## ENRG3310: Introduction to Energy and Sustainability

Midterm I

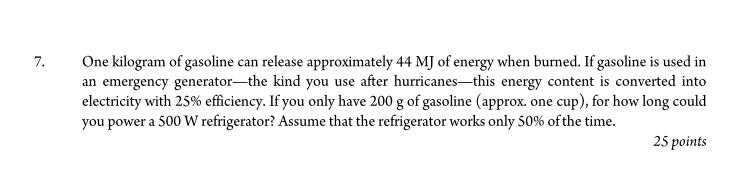
5 points

Prof. Joseph A. Pratt & Prof. Ognjen Š. Miljanić

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Name:			Student ID Number:		
	Last	First			
Read d	irections very	<u>y carefully.</u> Write your answer le	gibly in the designated spaces. Total number of points	is 150.	
1.	How is sust	ainable development defined in	Our Common Future (The Brundtland Report)?	5 points	
2.		E .	efinition of Sustainability by the Sierra Club (as discriews of the Environmental Defense Fund differ?	cussed in 5 points	
3.	(1)	ey elements of Shell's efforts to 1	reduce CO <sub>2</sub> emissions to combat climate change.	3 points	
	(2) (3) List two bus	siness ventures listed in Shell's r	eport of "Our Activities" that will increase $CO_2$ emiss	sions: 2 points	
	(1) (2)				
4.	•	•	ify two key measures used in charting the pace of these measures has shown over the last century.	~	

5.	Define the term "proved reserves" as it applies to oil.	points
6.	What public policy was used to reduce acid rain in the United States in the 1990s?	points
	Why was this important in the future efforts of the Kyoto Protocol sponsored by the United Nat reduce greenhouse gas emissions?	ion to
SHOR	AT DISCUSSION  20  What is your working definition of "sustainability"?	points
	Under your definition, do you consider the energy mix put forward by Scott Tinker in the conclus <i>Switch</i> to be sustainable? Explain and justify your opinion.  (By "energy mix" I refer to Tinker's chart at the end of <i>Switch</i> showing that by the 2060s the consumption of coal and oil could "cross" the consumption line of natural gas, nuclear, and rene energies. You might also discuss his argument that greater energy efficiency could sharply redu amount of energy needed.) <b>Continue on back if needed.</b>	global wable



8.	In 2012, US coal consumption was 430 million tonnes of oil equivalent, but dropping at a 5% annual rate. On the other hand, India consumed coal amounting to 300 million tonnes of oil equivalent, but its consumption is rising by 5% annually. In which year will India overtake the US in terms of coal					
	consumption, assuming these trends hold?	15 points				
9.	Succinctly define, in your own words, the following concepts:  Power	$4\times5$ points = 20 points				
	Watt					
	Perpetuum Mobile					
	Earth's Carbon Cycle					

10. US annual energy consumption is approximately 100 Quads (each Quad is approximately 10 <sup>18</sup> J). We is the average American's rate of energy consumption in Watts? HINT: think about the example in constant.	
with the French.	oints
<b>GROUP PROJECT PROPOSAL</b> Use the form provided on Blackboard. Almost all of you turned this in on Tuesday. 25 pc	