CHARLES DARWIN UNIVERSITY

Family Name	
Given Names	
Student Number	
Teaching Period	Semester 1, 2017

FINAL EXAMINATION	**DURATION**
ENG444 – Hydrocarbon Processing	Reading Time: **10** minutes Writing Time: **120** minutes

INSTRUCTIONS TO CANDIDATES

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a RESTRICTED OPEN BOOK examination

Any non-programmable calculator is permitted

One A4 sheet of handwritten double-sided notes permitted

No dictionaries are permitted

ADDITIONAL AUTHORISED MATERIALS	**EXAMINATION MATERIALS TO BE SUPPLIED**
No additional printed material is permitted	1 x 16 Page Book

THIS EXAMINATION IS PRINTED DOUBLE-SIDED.

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Marks for each question and suggested time allocation are indicated in brackets.

Use tables, graphs and diagrams to avoid writing lengthy essays.

Question 1 (10 marks, 30 min) – Hydrocarbon Reservoir and Production

Using PT phase envelopes and key physical characteristics of fluids, as well as characteristics of the corresponding geological formations, discuss and illustrate the differences in:

1) The initial state
2) The behaviour of reservoir fluids during production
3) The extraction mechanism(s) and
4) Equipment and structures required for extraction

of oil sands and shale gas.

Provide a range of values for each parameter if you can; if not, provide an indication of how various parameters for the two reservoirs compare.

Question 2 (15 marks, 45 minutes) – Hydrocarbon Processing

2.1. Discuss what possible impurities are likely to be encountered in shale gas and in oil sands. Compare the relative concentrations of these impurities. Provide numerical values if you can; if not, provide a qualitative description.

2.2. Propose generalised block diagrams for the processing of shale gas and oil sands, state what methods could be used at each step and briefly outline how you would select the best technology at each step.

2.3. Draw a diagram to demonstrate what petrochemicals can be produced from various fractions of oil sands and shale gas.

Question 3 (15 marks, 45 minutes) – Safety and Sustainability

Discuss the issues of safety and sustainability with regard to the development of a shale gas reservoir. Compare this development if it takes place in Canada versus Venezuela (see map on next page, Figure 1) using the example table below and discussing the pros and cons of each parameter listed.

	Economics	Social Impact	Environment	Safety
Shale gas				
Oil sands				

Figure 1Map for question 3