MET IIB Paper 2 2026 Cribs

Question 1

(a)

Basic answers

Demonstrates understanding of the differences between the two scenarios. In the first the emphasis is on the start-up and scale-up activities of the business, so there should be discussion of the move from informal to more formal approaches as the organisation grows, the key role of recruitment – and letting people go – as the needs of the organisation changes and the requirements of the business and its key stakeholders (especially its investors) becomes clear. For the second scenario, this is about change management (needs to show awareness of role of a leader in any change management project) but in the context of something so serious it could destroy the organisation. Even the basic answer should be able to present a structured answer that draws upon the theories and models presented at the start of the module, along with the rich case studies provided by the guest speakers, and the module readings. There should be clear demonstration of understanding of **the role of the leader** in these scenarios.

Better answers

These will show greater understand of these issues by comparing and contrasting different examples from the module and associated readings, to show that while there are clear generic approaches to leadership through firm growth and response to crises, the specifics of the context really matter. The cases used of NHS during Covid-19, Fortesque, Tate and Lyle, Alphabet X provide rich evidence on which the students can draw to show commonalities and differences. The better answers will also draw upon more of the leadership theories to show how different leadership styles might be appropriate at different phases of each scenario.

Excellent answers

Will reflect on the need to address challenges in each scenario based on **actual available** leadership capabilities, demonstrating awareness of often-seen gap between the theory and practice. These strongest answers would also be able to use structures from the models presented to provide a nuanced discussion of the complex issues facing leadership in each scenario.

(b)

Basic answers

For (i), there needs to be demonstration of understanding that this is a double challenge: working with an external organisation, and also managing an internal change management project. The basic answer needs to be able to present a structured discussion of the challenges of a large, bureaucratic organisation seeking to work with a smaller start-up company. For (ii), there needs to be awareness of the various ways discussed in the EGP and LM&P modules for how governments work with firms to support change to support the achievment of some specific KPI (e.g. adoption of new digital technologies to support increased productivity in the manufacturing sector). The material presented in the EGP module on knowledge generation>diffusion>deployment/absorption and the example of Made Smarter provides one way of structuring this discussion.

Better answers

For (i), we'd expect to see strong evidence of understanding of the implementation challenges of working with an external firm to acquire a new technology, and the specifics of the impact of the asymmetries of the two organisations. There would also need to be strong discussion of the issue of scaling up the changes beyond a single factory. Use of change management frameworks such as Kotter could be helpful to provide structure, but each description of each element needs to provide evidence of the reality of implementation in this context. For (ii), we would expect to see reference to the broader operational challenges of working with government-related support programmes, especially in the more from pilot project to wider rollout.

Excellent answers

For (i), issues such as difference in data / AI literacy could be very relevant. Form examples covered in class and in the readings, there are plenty of examples of the challenges of rolling out data/digital projects that could be referenced here. For (ii), there would be discussion of some of the unintended consequences of raising internal capabilities through external acquisition, e.g. working to upskill your workforce to make them highly employable by your competitors. It would also be good to see reference to other benefits of working in government programmes, e.g. peer-learning through networks of companies brought together through such programmes.

Question 2

(a)

A basic answer should cover a description of quantum computing. A quantum computer uses the principles quantum mechanics (like superposition and entanglement) with qubits to process information. Through the use of these properties of quantum mechanics, the quantum computer could speed up computation and solve complex problems which would be impossibly slow for classical computers to compute. The benefits include:

i. Breakthrough capabilities in optimization - financial risks (valuation, fraud detection), energy infrastructure and manufacturing operations
ii. Efficiently simulate quantum systems - new drug discovery and new materials (for clean energy)
iii. Enhance speed of AI and machine learning

A better answer should cover the above plus the following. A discussion of how quantum mechanics allows quantum computers to solve complex problems which would be impossibly slow for classical digital computers by exploring many solutions at once (this is a combination of using superposition and entanglement). Hence, the firms should identify problems that where speed up of computation using the advantage of quantum computers in being able explore many solutions at once would add to competitive advantage for the firm. Moreover, a discussion that quantum computers work on the principles of probabilities (compared to classical digital computers that are deterministic) would highlight the benefits and costs more clearly.

A 'best' answer should cover the above plus the following. A discussion that quantum computers are faster for complex problems compared to classical digital computers but slower for simpler problems. Hence, the quantum computer would complement digital computers and would not replace them. Moreover, a discussion that early-stage quantum computers have errors that need to be corrected (and hence adds to the cost) would enhance the answers (before a fully fault tolerant quantum computer is built).

