

The National Council of Examiners for Engineering and Surveying

Principles and Practice of Engineering Examination Electrical and Computer—POWER Exam Specifications

EFFECTIVE Beginning with the April 2009 Examinations

	Approximate Percentage of Examination
I. General Power Engineering	30%
A. Measurement and Instrumentation	7.5%
1. Instrument transformers	
2. Wattmeters	
3. VOM metering	
4. Insulation testing	
5. Ground resistance testing	
B. Special Applications	10%
1. Lightning and surge protection	
2. Reliability	
3. Illumination engineering	
4. Demand and energy management/calculations	
5. Engineering economics	
C. Codes and Standards	12.5%
1. National Electrical Code (NEC)	
2. National Electrical Safety Code (NESC)	
3. Electric shock and burns	
II. Circuit Analysis	20%
A. Analysis	11%
1. Three-phase circuit analysis	
2. Symmetrical components	
3. Per unit analysis	
4. Phasor diagrams	
B. Devices and Power Electronic Circuits	9%
1. Battery characteristics and ratings	
2. Power supplies	
3. Relays, switches, and PLCs	
4. Variable-speed drives	

III. Rotating Machines and Electromagnetic Devices	20%
A. Rotating machines	12.5%
1. Synchronous machines	
2. Induction machines	
3. Generator/motor applications	
4. Equivalent circuits	
5. Speed-torque characteristics	
6. Motor starting	
B. Electromagnetic Devices	7.5%
1. Transformers	
2. Reactors	
3. Testing	
IV. Transmission and Distribution (High, Medium, and Low Voltage)	30%
A. System Analysis	12.5%
1. Voltage drop	
2. Voltage regulation	
3. Power factor correction and voltage support	
4. Power quality	
5. Fault current analysis	
6. Grounding	
7. Transformer connections	
8. Transmission line models	
B. Power System Performance	7.5%
1. Power flow	
2. Load sharing: parallel generators or transformers	
3. Power system stability	
C. Protection	10%
1. Overcurrent protection	
2. Protective relaying	
3. Protective devices (e.g., fuses, breakers, reclosers)	
4. Coordination	

Notes

1. The exam is developed with questions that will require a variety of approaches and methodologies including design, analysis, and application. Some questions may require knowledge of engineering economics.
2. The knowledge areas specified under 1, 2, 3, etc., are examples of kinds of knowledge, but they are not exclusive or exhaustive categories.
3. The exam contains 80 multiple-choice questions. Examinee works all questions.