

EGT2  
ENGINEERING TRIPOS PART IIA

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DATE TBD

TIME TBD

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**Module 3E11**

**ENVIRONMENTAL SUSTAINABILITY AND BUSINESS**

*Answer not more than **two** questions.*

*All questions carry the same number of marks.*

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

*Write your candidate number **not** your name on the cover sheet.*

**STATIONERY REQUIREMENTS**

Single-sided script paper

**10 minutes reading time is allowed for this paper at the start of the exam.**

**You may not start to read the questions printed on the subsequent pages of this question paper until instructed to do so.**

1 A UK-based online grocery retailer that delivers to customers has seen massive growth as a result of more people ordering groceries online during the pandemic. Following COP 26, the retailer is considering setting a Net Zero commitment, to achieve net zero CO<sub>2</sub> equivalent emissions.

The manager in charge of advising senior management on the decision to commit to Net Zero has heard that it's a good idea to prepare a materiality matrix before making major strategic commitments on sustainability.

(a) Outline the purpose and key elements of a materiality matrix and suggest what the company would need to do if it were to undertake preparation of a materiality matrix. [25%]

*Key purpose is to assess and prioritize the 'material' aspects of sustainability for that company; ie the aspects that matter to its short, medium and long term ability to generate value – they can refer to the definitions (e.g. GRI) given in class sides or not in explaining this.*

*The key elements are the X axis which plots the impact on the business of the given sustainability aspect; and the Y axis which plots the importance to stakeholders of the given sustainability aspect. High on both axis indicates a higher priority/more material aspect. This is a minimal explanation of the matrix purpose and elements. Additional points for stronger answers may include:*

- sustainability aspects should be E, S & G*
- stakeholders are many and diverse and will differ by company; not all stakeholders will agree on their evaluation of sustainability aspects*
- materiality assessments are imperfect and subject to several challenges including exclusion of certain topics or stakeholders, they take a lot of time to prepare well, and they may not actually be used to inform strategy, but more used to communicate with the public. Some might note that the use of materiality matrixes 'peaked' a few years ago and they appear to be less expected in company reports. This may be due to some of their shortcomings.*

*In addressing what the company would need to do, students should identify some/most of the main steps in rough order: identify external stakeholders, consult widely internally with those who have different perspectives on the issues and the business, conduct interviews/focus groups/surveys with these informants, collate and analyse the inputs, identify the ESG aspects that matter (including input from experts conducting the*

assessment), possibly use a resource like SASB to begin with some or all of the ESG aspects for the sector, rank and prioritize the aspects based on the input for the X and Y axes, display these on a matrix, discuss and evaluate what this means for prioritising aspects, and use these prioritised aspects to drive strategy. Some (stronger) answers will note that many companies may not go all the way through this process or may do it in a way that is largely derivative of prior materiality efforts. Some may also note that companies can (and often should) rely on resources that help outline material aspects by sector, as it can be a waste of resource for every company to do the full effort, especially annually.

(b) In this case, should the company prepare a materiality matrix before making a Net Zero commitment or not? What considerations support each option? What would you advise they do? [50%]

*Various observations can be made about the considerations, many of which are included in the crib notes for part (a); these will point to the effort and time taken to perform a materiality matrix and may lead to questioning whether it's really important in this case, or may be used to argue that it's essential to do the matrix as a first step to a sound strategy. Additional considerations include the students' evaluations of the ESG aspects for this company/sector, and they may conclude that other issues, like foodwaste or packaging are more demanding of attention than Net Zero.*

*Essentially, a strong argument could be crafted to support doing a materiality matrix first, and it would rely on the need for the company to carefully and deliberately engage with its own ESG aspects and its distinct strategy, before rushing to 'follow the crowd' on Net Zero; OR a strong argument could be made around the urgency of climate change as an issue and its importance to various stakeholders, supported by the observation that one may well not need to perform a full materiality assessment before acting on this (time and resource may be better spent on setting a wise Net Zero commitment and generating plans and actions).*

*Stronger answers will include some consideration of 'both sides' of the argument and a well supported conclusion as to which recommendation is made. They will also engage with the course content and concepts (beyond only materiality) with accuracy and some degree of nuance.*

(c) Assume the company does set a Net Zero commitment. What time frame (e.g., by 2030, 2050, etc.) should they use for this commitment, and should they include only their own operations (scope 1) in their commitment, or their supply/value chain (scopes 2 and 3)? Explain your reasoning as part of your answer. [25%]

*Any evidence that the student is thinking broadly about the implications of the time frame (what is possible to achieve, what is too long to be meaningful, what will competitors be doing), should be recognized.*

*In terms of scope 1 versus 2/3, it should be recognized that scope 1 is likely not enough, as expectations these days suggest it is suspicious to set such a commitment without acknowledging significant impacts in the supply chain and throughout consumption (fertilizer use, food waste etc have considerable impact in grocery retailing; an online retailer has mostly warehousing/refrigeration and delivery emissions to consider for scope 1, but students should recognize that some of this – eg purchased energy for refrigeration or lights is scope 2).*

*Stronger answers will divulge some degree of nuanced understanding of the tradeoffs around addressing timing and scope, and should support the answers with reference to additional course content (eg use of LCA).*

2 Pressures and opportunities for companies to address sustainability practices have historically come from many different groups or sources, including regulators/regulation.