(b)

A basic answer should cover the adoption of quantum computing for the purposes of improving efficiency compared to effectiveness of the business. The answer should describe how efficiency improvements of existing business problems by completing the tasks faster (or perhaps with less energy) on a piecemeal basis independently of new customer value propositions could result in marginal improvements in productivity and performance. In order to achive significant improvement of productivity and performance of the firm, a coordinated approach would be required to change the core processes to deliver the new customer value proposition enabled by quantum computing. Such a change would require business model innovation to have an impact on the competitive position of the firm. Moreover, a basic definition of business model innovation including the changes to value proposition, value creation, value capture and value network would enhance the anwswer.

A better answer should cover the above plus the following. The discussion should cover the difference between strategy formulation, the business model and the operating model – the discussion should cover responsibilities for these by senior management and how such governance could lead to piecemeal adoption. The answer should then go on to discuss how the adoption of quantum computing could result in reduction in productivity and performance due to the relative costs of integrating a quantum computer with the digital computer could increase costs relative to the benefits. The discussion would then need to be developed further on how best to identify new customer value propositions to enhance the benefits which might require business model innovation.

A 'best' answer should cover the above plus the following. The discussion should include a more critical evaluation using examples from the adoption digital computing that needed business model innovation such as the following:

1. e.g., Retail -Walmart; Walmart had to get its supply chain partners (including manufacturers) to adopt digital computers that allowed Walmart to share inventory data and hence manage the inventory better and also change its logistics and delivery methods accordingly.
2. Manufacturing industries – where the early deployment was merely to digitise existing processes before the utilisation to customise products using Computer Aided Software (CAD).

(c)

A basic answer should cover the description of the Business Model Coherence Scorecard. \in particular it is a framework that enables the measurement of how coherent a business model is following the adoption of new technologies. In particular, it measure alignment across four key perspectives:

1. *Decision Rights*: Is authority given to the right individuals or systems?
2. *Incentives System*: Are incentives appropriately aligned across stakeholders?
3. *Material Flow*: Are materials and products/services delivered at the right time and place?
4. *Information Flow*: Is decision-making information delivered to the right people/systems in a timely fashion?
5. *Partner engagement challenges*: Are partner firms' incentives across the ecosystem aligned?

One of the opportunities for Boomerang Ltd includes the ability to reschedule the logistics and delivery function based on new information (e.g., collecting returns, sick leave of drivers, accidents and road blockages etc) on the day. Explain that classical digital computers often need an overnight run to schedule the operations. Hence, a quantum computer could make rescheduling more efficient which can increase productivity. The challenge could be related

i. Translating quantum concepts for business managers and engineers so that they understand the benefits as well as the costs
ii. Protecting against the cryptographic threat of quantum computers (how would the

Managing quantum computers and how it will be complementary with digital computers would be key – costs of integration and its benefits could be assessed using the Business Model Coherence Scorecard (in particular, how would this change the decision rights, incentive system and information flow for example between procurement, logistics and marketing). Moreover, the material flow (items that need to be delivered needs to be managed differently as a result of being able reschedule the logistics intra-day).

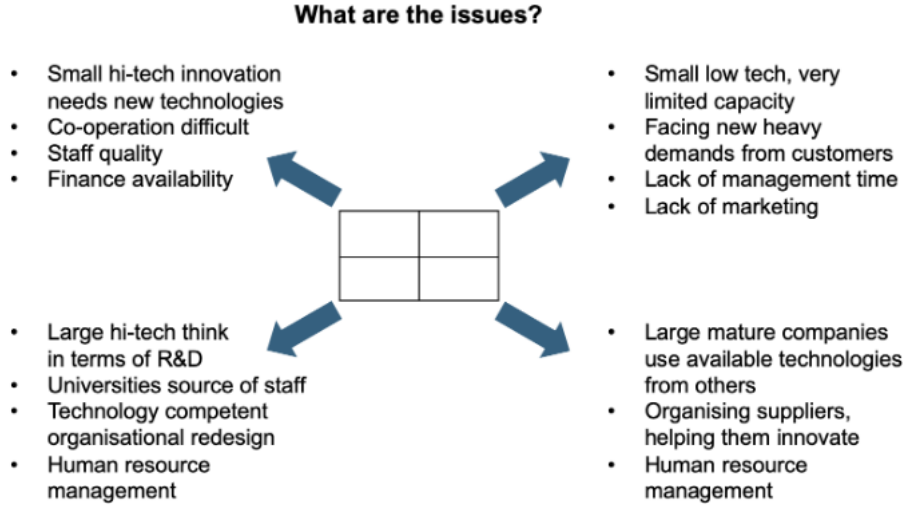
A better answer should cover the above plus the following. A discussion of how to decide on which quantum computing platform to use for the business problem and how to decide on which could be computed on classical digital computers and what needs to be done on a quantum computer respectively. Moreover, whether the quantum computer needs to be in-house or outsourced would need to be discussed – the factors such as speed, security, reliability etc. In particular, a discussion of the decision rights, incentive system and information flow with respect to speed, security and reliability would need to be discussed and also the challenges of managing external partner and their incentives would be helpful to consider within the BMCS framework. In addition, the discussion should include how to get buy-in from managers in the deployment of quantum computers, especially given the changes in tasks and responsibilities of workers.

