ENRG3310: Introduction to Energy and Sustainability **Midterm III**

Prof. Ognjen Š. Miljanić/Prof. Joseph A. Pratt May 3, 2016

Name: _____ Student ID Number: _____

Last First

Read directions very carefully. Write your answer legibly in the designated spaces. *Total number of points is 150.*

1. List five major points that should be considered in the construction of an energy efficient house, and briefly (one sentence) elaborate on each of them. *5×5 = 25 points*

#1

#2

#3

#4

#5

2. Compare and contrast environmental effects of building new solar power capacity and building new wind energy capacity. Which one, in your opinion, is "greener"?

20 points

3. Provide brief definitions of the following terms: *5×5 points = 25 points*

photovoltaics

NIMBY

flex-fuel vehicle

energy balance (in case of biofuels)

co-generation

4. Write a couple of sentences about each of the following aspects of biomass

3×10 points = 30 points

Current importance in global energy mix and potential for future growth

Undesirable environmental consequences

Desirable environmental and societal aspects

5. Sun delivers energy to the Earth at a rate of 1.74×10^{17} W. Given that Earth's diameter is 7,918 miles, calculate how many W are delivered per sqft of Earth's surface. *10 points*

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7. What do you know about lignin—the second most abundant biopolymer on Earth? *10 points*

8. In your opinion, what role will today's "alternative energy" technologies play in our energy makeup in 2040? Compare and contrast relative importance of wind, hydroelectric, solar, geothermal, and biomass energy. *20 points*