

Unit 6 - Week 4 - Energy Resources

Course outline

How does an NPTEL online course work?

Practice Assignment

Week 1 - Introduction

Week 2 - Energy and quality of life, Country energy balance

Week 3 - Energy Economics

Week 4 - Energy Resources

Lecture 7A: Energy resources- Part 1

Lecture 7B: Energy resources- Part 2

Lecture 8A: Renewable Energy Sources- Part 1

Lecture 8B: Renewable Energy Sources- Part 2

Download Videos

Weekly Feedback

Resource Model Tutorial

Quiz : Assignment 4

Assignment 4 Solutions

Week 5 - Non-Renewable Resource Economics

Week 6 - Preferences, Utility and Social choices

Week 7 - Public and private goods, Externalities

Week 8 - Energy and Financing

Week 9 - Input-Output Analysis

Week 10 - Primary Energy Analysis, Net Energy Analysis

Week 11 - Net Energy Analysis (Continued), Energy Policy

Week 12 - Energy policy (continued), Future Energy Systems

Text Transcripts

Assignment 4

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-02-26, 23:59 IST.

1) Which of the following is a correctly matched set, when it comes to natural resource classification? 1 point

- Coal - Stock, Wind - Stock, Minerals - Flow, Biomass - Stock
- Ores-Stock, Wind- Flow, Solar radiation - Flow, Corn - Flow
- Coal- Flow, Wind-Stock, Minerals - Stock, Biomass - Stock
- Coal - Stock, Wind - Stock, Solar radiation - Flow, Biomass - Stock
- Coal - Stock, Wind - Flow, Solar radiation - Stock, Biomass - Stock
- Ores-Stock, Wind-Flow, Solar radiation - Flow, Biomass - Stock

No, the answer is incorrect. Score: 0

Accepted Answers: Ores-Stock, Wind-Flow, Solar radiation - Flow, Biomass - Stock

2) The Pearl Curve is a popular model for studying and predicting stocks of fossil fuel reserves. It can analytically be expressed as $Q_p = \frac{Q_\infty}{1 + Ae^{-bt}}$, 1 point

where Q_p is the cumulative production till the year t , Q_∞ is the total proven reserve for the resource, A and b are model parameters, and t is the time, in years. The analytical expression for the peaking time (time of maximum annual production) is:

- $\frac{\ln A}{b}$
- $\ln \frac{A}{b}$
- $\frac{A}{\ln b}$
- $\ln A - b$
- $\frac{AbQ_\infty}{(1 + Ae^{-bt})^2}$

No, the answer is incorrect. Score: 0

Accepted Answers: $\ln \frac{A}{b}$

3) The solar radiation on a location is (mark all that are true) 1 point

- A combination of beam and diffuse radiation
- Constant during sunshine hours
- ranges between 1.5 to 2 kWm^{-2}
- Cannot be greater than 1.3 kWm^{-2}

No, the answer is incorrect. Score: 0

Accepted Answers: A combination of beam and diffuse radiation Cannot be greater than 1.3 kWm^{-2}

4) The biomass resource available as crop residue is 1 point

- Can be calculated using incident solar radiation
- Cannot be computed without measurements of the tree density
- Variable and uncertain and cannot be estimated
- Obtained from the area under the crop, yield and crop residue factor

No, the answer is incorrect. Score: 0

Accepted Answers: Obtained from the area under the crop, yield and crop residue factor

5) The tidal range is 1 point

- Distance between the peak tide and the average tide
- The difference in the temperature of the surface water and water at a depth of 1 km
- Distance of the coast where the effect of tides is experienced
- Difference between the high tide and low tide