(a) Name and explain or illustrate three further (beyond regulators/regulation) groups or sources currently exercising pressure on (or posing opportunities for) companies to alter their sustainability practices. What could happen if companies fail to respond to each of these groups/sources?

[30%]

*Responses can include any three of the ‘wedges’ shown in the slides on pressure/opportunities slide deck. E.g. advocacy groups, investors, insurers, employees, consumers etc. The explanation should include some elaboration of why or how that group exercises pressure, and may be illustrated by a specific example (but need not be). The final question should be explicitly answered for each of the three. Eg for investors the explanation is they are putting pressure on companies, especially those with large carbon footprints, because they now consider it risky to lend to companies with carbon risks. What might happen if a company failed to respond to this is that they would lose investment/lose access to needed capital in the future.*

(b) The only way that companies will act at sufficient scale and with sufficient speed on climate change is through the imposition of strict regulation. Discuss.

[70%]

*Response should recognize that regulation is only one force pressuring companies to act, and it may not be the one they are currently most responsive to (e.g. investor pressure may dominate). Responses should also divulge the range of other possible pressures on companies (see wedges slide as in part a above), and recognize that regulation is not perfect (!) ... it is rarely fast enough, enforceable, nor covers all the necessary jurisdictions to give it 'teeth.' Answers could raise the fact that we have been working on/waiting for effective climate regulation for decades OR they could point to some effective areas where regulation has worked for other "tragedy of the commons" problems (Montreal protocol; cleaning up rivers etc).*

*Stronger answers will recognize that none of the groups or sources exercising influence over companies act alone, and will lay out some interactions – eg the public, through advocacy groups, can spur regulators to enact regulation, etc. As well, they might recognize limits of other forces – e.g. we can't expect investors or consumers to be very effective in the absence of regulation that would help establish criteria for good reporting/measurement of climate impact.*

*As with all questions, the stronger answers will effectively leverage course concepts, draw effective connections between them, and display a degree of nuanced understanding, having considered more than one set of arguments/sides of the question.*

3 A company manager notices employees are really keen to better understand sustainability issues and learn more about them so they can integrate them into their daily work. For example, employees in the manufacturing division might come up with more efficient ways to clean the machines or reduce the need for packaging, whereas employees in the sales division might find ways to market the company's products as greener to a new generation of consumers.

(a) The manager is aware that it's important to think in terms of systems when considering sustainability. Hence, they thought it would be a good idea to have all the employees learn about and conduct a personal carbon footprint, in order to learn about their own lifestyles, understand some of the basics of lifecycle assessment (LCA), and get motivated to generate new ideas for the company. Do you think this is a good approach for employee education and engagement? Why or why not? [50%]

*- answers should put reflect solid understanding of why systems approaches to sustainability are desirable, and how carbon footprinting and LCA work, and how they do/don't capture systemic impacts (e.g., details re data, assumptions or simplifying choices, scope of LCA - focused (CO2) vs broad (water, energy, etc); how complete the inventory analysis is/can be; how robust the data are; what steps or components can be 'assumed away' and how complete the impact analysis is in terms of level of detail (e.g. all regions or use cases vs simplified);*

*- answers should also reflect the fact that the company appears to have employees who have different roles and therefore different perspectives on the company/it's issues, so there may not be a 'generic' approach that will work for all. The response could raise the importance of 'cultural framing' or the 'culture wheel' for instilling change, rather than relying on a single model or single set of arguments.*

*As with all questions, the stronger answers will effectively leverage course concepts, draw effective connections between them, and display a degree of nuanced understanding, having considered more than one set of arguments/sides of the question.*

(b) "Only when company managers and employees think and act on sustainability from a systems perspective will they make true progress on any given sustainability issue (e.g., plastics, material consumption, climate change, etc.)" Discuss. [50%]

*- must be able to pinpoint the nature of systems from lectures why they matter to sustainability (interconnections, amplifications, unintended consequences). Should recognize that many – not all- sustainability issues are tragedy of the commons issues,*

*which is a system dynamic/archetype. Responses should recognize why it is challenging to treat things as systems (we see only one part, we seek quick and simple solutions rather than look at long term trends, ... iceberg model)*

*An effective argument can be made/supported either way. Systems thinking may simply be too arcane and its hard to lead to distinct interventions for companies; it requires multiple actors who can influence different parts of the system, etc.*

*As with all questions, the stronger answers will effectively leverage course concepts, draw effective connections between them, and display a degree of nuanced understanding, having considered more than one set of arguments/sides of the question.*

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