NCEES Principles and Practice of Engineering PETROLEUM Exam Specifications

Effective Beginning with the October 2007 Examinations

- The exam is an 8-hour open-book exam. It contains 40 multiple-choice questions in the 4-hour morning session, and 40 multiple-choice questions in the 4-hour afternoon session. Examinee works all questions.
- The exam uses both the International System of units (SI) and the US Customary System (USCS). Some questions may require knowledge of mathematics and physical sciences as well as relevant petroleum engineering terminology.
- The knowledge areas specified as examples of kinds of knowledge are not exclusive or exhaustive categories.
- The associated knowledge areas referred to in the specification are:
 - a. Relevant industry design standards
 - b. Relevant industry regulatory/environmental law and safety requirements
 - c. Project management techniques (e.g., costing, scheduling, contracting, logistics)
 - d. Geoscience principles (e.g., pore pressure, fracture gradients, wellbore stability)
 - e. Risk analysis/contingency planning
 - f. Surveillance/optimization techniques (e.g., data acquisition and control, modeling)
 - g. Economic principles

		Approximate Percentage of Examination
I.	 Drilling Engineering A. General Drilling Engineering 1. Casing and tubulars (e.g., collapse and burst strength, grade, connections) 2. Drilling fluids (e.g., rheology, chemistry, oil-base/water-base) 3. Drill string and BHA 4. Hydraulics (e.g., pressure drops, nozzle selection, fluid velocities) 5. Directional/horizontal drilling (e.g., motors, calculations, steering) 6. Well control/BOP (e.g., kick tolerance, methods, equipment) 7. Associated knowledge 	25% 15%
	 B. Specialized Drilling Engineering Cementing (e.g., properties, yield, placement, downhole equipment) Drilling mechanics (e.g., rock properties, drill-off test) Rig equipment capabilities Wellheads Solids control Fishing (e.g., equipment, techniques) Bits (e.g., classification, cutting, structures, grading) Underbalanced drilling (e.g., candidate selection, air, foam, equipment) Associated knowledge 	10%

II.	Pre	oduction Engineering	35%
	А.	Completion	14%
		1. Perforation (e.g., size, density, tools, methods)	
		2. Completion and work-over fluids	
		3. Well and completion systems, including nodal analysis	
		4. Innow performance curve analysis	
		6 Matrix acid treatments	
		7 Tubing and downhole equipment (e.g. zonal isolation tubing	
		movement, packers)	
		8. Associated knowledge	
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	в.	Surveillance	14%
		1. Lift mechanism selection given a set of well conditions	
		2. Sucket fou pullipling systems 2. Cas lift including intermitters, plunger lifts, or gas lift valves	
		A Downhole numps including FSPs progressing cavity numps or jet	
		4. Downlote pumps, metading ESI's, progressing cavity pumps, or jet	
		5 Production logging (e.g. pressure surveys fluid profiles cased-hole	
		logs)	
		6. Plug and abandonment procedures	
		7. Remedial/recompletion operations (e.g., squeeze cementing, sand and	
		water control)	
		8. Coiled tubing operations	
		9. Associated knowledge	
	C.	Facilities	7%
		1. Selection of piping to accommodate flow rate, total pressure, and	7 -
		pressure drop considerations	
		2. Compressor application and sizing parameters	
		3. Onsite processing equipment (e.g., separators, heater treaters,	
		dehydrators)	
		4. Onsite storage vessels, including piping, valves, and venting	
		5. Custody transfer metering devices for oil and gas (e.g., orifice meters,	
		LACT)	
		6. Produced fluid treatment (e.g., scale, asphaltenes, paraffin, corrosion)	
		7. Associated knowledge	
ш	R۵	eservoir Engineering	40%
••••	A.	General Reservoir Engineering	20%
		1. Reservoir geoscience (e.g., lithology, rock mechanics, porosity,	_0/0
		permeability, borehole stability)	
		2. Oil/gas reservoir drive mechanics	
		3. Fluid properties (e.g., phase behavior, viscosity, density)	
		4. Single/multiphase flow in porous media (e.g., wettability, mobility,	
		relative permeability)	
		5. Methods for estimating reserves and recoveries (e.g., decline analysis,	
		material balance, volumetrics)	
		6. Reservoir development techniques (e.g., well spacing, patterns, rates,	
		stimulation)	
		7. Associated Knowledge	

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- B. Specialized Reservoir Engineering
 - 1. Water/gas injection (e.g., water flood, pressure maintenance, gravity drainage)
 - 2. Enhanced oil recovery (e.g., miscible injection, chemical injection, thermal recovery)
 - 3. Fundamental reservoir numerical simulation concepts
 - 4. Analysis of tight gas reservoirs
 - 5. Associated knowledge
- C. Formation Evaluation
 - 1. Methods to determine net pay
 - 2. Log measurements (e.g., acoustic, nuclear, electrical)
 - 3. Logging methods (e.g., MWD/LWD, open hole, cased hole)
 - 4. Well testing (e.g., wireline, production test, well test analysis)
 - 5. Coring (e.g., SWC, full-hole core, petrophysical/lab analysis)
 - 6. Mud logging (e.g., gas units and analysis, cuttings analysis, ROP)
 - 7. Associated knowledge

7%