No, the answer is incorrect. Score: 0

Accepted Answers: Difference between the high tide and low tide

6) Which of the following renewables is easily stored and dispatchable? 1 point

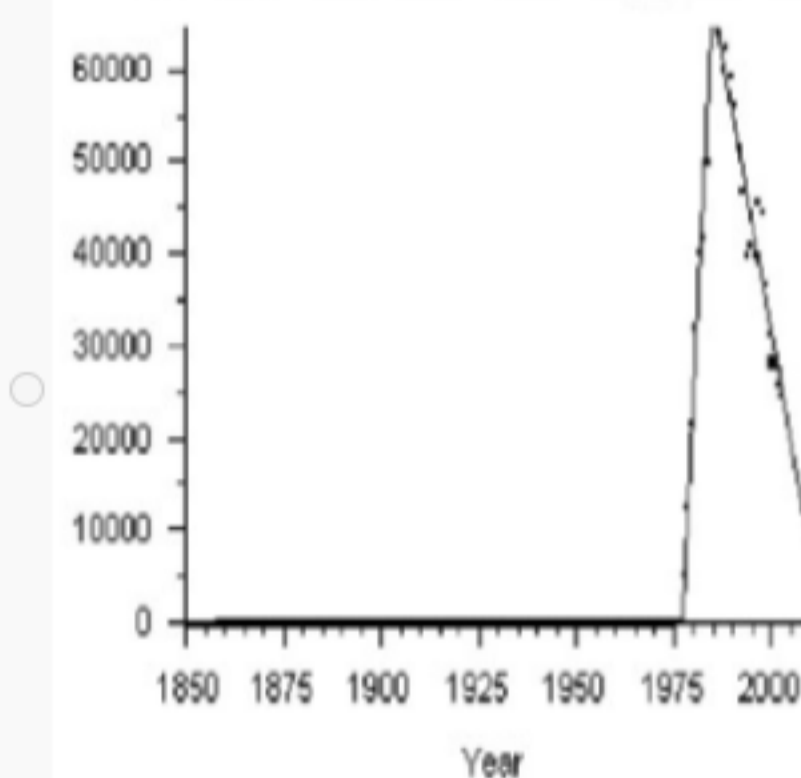