A ‘best’ answer should cover the above plus the following. Changes in the core processes as a result of quantum computers in one function could have knock-on effects across other functions both within the firms as well as across other firms in the industry (e.g. whether retailers might want to manage their own logistics as result of adopting quantum computers; whether retailers might change their inventorying methos i.e., in terms of where the items are stored etc – the partner firms incentives and what types of information they need to have to manage their operations profitably). How to identify and manage these related changes in core processes both within and across firms needs to be discussed using the Business Model Coherence Scorecard concept and a discussion of how the concept might be used to address these challenges.

Question 3

(a)
Excellent answers provide a well-structured and precise classification. They explicitly name and clearly describe the relevant firm type as defined in the lectures (i.e. Technology intensive, small firm). They systematically relate to elements of the preamble (firm size, technological depth) to the defining characteristics of this category.
Excellent answers go beyond listing challenges, e.g. may give examples. They may contrast this firm type with other firm types of the framework to strengthen their argument.

	Technology intensive	Technology contingent
Small	• Specialist Hi-tech • University spin-offs • Corporate spin-offs • Science park based	• Most numerous class • Regional companies • No R&D
Large	• Leading innovators • Global competitors • R&D intensive • Multinationals • e.g. pharmaceuticals, electronics	• Incremental innovators • Mature markets • Low R&D/Use suppliers • e.g. large commodity • manufacturers, food, • agriculture

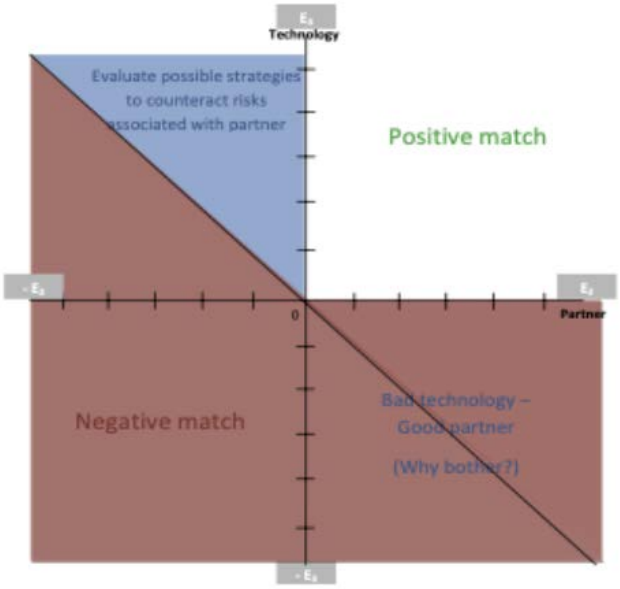


Excellent answers are precise, and grounded in the lecture material, demonstrating a strong grasp of the framework.
In contrast, good answers correctly identify the firm as a specific type of technology-based firm according to the lecture framework and demonstrate a clear understanding of its defining characteristics. Such answers describe key features such as strong reliance on advanced technological knowledge, a small organisational scale, limited resources, and a focus on developing and refining core technologies rather than large-scale production or market dominance.
Good answers explain typical challenges associated with this firm type, for example constraints in financial and human resources, high technological uncertainty, difficulties in scaling up, and tensions between ongoing R&D and commercialisation. References to lecture

concepts are present, but they may remain relatively general. Descriptions are coherent but may rely on a limited number of points or lack depth in linking firm characteristics to specific challenges.
Basic answers will only provide a generic description of the firm type, without explicit reference to the framework.

