MISKOLCI EGYETEM
UNIVERSITY OF MISKOLC

MŰSZAKI FÖLD- ÉS KÖRNYEZETTUDOMÁNYI KAR
BÁNYÁSZAT ÉS ENERGIA INTÉZET

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

MTA
KIVÁLÓ KUTATÓHELY

FINAL EXAMINATION REVIEW QUESTIONS

For students of
Petroleum Engineering MSc

Production Technology Topic

3515 Miskolc, Egyetemváros
+36 46 565 078
marietta.veresne.hriczo@uni-miskolc.hu
www.bei.uni-miskolc.hu

Petroleum Engineering MSc 06/2026

1. Question

Production Technology

Multiphase vertical pipe flow fundamentals: basic equations, flow patterns, superficial velocities, gas slippage, liquid holdup.

Petroleum Engineering MSc 06/2026

2. Question

Production Technology

Gas lift valves: main types, constructions, operations, valve setting.

Petroleum Engineering MSc 06/2026

3. Question

Production Technology

Basic design of continuous flow gas lift installations, effects of operating parameters on performance.

Petroleum Engineering MSc 06/2026

4. Question

Production Technology

Application of NODAL Analysis methods to find the liquid rate of a continuous flow gas lift well.

5. Question

Production Technology

Unloading of continuous flow gas lift wells, unloading valve string design.

6. Question

Production Technology

Problems of pumping gassy fluids, downhole gas separator types, their operational features.

7. Question

Production Technology

Fatigue endurance of sucker rods. MGD for API and non-API materials. Rod string design principles.

8. Question

Production Technology

Torsional loading of gearboxes, API torque analysis. Permissible loads, optimum counterbalancing.

9. Question

Production Technology

Components of an ESP system: constructional details, operational features of pump, motor, protector, cable, surface, and downhole miscellaneous equipment.

10. Question

Production Technology

Free gas volume at pump suction, ESP pump performance degradation, Turpin correlation. Possible solutions: motor shrouds, rotary gas separators. RGS construction, operation.

11. Question

Production Technology

ESP installation design: well inflow calculations, TDH calculation, selection of the pump.

12. Question

Production Technology

ESP installation design: selection of the motor, protector and cable.

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

• A.P. Szilas: Production and Transport of Oil and Gas. Part A., Akadémiai Kiadó, Budapest,1986.

• Takács G.: Fundamentals of Production Engineering. okt. segédlet, Miskolci Egyetem, 2005,161p.

• G. Takács: Gas Lift Manual., PennWell Corporation, Tulsa, USA. 2005. 478p, ISBN 0-87814-805-1.

• George V.Chilingarian et.al.: Surface Operations in Petroleum Production II, Elsevier, 1989

• Larry W. Lace: General Engineering, Petroleum Engineering Handbook Vol 1, SPE, 2006

• Takács G.: Sucker-rod pumping manual. Tulsa : PennWell, 2003. 395 p. ISBN 0 87814 899 2

• Production Operations Engineering, Petroleum Engineering Handbook Vol 4, SPE, 2006

• Szilas, A.P.: Production and Transport of Oil and Gas. Part B., Akadémiai Kiadó, Budapest,1986., ISBN 963-05-3363-4

• Cholet, H.: Progressing cavity pumps. Editions Technip, Paris. 1997. 112p. ISBN 2-7108-0724-6.

• Beggs, H. D.: Production Optimization Using NODAL Analysis, OGCI Publications, 2003. ISBN: 0-930972-14-7

• Takács, G.: Electrical submersible pumps manual. Elsevier, 2009. 425 p. ISBN 978 1 85617 5579.

Miskolc, 20/04/2026.

Dr. Zoltan Turzo.
Associate professor
Specialist manager