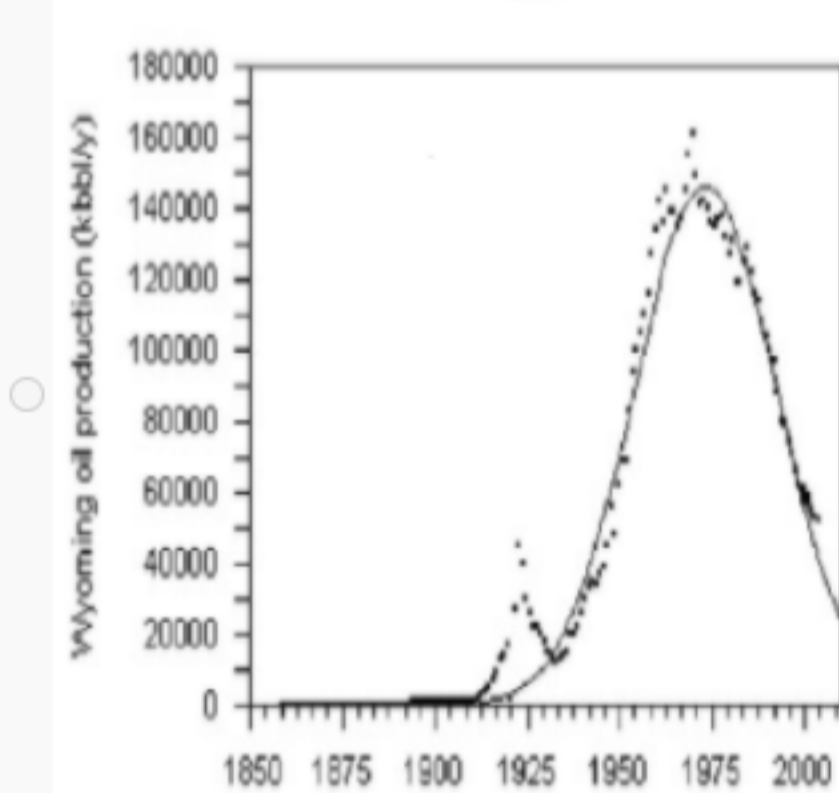
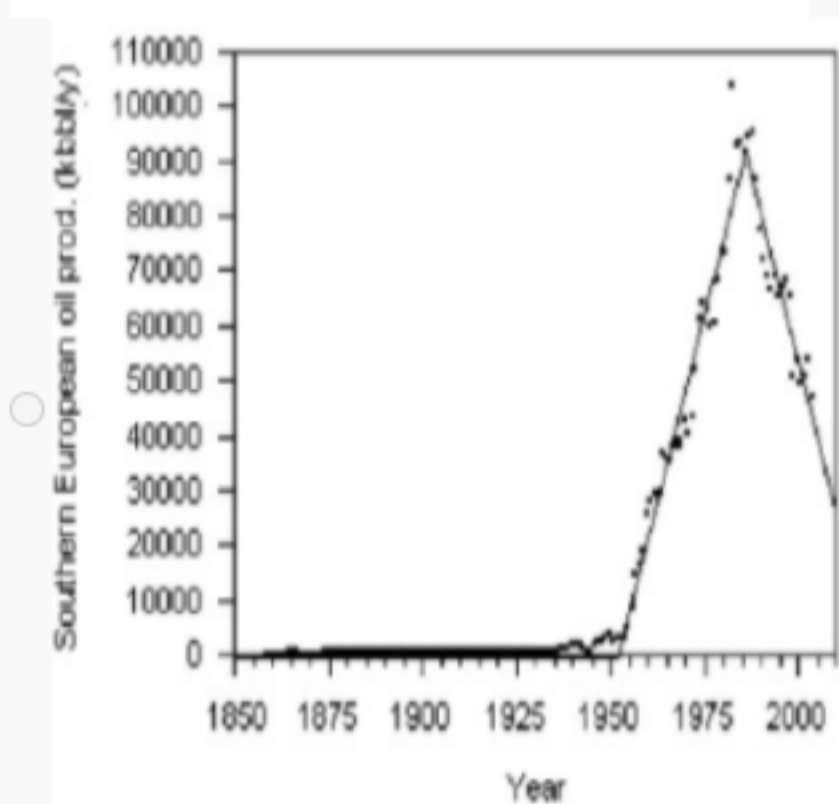
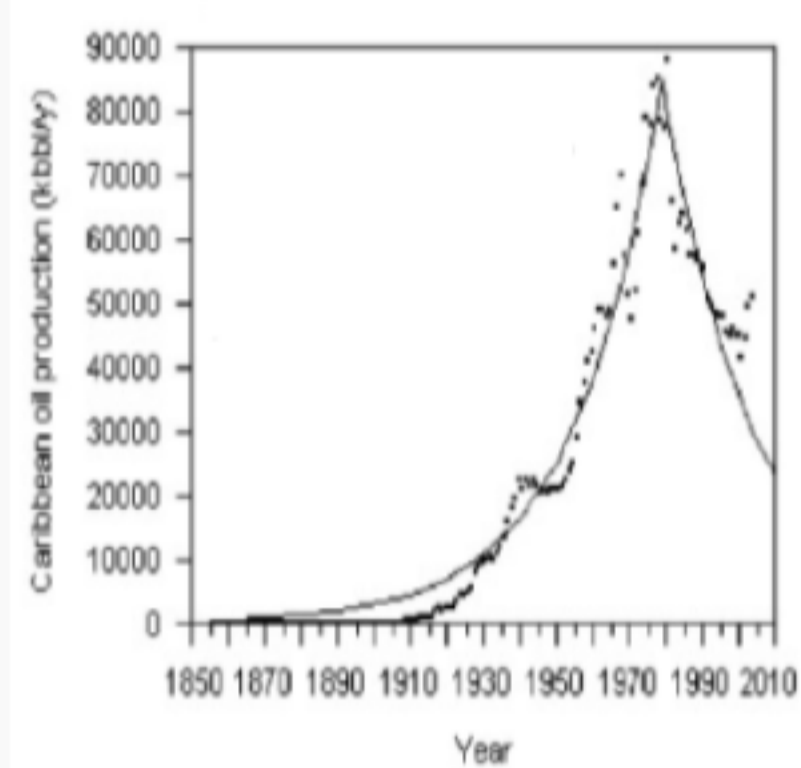
- Tidal power
- Wave energy
- Biomass energy
- Wind energy
- Solar energy

