| Ethics and Professional Practice | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **6** | **5** | **3** |
| **SUBTOPICS** | Codes of ethics (professional and technical societies) | X | X | X |
| | Professional liability | X | X | X |
| | Licensure | X | | |
| | Sustainability and sustainable design | X | | |
| | Professional skills (e.g., public policy, management, and business) | X | | |
| | Contracts and contract law | X | | |
| | Agreements and contracts | | X | X |
| | Ethical and legal considerations | | X | X |
| | Public health, safety, and welfare | | X | |
| | Public protection issues (e.g., licensing boards) | | | X |

| Heat Transfer | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **0** | **14** | **12** |
| **SUBTOPICS** | Conduction | | x | x |
| | Convection | | x | x |
| | Radiation | | x | x |
| | Thermal resistance | | x | |
| | Transient processes | | x | |
| | Heat exchangers | | x | |
| | Boiling and condensation | | x | |
| | Heat transfer coefficients (e.g., overall, local, fouling) | | | x |
| | Heat transfer equipment, operation, and design (e.g., double pipe, shell and tube, fouling, number of transfer units, log-mean temperature difference, flow configuraiton) | | | x |

| Thermodynamics | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **0** | **20** | **12** |
| **SUBTOPICS** | Properties of ideal gases and pure substances | | X | |
| | Energy transfers | | X | |
| | Laws of thermodynamics | | X | X |
| | Processes | | X | |
| | Performance of components | | X | |
| | Power cycles, thermal efficiency, and enhancements | | X | |
| | Refrigeration and heat pump cycles and coefficients of performance | | X | |
| | Nonreacting mixtures of gases | | X | |
| | Psychrometrics | | X | |
| | Heating, ventilating, and air-conditioning (HVAC) processes | | X | |
| | Combustion and combustion products | | X | |
| | Thermodynamic properties (e.g. specific volume, internal energy, enthalpy, entropy, free energy) | | | X |
| | Properties data and phase diagrams (e.g. steam tables, psychrometric charts, T-s, P-h, x-y, T-x-y) | | | X |
| | Thermodynamic processes (e.g., isothermal, adiabatic, isentropic) | | | X |
| | Cyclic processes and efficiency (e.g., power, refrigeration, heat pump) | | | X |
| | Phase equilibrium (e.g., fugacity, activity coefficient) | | | X |
| | Chemical equilibrium | | | X |
| | Heats of reaction and mixing | | | X |

| Statics | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **11** | **12** | **0** |
| **SUBTOPICS** | Resultants of force systems | X | X | |
| | Equivalent force systems / Concurrent force systems | X | X | |
| | Equilibrium of rigid bodies | X | X | |
| | Frames and trusses | X | X | |
| | Centroid of area / Centroids | X | X | |
| | Area moments of inertia / Moments of Inertia | X | X | |
| | Static friction | X | X | |

| Geotechnical Engineering | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **14** | **0** | **0** |
| **SUBTOPICS** | Geology | X | | |
| | Index properties and soil classifications | X | | |
| | Phase relations (air-water-solid) | X | | |
| | Laboratory and field tests | X | | |
| | Effective stress (buoyancy) | X | | |
| | Stability of retaining walls (e.g., active pressure/passive pressure) | X | | |
| | Shear strength | X | | |
| | Bearing capacity (cohesive and noncohesive) | X | | |
| | Foundation types (e.g., spread footings, deep foundations, wall footings, mats) | X | | |
| | Consolidation and differential settlement | X | | |
| | Seepage/flow nets | X | | |
| | Slope stability (e.g., fills, embankments, cuts, dams) | X | | |
| | Soil stabilization (e.g., chemical additives, geosynthetics) | X | | |
| | Drainage systems | X | | |
| | Erosion control | X | | |

| Mathematics | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **11** | **9** | **12** |
| **SUBTOPICS** | Analytical Geometry | X | X | X |
| | Roots of Equations | X | | X |
| | Calculus | X | X | X |
| | Differential Equations | X | X | X |
| | Linear Algebra | | X | |
| | Vector Analysis | | X | |
| | Numerical Methods | | X | |

| Probability and Statistics | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **6** | **6** | **6** |
| **SUBTOPICS** | Measures of central tendencies and dispersions (e.g., mean, mode, standard deviation) | X | | X |
| | Estimation for a single mean (e.g., point, confidence intervals) | X | | X |
| | Regression and curve fitting | X | X | X |
| | Expected value (weighted average) in decision making | X | | X |
| | Probability distributions (e.g., discrete, continuous, normal, binomial) | | X | X |
| | Hypothesis testing | | | X |

| Dynamics | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **6** | **14** | **0** |
| **SUBTOPICS** | Kinematics (e.g., particles and rigid bodies) | X | X | |
| | Mass moments of inertia | X | | |
| | Force acceleration (e.g., particles and rigid bodies) | X | | |
| | Impulse momentum (e.g., particles and rigid bodies) | X | X | |
| | Work, energy, and power (e.g., particles and rigid bodies) | X | X | |
| | Kinetic friction | | X | |
| | Newton's second law (e.g., particles and rigid bodies) | | X | |
| | Kinematics of mechanisms | | X | |
| | Free and forced vibrations | | X | |

| Mechanics of Materials | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **11** | **12** | **0** |
| **SUBTOPICS** | Shear and moment diagrams | X | X | |
| | Stresses and strains (e.g., axial, torsion, bending, shear, thermal) | X | X | |
| | Deformations (e.g., axial, torsion, bending, thermal) | X | X | |
| | Combined stresses | X | X | |
| | Principal stresses | X | | |
| | Mohr's circle | X | X | |
| | Column analysis (e.g., buckling, boundary conditions) | X | X | |
| | Composite sections | X | | |
| | Elastic and plastic deformations | X | X | |
| | Stress-strain diagrams | X | X | |
| | Stress transformations | | X | |

| Fluid Mechanics / Fluid Dynamics | | CE | ME | CHE |
|---|---|---|---|---|
| | **Max # of Possible Questions for this Topic per Engineering Discipline** | **6** | **14** | **12** |
| **SUBTOPICS** | Flow measurement (e.g., orifices, Venturi meters) | X | | |
| | Fluid properties | X | X | X |
| | Fluid statics | X | X | |
| | Energy, impulse, and momentum equations | X | X | |
| | Internal flow | | X | |
| | External flow | | X | |
| | Incompressible flow | | X | |
| | Compressible flow | | X | |
| | Power and efficiency | | X | |
| | Performance curves | | X | |
| | Scaling laws for fans, pumps, and compressors | | X | |
| | Dimensionless numbers (e.g., Reynolds number) | | | X |
| | Mechanical energy balance (e.g., pipes, valves, fittings, pressure losses across packed beds, pipe networks) | | | X |
| | Bernoulli equation (hydrostatic pressure, velocity head) | | | X |
| | Laminar and turbulent flow | | | X |
| | Flow measurement (e.g., orifices, Venturi meters) | | | X |
| | Pumps, turbines, and compressors | | | X |
| | Compressible flow and non-Newtonian fluids | | | X |