Fundamentals_Engineering

FE Environmental

DAY	Topic/ Number of Questions	Knowledge Area	√	DAY	Topic/ Number of Questions	Knowledge Area	√
1	1.Mathematics5–8	A.Analytic geometry and trigonometry		47	10. Surface Water Resources and Hydrology 9–14	B. Water storage sizing (e.g., reservoir, detention and retention basins)	
2		B.Algebraic equations and roots		48	Rest	Rest	
3		C.Calculus (e.g., differential, integral, differential equations)		49	10. Surface Water Resources and Hydrology 9–14	C. Routing (e.g., channel, reservoir)	
4		D.Numerical methods (e.g., numerical integration, approximations, precisionlimits, error propagation)		50		D. Water quality and modeling (e.g., erosion, channel stability, stormwater quality management, wetlands, Streeter-Phelps, eutrophication)	
5	2.Probability and Statistics4–6	A.Measures of central tendencies and dispersions (e.g., mean, mode,standard deviation)		51		E. Water budget (e.g., evapotranspiration, precipitation, infiltration, soil moisture, storage)	
6	Rest	Rest		52	11. Groundwater, Soils, and Sediments 8–12	A. Basic hydrogeology (e.g., aquifer properties, soil characteristics, subsurface)	
7	2.Probability and Statistics4–6	B.Probability distributions (e.g., discrete, continuous, normal, binomial)		53		B. Groundwater flow (e.g., Darcy's law, specific capacity, velocity, gradient, transport mechanisms)	
8		C.Estimation for a single mean (e.g., point, confidence intervals)		54	Rest	Rest	
9		D.Regression (linear, multiple), curve fitting, and goodness of fit (e.g.,correlation coefficient, least squares)		55	11. Groundwater, Soils, and Sediments 8–12	C. Drawdown (e.g., Dupuit, Jacob, Theis, Thiem)	
10		E.Hypothesis testing (e.g., t-test, outlier testing, analysis of the variance)		56	11. Groundwater, Soils, and Sediments 8–12	D. Remediation of soil, sediment, and/or groundwater (e.g., recovery, ex-situ/in-situ treatment)	
11	3.Ethics and Professional Practice5–8	A.Codes of ethics (e.g., professional and technical societies, ethical andlegal considerations)		57	12. Water and Wastewater 12–18	A. Water and wastewater characteristics (e.g., physical, chemical, biological, nutrients)	
12	Rest	Rest		58		B. Mass balance and loading rates (e.g., removal efficiencies)	
13	3.Ethics and Professional Practice5–8	B.Public health, safety, and welfare (e.g., public protection issues, licensingboards, professional liability)		59		C. Physical processes (e.g., sedimentation/clarification, filtration, adsorption, membrane, flocculation, headworks, flow equalization, air stripping, activated carbon)	
14		C.Compliance with codes, standards, and regulations (e.g., CWA, CAA, RCRA,CERCLA, SDWA, NEPA, OSHA)		60	Rest	Rest	
15		D.Engineer's role in society (e.g., sustainability, resiliency, long-term viability)		61	12. Water and Wastewater 12–18	D. Chemical processes (e.g., disinfection, ion exchange, softening, coagulation, precipitation)	
16	4.Engineering Economics5–8	A.Time value of money (e.g., equivalence, present worth, equivalent annualworth, future worth, rate of return, annuities)		62		E. Biological processes (e.g., activated sludge, fixed film, lagoons, phytoremediation, aerobic, anaerobic, anoxic)	
17		B.Cost types and breakdowns (e.g., fixed, variable, direct and indirect labor,incremental, average, sunk, O&M)		63		F. Sludge treatment and handling (e.g., land application, digestion, sludge dewatering, composting)	
18	Rest	Rest		64		G. Water conservation and reuse	
19	4.Engineering Economics5–8	C.Economic analyses (e.g., benefit-cost, break-even, minimum cost,overhead, life cycle)		65	13. Air Quality and Control 8–12	A. Ambient and indoor air quality (e.g., criteria, toxic and hazardous air pollutants)	