(b)
Excellent answers are well structured and may identify, i.e. relate the embedded control and energy management system to software to patentability criteria discussed in the lectures, such as technical contribution and industrial applicability, and explain why patent protection may be strategically valuable given the visibility of the system and the risk of imitation.
Excellent answers clearly explain why the user-interface software is better protected through copyright, potentially supplemented by design considerations, and articulate the limits of patent protection for such components. They may also consider the role of trade secrets for algorithms or parameters that are difficult to reverse engineer, and briefly reflect on the supporting role of trademarks, noting their more limited strategic importance in an industrial B2B context. They may also identify that the integration know-how is key to the company, which could be protected by trade secrets.
Excellent answers are thus multi-argumentative, grounded in lecture concepts, and use concrete examples from the described technology stack to justify how and why the IP strategy should be expanded beyond hardware patents.
Good answers recognise that the company's existing, hardware-focused patent strategy can be expanded to address the software components embedded in the containerised hydrogen energy plants. Such answers correctly identify that different types of software are involved and explain that this has implications for the choice of protection instruments.
Good answers explain that embedded control and optimisation software, which is tightly integrated with the physical system and contributes to technical performance (for example efficiency, stability, or safety), may be protectable through computer-implemented inventions, provided the software contributes to a technical effect beyond mere data processing. They also identify that user-facing software, such as operator interfaces and visualisation dashboards, is more appropriately protected through copyright, as it primarily concerns code, structure, and presentation rather than technical functionality.
Good answers thus provide coherent explanations of the advantages and limitations of the respective protection mechanisms, but may remain relatively general, rely on a limited number of arguments, or provide few concrete examples.

(c)



An excellent answer will systematically evaluate all three options by clearly referring to the relevant lecture concepts of Technology Selection and Acquisition. Such answers would explicitly use the Partner-Technology Matching Matrix to plot the options and provide a multi-dimensional justification for each placement. Excellent answers may produce an associated multi-criteria scoring table (see example below).

Option	Technology Match	Partner Match	Strategic Reasoning & Lecture Link
A: University Spin-out	**Medium**	**High**	High cultural alignment ("deep tech" focus). However, technology requires substantial investments.
B: Industrial Diversifier	**Low**	**Low**	Significant "cognitive distance" or cultural clash between an agile SME and a rigid, "Six-Sigma" corporate hierarchy. Technology offers low differentiation.
C: Specialist Competitor	**High**	**Medium/Low**	Strong technical "plug-and-play" fit[4]. However, introduces high "reputational risk" to direct competition.

An excellent answer will conclude with a clear recommendation. These could be, for instance:

> Recommendation A (Strategic Bet): Focuses on long-term efficiency leadership despite some risks. Justified by the firm's identity as a "Deep Tech" company relying on technical expertise.
>
> Recommendation C (Market Fast-Track): Focuses on immediate integration and modular compatibility to meet urgent market demand, acknowledging that the "Partner Match" must be managed through collaborative frameworks.

A good answer would be less systematic in its presentation (e.g., not proposing a clear comparison table) and might be less specific in mapping the descriptions to the matrix dimensions. It would likely correctly identify the general pros and cons of each partner type (e.g., "start-ups are innovative but risky," "large firms are stable but slow"). Good answers may mention cultural differences but without specifically linking them to lecture concepts like "asymmetric partnerships" in Open Innovation. Good answers would provide a recommendation that is sensible but relies more on general business intuition rather than a structured evaluation of the two dimensions.

Question 4

(a)

Basic answer: A basic answer will define a supply chain as a network of firms performing value-adding activities across dispersed geographies, involving flows of products, finance, and information. It will explain risk as the likelihood and impact of an event disrupting the supply chain, vulnerability as the inability of the supply chain to withstand such events, and resilience as the capability to prepare for, respond to, recover from, and grow after disruptions. The answer will note that disruptions may arise from events such as natural disasters, geopolitical conflict, pandemics, or technological failures.

Average answer: An average answer will build on these definitions by explaining how risk emerges from the interaction between events and vulnerabilities, rather than from events alone. It will describe how globalised and tightly coupled supply chains amplify risk, allowing disruptions to propagate across multiple tiers. The answer may contrast traditional risk assessment approaches (probability × impact) with more systemic views of supply chain risk, and will include examples such as production stoppages due to supplier failure or capacity constraints in upstream tiers.

