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Family Name					
Given Name/s					
Student Number					
Teaching Period	Semester 2, 2018				

ENG417 – Sustainability	DURATION	
	Reading Time:	10 minutes
	Writing Time:	180 minutes
INSTRUCTIONS TO CANDIDATES		
<p>The examination has one (1) section with four (4) questions: answer all four (4) questions.</p> <p>Please write your answers in the booklet provided.</p> <p>Please ensure that your name and student number are clearly indicated on your answers and at the top of this examination paper.</p> <p>Note that all questions are of equal value (25 marks each).</p> <p>This examination accounts for a total of 45 % of the marks available for this unit.</p>		
EXAM CONDITIONS		
<p><u>You may begin writing from the commencement of the examination session.</u> The reading time indicated above is provided as a guide only.</p>		
This is a CLOSED BOOK examination		
Any non-programmable calculator is permitted		
No handwritten notes are permitted		
No dictionaries are permitted		
ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED	
No additional printed material is permitted	1 x 20 Page Book	

**THIS EXAMINATION IS PRINTED
DOUBLE-SIDED.**

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LEFT BLANK.**

Question 1. (25 marks)

A leading thinker on sustainability and industrial ecology, Professor Roland Clift, has been confirmed as the latest recipient of the UK Institution of Chemical Engineer's (IChemE) George E. Davis Medal. Clift will receive the medal following the 12th George E. Davis Lecture at the Royal Academy of Engineering in London ¹.

Clift will use the lecture to assert that chemical engineering is more than just a branch of engineering that supports the process industries. Rather, it is a systematic way of approaching problems based on integrating fundamental scientific principles, quantitatively, and considering complete systems.

Chemical engineering thinking is powerful when applied on a macroscopic scale, and used to tackle problems with economic, environmental, and social dimensions, notably to the sustainability agenda and to the approach known as industrial ecology.

With reference to an engineering process, or an information technology system, of your choice, explain the application of the aforementioned industrial ecology approach in practice.

Reference

- 1 IChemE (2017) Sustainability champion Clift honoured with George E. Davis Medal. The Institution of Chemical Engineers, Rugby, UK. Available from: http://www.icheme.org/media_centre/news/2017/sustainability-champion-clift-honoured-with-george-e-davis-medal.aspx (Last accessed: 14 August, 2018).

Question 2. (25 marks)

Analyse the effects on the local, and national, economies of the Northern Territory Government's decision, in 2017, to lift the moratorium on hydraulic fracturing for onshore hydrocarbon resource exploitation.

Question 3. (25 marks)

Explain the potential implications of the 2018 drought (as evinced by New South Wales rainfall deficiencies, Fig. Q. 3) on the livelihoods of farmers and rural residents from the triple bottom line perspectives of their environment, the economy, and society.