20		D.Project selection (e.g., comparison of projects with unequal lives,lease/buy/make, depreciation, discounted cash flow)		66	Rest	Rest	
21	5. Fundamental Principles 7–11	A. Population projections and demand calculations (e.g., water, wastewater, solid waste, energy)		67	13. Air Quality and Control 8–12	B. Mass and energy balances (e.g., STP basis, loading rates, heating values)	
22		B. Reactors		68		C. Emissions (e.g., factors, rates)	
23		C. Materials science (e.g., properties, corrosion, compatibility, stress strain)		69		D. Atmospheric modeling and meteorology (e.g., stability classes, dispersion modeling, lapse rates)	
24	Rest	Rest		70		E. Gas treatment technologies (e.g., biofiltration, scrubbers, adsorbers, incineration, catalytic reducers)	
25	6. Environmental Chemistry 7–11	A. Stoichiometry and chemical reactions (e.g., equilibrium, acid-base, oxidation-reduction, precipitation, pC-pH)		71		F. Particle treatment technologies (e.g., baghouses, cyclones, electrostatic precipitators)	
26		B. Kinetics (e.g., chemical conversion, growth and decay)		72	Rest	Rest	
27		C. Organic chemistry (e.g., nomenclature, functional group reactions)		73	13. Air Quality and Control 8–12	G. Indoor air quality modeling and controls (e.g., air exchanges, steady- and nonsteady-state reactor model)	
28		D. Multimedia equilibrium partitioning (e.g., Henry's law, octanol partitioning coefficient)		74	14. Solid and Hazardous Waste 7–11	A. Mass and energy balances	
29	7. Health Hazards and Risk Assessment 4–6	A. Dose-response toxicity (e.g., carcinogen, noncarcinogen)		75		B. Solid waste management (e.g., collection, transportation, storage, composting, recycling, waste to energy)	
30	Rest	Rest		76		C. Solid waste disposal (e.g., landfills, leachate and gas collection)	
31	7. Health Hazards and Risk Assessment 4–6	B. Exposure routes and pathways		77		D. Hazardous waste compatibility	
32		C. Occupational health (e.g., PPE, noise pollution, safety screening)		78	Rest	Rest	
33	8. Fluid Mechanics and Hydraulics 12–18	A. Fluid statics (e.g., pressure, force analysis)		79	14. Solid and Hazardous Waste 7–11	E. Site characterization (e.g., sampling, monitoring, remedial investigation)	
34		B. Closed conduits (e.g., Darcy-Weisbach, Hazen-Williams, Moody)		80		F. Hazardous and radioactive waste treatment and disposal (e.g., physical, chemical, thermal, biological)	
35		C. Open channel (e.g., Manning, supercritical/subcritical, culverts, hydraulic elements)		81	15. Energy and Environment 4–6	A. Energy sources concepts (e.g., conventional and alternative)	
36	Rest	Rest		82		B. Environmental impact of energy sources and production (e.g., greenhouse gas production, carbon footprint, thermal, water needs)	
37	8. Fluid Mechanics and Hydraulics 12–18	D. Pumps (e.g., power, operating point, parallel, series)		83	Rest	Rest	
38		E. Flow measurement (e.g., weirs, orifices, flumes)		84	Test,Review	Test,Review	
39		F. Blowers (e.g., power, inlet/outlet pressure, efficiency, operating point, parallel, series)		85		Test,Review	
40		G. Fluid dynamics (e.g., Bernoulli, laminar flow, turbulent flow, continuity equation)		86		Test,Review	
41		H. Steady and unsteady flow		87		Test,Review	
42	Rest	Rest		88		Test,Review	
43	9. Thermodynamics 3–5	A. Thermodynamic laws (e.g., first law, second law)		89	Rest	Rest	
44		B. Energy, heat, and work (e.g., efficiencies, coefficient of performance, energy cycles, energy conversion, conduction, convection, radiation)		90	Exam	Exam	
45		C. Behavior of ideal gases		91			
46	10. Surface Water Resources and Hydrology 9–14	A. Runoff calculations (e.g., land use, land cover, time of concentration, duration, intensity, frequency, runoff control, runoff management)		92			