Strong answer: A strong answer will integrate the concepts into a systemic perspective of supply chain resilience. It will explain that efficiency-driven supply chain designs can reduce flexibility and increase fragility, particularly in critical or highly concentrated supply chains. Strong answers will link resilience to capabilities such as redundancy, flexibility, collaboration, and information sharing, and will demonstrate how disruptions can cascade across multi-tier networks. Examples may include global manufacturing disruptions following geopolitical shocks or pandemics, illustrating how risks materialise beyond tier-1 suppliers.

(b)

Basic answer: A basic answer will explain ‘blind spots’ as areas of limited or absent visibility within multi-tier supply chains, particularly beyond tier-1 suppliers. It will define supply chain visibility as the ability to see activities and flows across the supply chain, traceability as the ability to track and trace products and materials, and transparency as a deeper contextual understanding of processes, risks, and impacts. The answer will state that blind spots increase exposure to economic, social, and environmental risks.

Average answer: An average answer will build on this by explaining how blind spots arise from fragmented data, lack of information sharing, and complex network structures. It will discuss how improved visibility and traceability enable firms to identify risks earlier,

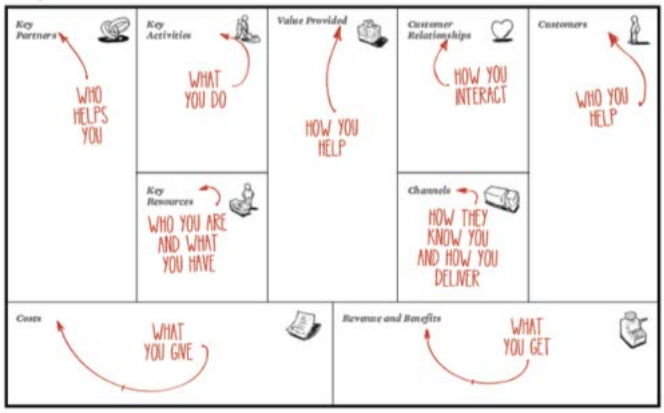
monitor supplier behaviour, and respond more effectively to disruptions. The answer will link visibility to decision-making at strategic, tactical, and operational levels, and may use examples such as undisclosed labour practices, raw material shortages, or unrecorded upstream environmental impacts.

Strong answer: A strong answer will integrate blind spots with supply chain resilience theory. It will explain that visibility, traceability, and transparency are not ends in themselves but enablers of resilience, allowing firms to reduce vulnerability and improve preparedness and recovery. Strong answers will refer to end-to-end visibility across multiple tiers and the use of diverse data sources (public, private, and commercial) to overcome information gaps. Examples may include critical mineral supply chains, where lack of upstream visibility leads to ethical, environmental, and geopolitical risks, and where improved transparency enhances both resilience and sustainability outcomes.

Question 5

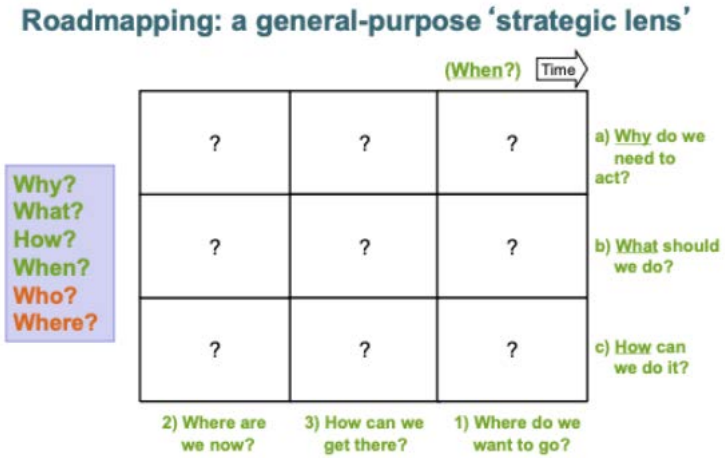
(a)

An excellent answer provides a detailed description of both tools. Such answers may describe the Business Model Canvas as a visual activity system that represents the underlying business logic of a strategy by connecting internal resources and processes to external stakeholders. It functions as a bridge between value creation and value capture through nine integrated building blocks, including the Value Proposition, Customer Segments, Channels, Customer Relationships, and Revenue Streams, while accounting for the Key Activities, Resources, and Partners that drive the Cost Structure.



