter, Perez, and others, regarding technology and cycles of economic growth?**

This question examines theories of long-cycles of economic activity. Students should outline the four long cycles examined in the chapter before examining Kondratieff's theory that, beyond short-term business cycles, industrial capitalism generally adapts and mutates. A comprehensive answer would also explain the theory that industrial capitalism had a 50-year pattern whose turning points coincided with major technological and structural changes and major conflicts. Students should explain that each long cycle has, according to Kondratieff, an upswing lasting about 25-years, fuelled by the deployment of new technologies, the rise of new business models, new countries entering into the global market, high capital investment and a rise in the quantity and availability of money. Kondratieff's most controversial point is that the start of each 50-year cycle was 'triggered' by the application of innovation/technology. Schumpeter theory that each of Kondratieff's waves as an 'innovation cycle' and Perez's thesis that the primary focus of long-wave theory is the disruption and gradual assimilation of each technological revolution, not the upswings and downswings in GDP, should also be explained. Better students might also discuss whether Kondratieff's and Perez's theory provides an insight into the 2008–19 crisis and cycle .

- 3. 'If we do not understand how complex technologies function then their potential is more easily captured by selfish elites and corporations.' (Bridle 2018, p. 3). Explain.**

A comprehensive answer would explain how new so-called 'smart' technologies and AI are not neutral facilitators of data collection and decision-making: they embody our values, politics and in the context of the firm management control strategies. Students should draw from the 'Counter point' and 'mini-cases' feature for examples.

Better students will also recognize that there is a causal relationship between the complex opacity of the systems we encounter day-to-day and global issues of inequality.

**4. Discuss how multinational companies could contribute to the global diffusion of technology. Illustrate your answer with examples.**

It would be useful for students to clarify their understanding of the terms, multinational company, and also technology and the diffusion of technology internationally if question 1 is not discussed in the same session. The question encourages students to discuss the ease with which big resource-rich MNCs can transfer technology across borders between their subsidiaries, by selling technology based goods and services to foreign customers and to their influence over the production processes and practices of foreign suppliers. Better students might also recognize that the ability to transfer technology may be affected by the control structure e.g. transfer is more likely to be facilitated in MNCs where control is more centralized. Students hopefully will address the issues around the measurement of technology and technological diffusion e.g. as regards R&D expenditure, patents taken out both at home and abroad, off-shoring/outsourcing.