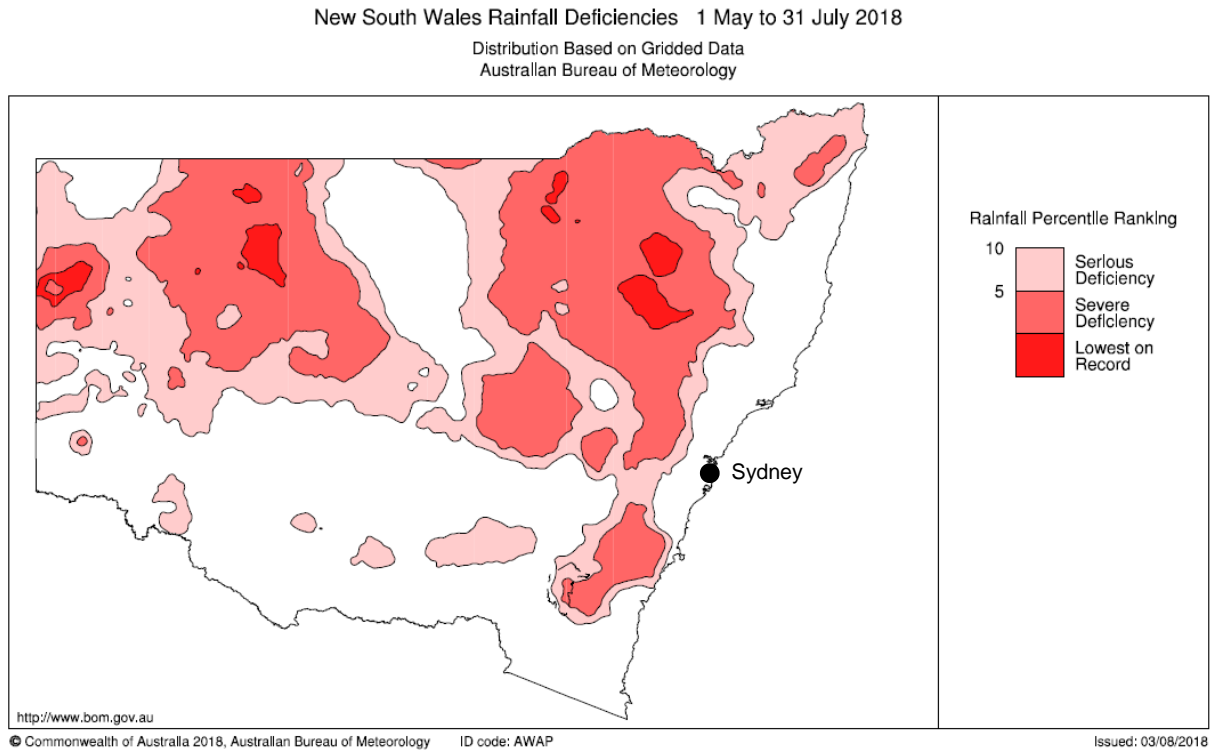


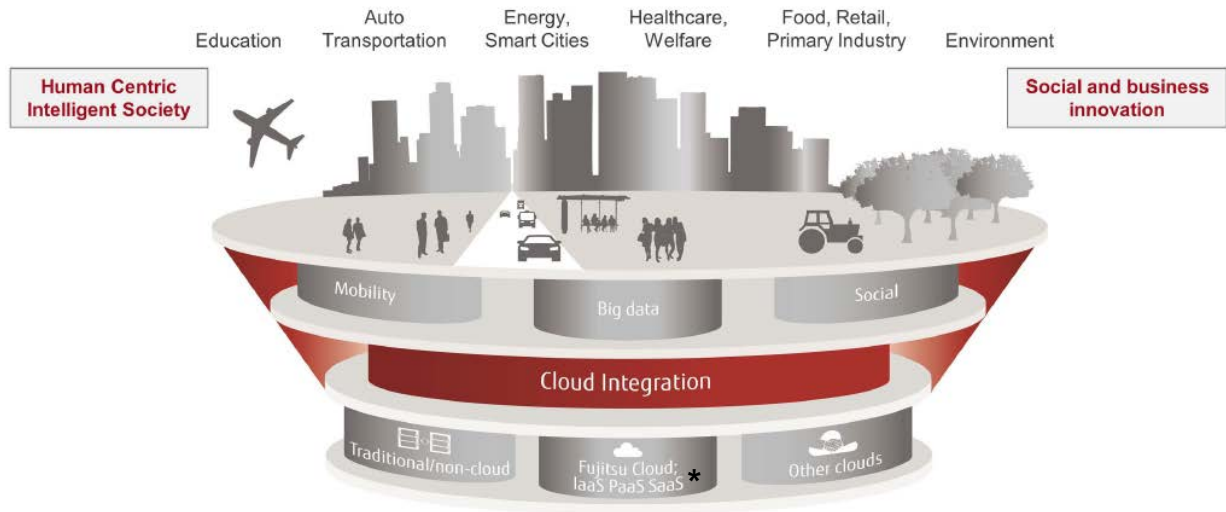
Fig. Q. 3 Rainfall percentile ranking (1 May, 2018 to 31 July, 2018): NSW, Australia ²

Reference

- 2 Commonwealth of Australia (2018) NSW rainfall deficiencies 1 May, 2018 to 31 July, 2018. Bureau of Meteorology. Available from: <http://www.bom.gov.au/climate/drought/drought.shtml#tabs2=Rainfall-deficiencies&tabs=Rainfall-tracker> (Last accessed: 14 August, 2018).

Question 4. (25 marks)

Fujitsu envisage a data integration model centred on their Cloud-based platform (Fig. Q. 4). Explain how green IT and energy techniques can be adopted to maximise the sustainability of such a platform.



*IaaS PaaS SaaS: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

Fig. Q. 4 Envisaging the Fujitsu Cloud: a novel approach to data management ³

Reference

- 3 Fujitsu Australia (2016) Fujitsu Cloud solutions. Fujitsu, Macquarie Park, Sydney NSW. Available from: <http://www.fujitsu.com/global/vision/> (Last accessed 14 August, 2018).