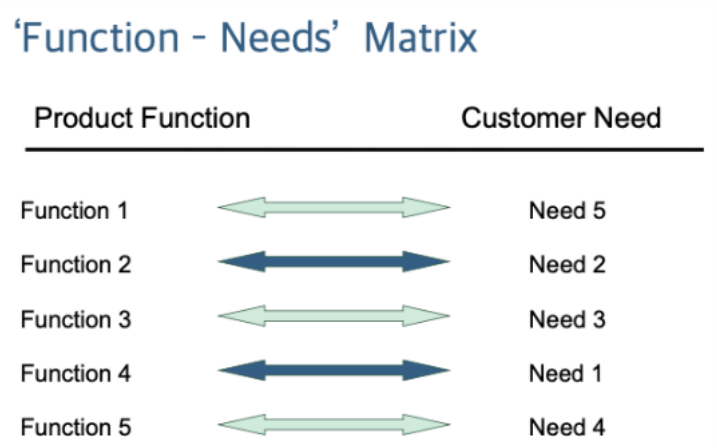
Simultaneously, excellent answers may describe Roadmapping as a structured visual chronology of strategic intent that serves as a general-purpose dynamic systems framework.

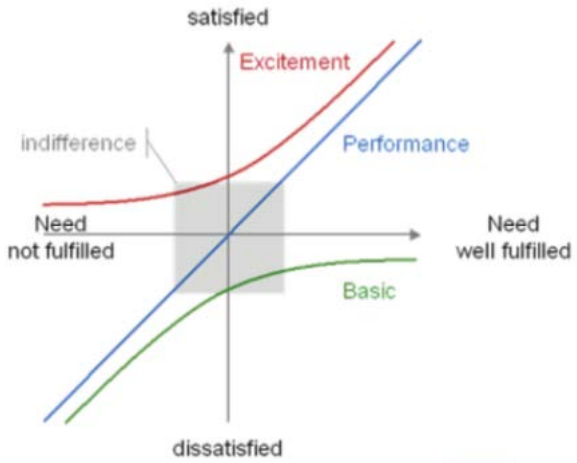
This tool is explained as a temporal-spatial lens that typically uses horizontal layers to link external Market and Business drivers to internal Product features and Technology resources over a multi-year time horizon. Ultimately, it effectively addresses the "Why, What, and How" of a corporate transition by mapping out how a company will move from its current state to a future strategic vision.



Good answers might correctly identify the core purpose and basic structure of both strategy formulation tools, but describe both tools in more generic terms. For instance,
they might describe the Business Model Canvas as a framework used to visualise a firm's strategy and logic, helping managers answer key questions about what the offer is, who the target market constitutes, and how that offer is delivered to the customer. They note that it covers several essential areas such as key partners, activities, and value propositions to ensure the company understands how it will generate revenue and manage its costs.
Regarding Roadmapping, good answers might define it as a summary graphic used for visual strategy and communication, primarily focusing on how technology and products will evolve over a period of many years. The students describe that the method uses a timeline to coordinate different organizational perspectives, such as research and development alongside market needs, to show the path towards a long-term goal. Overall, good answers show a clear understanding of these tools as methods for planning a company's future direction and the allocation of its resources.

(b)
Excellent Answer provide a detailed conceptual distinction. Such answers provide a sophisticated comparison, identifying that the Function-Needs Matrix is an analytical tool for strategic alignment (e.g. ensuring that technical functions in the heat pump translate to a customer benefit), while the Kano Model is a behavioural framework used for qualitative prioritisation. Excellent answers would also provide a contextualisation, i.e. apply the three Kano categories specifically to SolarFlow's transition. For instance, basic needs (e.g., safe, reliable heating) are "must-haves" where failure leads to extreme dissatisfaction; Performance factors (e.g., energy efficiency ratings or unit costs) act as Order Winners where satisfaction increases linearly with performance; and Excitement factors (e.g., AI-driven autonomous energy optimization) are "delighters" that provide Differentiation Advantage.





