

geo 4-1517 A

## **Tentamen: Petroleum Geology of the North Sea**

4 January, 2010

### Section A (De Jager)

#### **1 - Chalk**

- 1a Describe the reservoir characteristics of the Upper Cretaceous Chalk of the North Sea
- 1b Describe the basic elements of the Chalk Play in the Central North Sea
- 1c What are the trap types that have been observed in the Central North Sea (include sketches)?
- 1d What are the differences between oil and gas accumulations in chalk and sandstone reservoirs?

#### **2 – Norwegian Margin**

- 2a Describe the main characteristics and differences of the Draugen Platform, Halten Terrace and Vøring Basin on the Norwegian margin (include a schematic cross-section)
- 2b What are the ages of the reservoirs of the main oil and gas accumulations in each of these areas?
- 2c What are the hydrocarbon types (oil or gas) in each of these areas, and how can we explain this?

#### **3 – West Netherlands Basin**

- 3a What are the two main HC plays of the West Netherlands Basin?
- 3b Describe the main characteristics of these two plays (reservoirs – seals – source rocks – hydrocarbon types – trap types)
- 3b Explain the effect of the late Cretaceous to Early Tertiary inversion on the occurrence of oil and gas fields in the West Netherlands Basin

### Section B (Doust)

1. Contrast the types of reservoirs and traps that are characteristic of the pre-rift, syn-rift and post-rift cycles of basin evolution in the North Sea.
2. Describe the various types of rift geometries that we see in the Late Jurassic North Sea rift, and the impact that the presence or absence of salt in the pre-rift has on the structural development.

### Section C (Wong)

1. What is the future of the petroleum industry in the North Sea (please explain)?
2. What is the influence of climate on the hydrocarbon potential of the Upper Carboniferous section?
3. How did the presence of the Zuidwal volcano influence the presence of the Zuidwal gas field in the Netherlands?
4. What are the controlling factors of the development of carbonates during the Zechstein and discuss their potential for hydrocarbon accumulation.