MŰSZAKI FÖLD- ÉS KÖRNYEZETTUDOMÁNYI KAR
BÁNYÁSZAT ÉS ENERGIA INTÉZET

MISKOLCI EGYETEM
UNIVERSITY OF MISKOLC

FACULTY OF EARTH AND ENVIRONMENTAL SCIENCES AND ENGINEERING
INSTITUTE OF MINING AND ENERGY

FINAL EXAMINATION REVIEW QUESTIONS

For students of
Petroleum Engineering MSc

Reservoir Engineering Topic

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1. Question

Reservoir Engineering

Define the wettability properties of reservoir rocks, how these properties influence the recovery of hydrocarbon reservoir. Define the capillary pressure, and draw up the capillary pressure curve. How the capillary pressure can be measured?

2. Question

Reservoir Engineering

Classify the porosity of reservoir rock porosity. Give a short description of porosity measurement methods. How can you determine the subsurface area of reservoir rock?

3. Question

Reservoir Engineering

Show the applicability of Darcy’s Law for compressible and slightly compressible fluids in case of single-phase filtration. Give a detailed description of the permeability measurement procedure for gas and liquid.

4. Question

Reservoir Engineering

Define the relative permeability. Plot the relative permeability curves for water oil system. How can you measure the relative permeability. Where you can use the relative permeability data.

5. Question

Reservoir Engineering

Characterize the hydrocarbon systems (reservoirs) in the pressure temperature phase diagram. Explain the phase transformation of different type hydrocarbon systems during the pressure decrease.

6. Question

Reservoir Engineering

What is the main of water influx on the different hydrocarbon reservoirs, where is water influx advantageous and where is it a disadvantage? Explain the similarities and differences of van Everdingen-Hurst and Fetkovich's water influx calculation model.

7. Question

Reservoir Engineering

Derive the Material balance equation for different type of hydrocarbon system saturated and under saturated oil and gas and gas condensate reservoir. Explain when and what for can be used the Material Balance equation.

8. Question

Reservoir Engineering

Explain how the material balance equation can be used to determine the original hydrocarbon in place (graphical solution) and for the production forecast.

9. Question

Reservoir Engineering

Diffusivity Equation. Constant Terminal Rate and Constant-terminal Pressure solutions and their usages.

10. Question

Reservoir Engineering

Explain the frontal displacement process with Buckley Leverett and Weldge method. How the displacement efficiency can be determined with the factional curve.

11. Question

Reservoir Engineering

Fractional flow without dispersion, displacement of connate water. Polimer Flood: fractional flow diagram, saturation profile, oil production curve.

12. Question

Reservoir Engineering

Characterize miscible gas injection: How the minimum miscibility pressure can be determined. Explain miscibility condition of multi component system in trianglediagram.

Information

There is no preparation time during the final exam to develop the Questions.
The collection of formulas compiled by the Institute may be used for the final examination.

Recommended literature on topics

• Craft and Hawkins: Applied Petroleum Reservoir Engineering, Prentice Hall, 1991, ISBN 0-13-039884-5

• Towler: Fundamental Principles of Reservoir Engineering, SPE Textbook Series, Vol.8., 2002, ISBN 1-55563-092-8

• T. Ahmed: Advanced Reservoir Engineering, Gulf Publishing Co. 2005, ISBN-13: 978-0-750 6-7733-2

• T. Ahmed: Reservoir Engineering Handbook, Gulf Publishing Co., 2001, ISBN 0-88415-770-9

• L. P. Dake: Fundamentals of Reservoir Engineering, Elsevier, 1978, ISBN 0-444-41830-X

• Fanci: Principles of Applied Reservoir Simulation, Gulf Publishing Co. 2001, ISBN 0-88415-372-X

• Ertekin – AbouKassem - King: Basic Applied Reservoir Simulation, SPE Textbook Series, 2001,ISBN 1-55563-089-8

• A. Satter: Integrated Petroleum Reservoir management: A Team Approach. Pennwell Books,1994, ISBN 0-87814-408-0

• A. Satter: Computer Assisted Reservoir Management Pennwell Books, ISBN: 978-0-87814-777-9

• J. Pápay: Development of Petroleum Reservoirs, Akadémiai Kiadó, Budapest 2003. ISBN 963 05 7927 8

• János Török, Lipót Fürcht, Tibor Bódi: PVT Properties of Reservoir Fluids. (Book). University of Miskolc, Miskolc, Hungary 2012. ISBN 978-963-661-988-5 p. 1-192

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