The **three** categories of customer need of the Kano model

Excellent answers may also refer to the concept of Strategic Reconciliation to explain that while the Matrix confirms if a requirement is met, the Kano model helps SolarFlow manage trade-offs. For instance, they might argue that over-investing in AI ("Excitement") could compromise the product's "Performance" if it drives the price too high for the target segment. Excellent answers may also distinguish between Order Qualifiers (Basic needs) and Order Winners (Performance/Excitement factors), showing a high level of integration between the TIM and Marketing modules.
In contrast, good answers may rather describe the Function-Needs Matrix as a tool to map product functions against user needs to ensure that engineering efforts match market requirements. Such answers may only identify the three categories of the Kano Model (Basic, Performance, and Excitement) and explain how they relate to user satisfaction. Good answers may make a clear attempt to apply these to SolarFlow, noting that a heat pump must first be reliable (Basic) before it can be marketed as smart or efficient (Performance/Excitement). Good answers might conclude that using both tools together can help SolarFlow avoid building a "technically superior" product that the market does not actually value. Good answers tend to be well-structured and arrive at a clear conclusion regarding why both alignment and prioritisation are necessary for a successful new product introduction (NPI).

(c)
Excellent answers are expected to provide a sophisticated synthesis of the Make-or-Buy Matrix, correctly identifying the divergent paths for SolarFlow's physical and digital capabilities based on their future strategic value. Regarding the Smart Grid Optimisation

Algorithm, answers might argue that this capability represents will be of High Importance to the business in the future and having such capability internally will offer the company a strong Competitive Position. Consequently, the students would recommend the generic strategy to "Continue to Invest" or "Maintain Capability" internally to ensure the firm controls the primary engine of its future value creation.
In contrast, for Boiler Casing Manufacturing, students would identify this as having Low Importance in the future smart-energy ecosystem and providing a Weak Competitive Position as the industry shifts toward commoditised hardware. The recommended strategy here is to "Outsource" or "Stop" internal production, finding a commodity supplier to handle the physical casing while SolarFlow focuses its resources on higher-value activities. Excellent answers are well structured and integrate their answers with specific details and examples.

Competitive position	Importance to Business: High	Medium	Low
Strong	Continue to invest Maintain capability	Consolidate Keep pace	Open options Further analysis
Neutral	Invest Develop	Partnership	Stop Outsource
Weak	Initiate R&D Examine for investment or cease, find comaker	Partnership	Stop/Monitor Sell/license Design out find commodity supplier

Likewise, good answers will also demonstrate a clear and accurate application of the Make-or-Buy Matrix to the two scenarios provided arriving at similar conclusions.
Good answers make a clear attempt to link these decisions to the company's broader transition.
Good answers would be well-structured and show a solid understanding of how a firm can use the matrix to decide which resources to maintain in-house and which to obtain from the supply network to achieve a competitive advantage.

Question 6

(a)

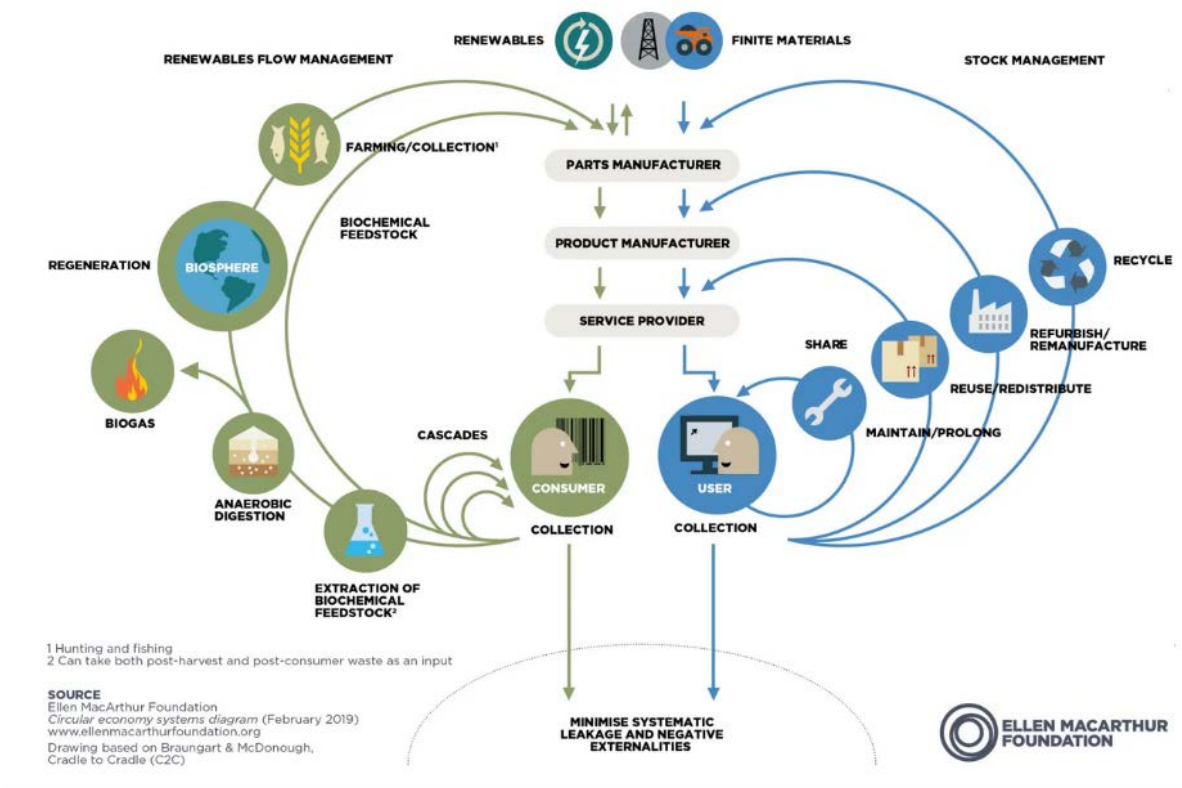
Industrial symbiosis is the idea of using waste output from one company or process as the raw material input for another company or process. To do this, energy, material, water, and information exchanges can be or must be used. IS reduces the demand for fresh resources, making more complete use of existing resources. It is considered one starting point for implementing a circular economy. In order to be considered true IS, it must be mutually beneficial to all companies involved. Examples include Kalundborg (multiple companies) or British Sugar (one company), among others.