No, the answer is incorrect. Score: 0

Accepted Answers: Biomass energy

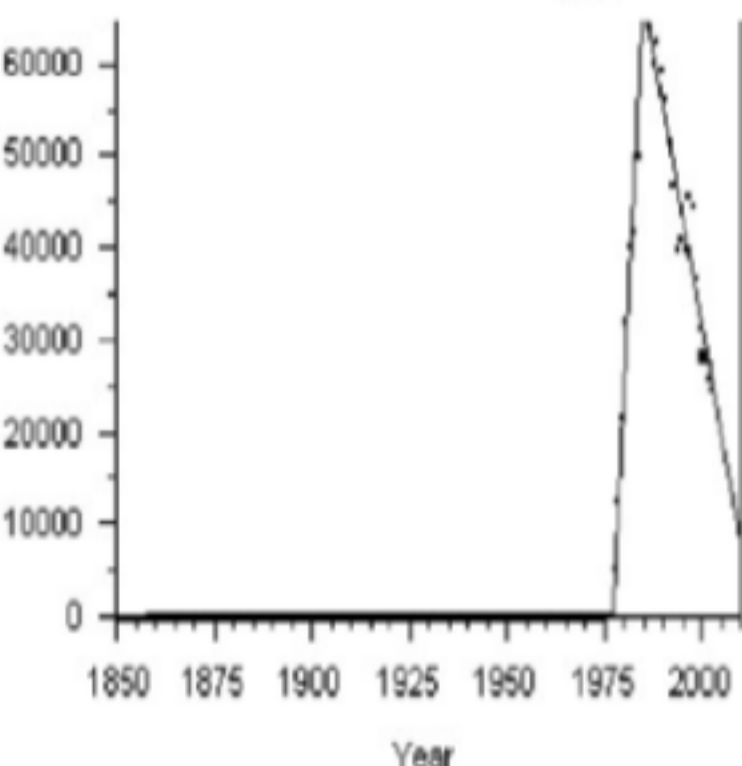
7) Which of the following plots can be fitted with an asymptotic exponential fit? 1 point

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No, the answer is incorrect. Score: 0

Accepted Answers:



8) For a country with oil reserves of 5000 million tonnes and an annual production of 200 million tonnes in 2019, calculate the static R/P ratio (in years). 1 point

Hint

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: Numeric) 25

9) It can be assumed that before the start of organic life on earth, there was no free carbon or oxygen (they would have reacted due to high temperatures). Free oxygen in the atmosphere can be assumed to exist, purely due to the carbon fixation during photosynthesis ($6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$). If the amount of oxygen in the atmosphere is equal to 10^{15} tonnes and the amount of fuels discovered is roughly equal to 10.5×10^{12} tonnes of coal equivalent, how much of the carbon reserves are yet to be discovered (in percentage)? Neglect the carbon contribution from organic life. Assume that coal contains 80 % carbon 1 point

Hint

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: Range) 95,98

10) For a country with oil reserves of 5000 million tonnes and an annual production of 200 million tonnes in 2019, and an annual production of 150 million tonnes in 2014, how many years will this oil last? 1 point

Hint

No, the answer is incorrect. Score: 0

Accepted Answers: (Type: Range) 12,15