(b)

The circular economy is a systemic model of the flow of energy, materials, and products for production and consumption. It may also be considered as an approach to economic development. It is an industrial economy that is regenerative and restorative by design. In a circular economy waste and pollution are minimized through recycling, repairing, refurbishing, and reusing products as they reach their end of life, and waste itself can be considered a resource. This model attempts to circulate products and materials within the existing ecosystem, so that fewer raw materials are needed, and used products don't end up in a landfill. It also attempts to regenerate nature, through minimizing the use of non-renewable resources, in favor of renewable ones, such as renewable energy.

Benefits include:
- reduced pressure on the environment
- enhanced security of raw materials
- increased competitiveness
- innovation & growth
- reduced obsolescence
- improved human health

Challenges:
- cost – shifting to the circular economy could require significant investment
- changes in consumer behaviour would be required
- governance issues would need to be coordinated over huge areas and policy levels
- limited technical knowledge for how to recovery, recycle, or reuse some products



The major loops are:
Share – share the product or service with someone else to make greater use of it
Maintain / Prolong – keep the product in good working order, so it does not fail and need to be replaced
Reuse / Redistribute – once the product has reached the EoL in its current application, can it be directly reused in the same application at a lower operational level or
in another application.
Refurbish / Remanufacture – can the product be fixed (in whatever capacity needed) to make it useful again
Recycle – can the product be broken down into constituent bits for use in a new product

(c)
Product-oriented services business models.

- Maintenance: Maintain / Prolong
- Repair: Maintain / Prolong
- Remanufacturing/Refurbished: refurbish / remanufacture

User-oriented services business models.

- Leasing: Share
- Renting: Share
- Sharing: self-explanatory
- Pooling: share

Result-oriented services business models.

- Pay per use: share
- Outsourcing: share
- Pay by result: share

End of life services business models.

- Recycling: recycling
- Repurposing: reuse / redistribute (or potentially remanufacture / refurbish, but doesn't fit as well)
- Disposal: N/A or recycling (because this one doesn't fall into a specific category particularly well) or landfill (which isn't a loop, but is a real answer)

Lots of Share and Maintain / prolong services, but not many of the others. Suggests that there may be new business opportunities using these other loops. Depending on how they assign loops, there could even be an unused loop.

Answer standards:

Basic answers: Demonstrate understanding of the underlying technology of recycling and its environmental justification. May demonstrate lack of knowledge and understanding of some important factors. Examples may be inappropriate. The discussion may be superficial and inaccurate.
Strong answers: Good depth of knowledge and understanding. Will cover the key environmental aspects and provide adequate discussion with pertinent examples discussed with accuracy.
Best answers: Detailed descriptions and analysis. Demonstrate understanding of the more subtle tensions in the environmental assessments. Examples will draw on experience from many different parts of the course together with the student's own observations. The discussion will be critical and insightful.