

Fundamentals Engineering FE Mechanical

DAY	Topic/ Number of Questions	Knowledge Area	√	DAY	Topic/ Number of Questions	Knowledge Area	√	
1	1. Mathematics 6–9	A. Analytic geometry	66	Rest	Rest			
2		B. Calculus (e.g., differential, integral, single-variable, multivariable)	67	9. Material Properties and Processing 7–11	G. Phase diagrams, phase transformation, and heat treating			
3		C. Ordinary differential equations (e.g., homogeneous, nonhomogeneous, Laplace transforms)	68		H. Materials selection			
4		D. Linear algebra (e.g., matrix operations, vector analysis)	69		I. Corrosion mechanisms and control			
5		E. Numerical methods (e.g., approximations, precision limits, error propagation, Taylor's series, Newton's method)	70		J. Failure mechanisms (e.g., thermal failure, fatigue, fracture, creep)			
6	Rest	Rest	71	10. Fluid Mechanics 10–15	A. Fluid properties			
7	1. Mathematics 6–9	F. Algorithm and logic development (e.g., flowcharts, pseudocode)	72	Rest	Rest			
8	2. Probability and Statistics 4–6	A. Probability distributions (e.g., normal, binomial, empirical, discrete, continuous)	73	10. Fluid Mechanics 10–15	B. Fluid statics			
9		B. Measures of central tendencies and dispersions (e.g., mean, mode, standard deviation, confidence intervals)	74		C. Energy, impulse, and momentum			
10		C. Expected value (weighted average) in decision making	75		D. Internal flow			
11		D. Regression (linear, multiple), curve fitting, and goodness of fit (e.g., correlation coefficient, least squares)	76		E. External flow			
12	Rest	Rest	77		F. Compressible flow (e.g., Mach number, isentropic flow relationships, normal shock)			
13	3. Ethics and Professional Practice 4–6	A. Codes of ethics (e.g., NCEES Model Law, professional and technical societies, ethical and legal considerations)	78		Rest	Rest		
14		B. Public health, safety, and welfare	79	10. Fluid Mechanics 10–15	G. Power and efficiency			
15		C. Intellectual property (e.g., copyright, trade secrets, patents, trademarks)	80		H. Performance curves			
16		D. Societal considerations (e.g., economic, sustainability, life-cycle analysis, environmental)	81		I. Scaling laws for fans, pumps, and compressors			
17	4. Engineering Economics 4–6	A. Time value of money (e.g., equivalence, present worth, equivalent annual worth, future worth, rate of return, annuities)	82	11. Thermodynamics 10–15	A. Properties of ideal gases and pure substances			
18	Rest	Rest	83		B. Energy transfers			
19	4. Engineering Economics 4–6	B. Cost types and breakdowns (e.g., fixed, variable, incremental, average, sunk)	84	Rest	Rest			
20	5. Electricity and Magnetism 5–8	C. Economic analyses (e.g., cost-benefit, break-even, minimum cost, overhead, life cycle)	85	11. Thermodynamics 10–15	C. Laws of thermodynamics			
21		A. Electrical fundamentals (e.g., charge, current, voltage, resistance, power, energy, magnetic flux)	86		D. Processes			
22		B. DC circuit analysis (e.g., Kirchhoff's laws, Ohm's law, series, parallel)	87		E. Performance of components			
23		C. AC circuit analysis (e.g., resistors, capacitors, inductors)	88		F. Power cycles			
24	Rest	Rest	89		G. Refrigeration and heat pump cycles			
25	5. Electricity and Magnetism 5–8	D. Motors and generators	90		Rest	Rest		
26	6. Statics 9–14	A. Resultants of force systems	91	11. Thermodynamics 10–15	H. Nonreacting mixtures of gases			
27		B. Concurrent force systems	92		I. Psychrometrics			
28		C. Equilibrium of rigid bodies	93		J. Heating, ventilation, and air-conditioning (HVAC) processes			
29		D. Frames and trusses	94		K. Combustion and combustion products			
30	Rest	Rest	95		12. Heat Transfer 7–11	A. Conduction		
31	6. Statics 9–14	E. Centroids and moments of inertia	96		Rest	Rest		
32		F. Static friction	97	12. Heat Transfer 7–11	B. Convection			
33	7. Dynamics, Kinematics, and Vibrations 10–15	A. Kinematics of particles	98		C. Radiation			
34		B. Kinetic friction	99		D. Transient processes			
35		C. Newton's second law for particles	100		E. Heat exchangers			
36	Rest	Rest	101	13. Measurements, Instrumentation, and Controls 5–8	A. Sensors and transducers			
37	7. Dynamics, Kinematics, and Vibrations 10–15	D. Work-energy of particles	102	Rest	Rest			
38		E. Impulse-momentum of particles	103	13. Measurements, Instrumentation, and Controls 5–8	B. Control systems (e.g., feedback, block diagrams)			
39		F. Kinematics of rigid bodies	104		C. Dynamic system response			
40		G. Kinematics of mechanisms	105		D. Measurement uncertainty (e.g., error propagation, accuracy, precision, significant figures)			
41	Rest	H. Newton's second law for rigid bodies	106	14. Mechanical Design and Analysis 10–15	A. Stress analysis of machine elements			
42		Rest	107		B. Failure theories and analysis			
43	7. Dynamics, Kinematics, and Vibrations 10–15	I. Work-energy of rigid bodies	108	Rest	Rest			
44		J. Impulse-momentum of rigid bodies	109	14. Mechanical Design and Analysis 10–15	C. Deformation and stiffness			
45		K. Free and forced vibrations	110		D. Springs			
46	8. Mechanics of Materials 9–14	A. Shear and moment diagrams	111		E. Pressure vessels and piping			
47		B. Stress transformations and Mohr's circle	112		F. Bearings			

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DAY	Topic/ Number of Questions	Knowledge Area	√	DAY	Topic/ Number of Questions	Knowledge Area	√
48	Rest	Rest		113		G. Power screws	
49		C. Stress and strain caused by axial loads		114	Rest	Rest	
50		D. Stress and strain caused by bending loads		115		H. Power transmission	
51	8. Mechanics of Materials 9–14	E. Stress and strain caused by torsional loads		116	14. Mechanical Design and Analysis 10–15	I. Joining methods (e.g., welding, adhesives, mechanical fasteners)	
52		F. Stress and strain caused by shear		117		J. Manufacturability (e.g., limits, fits)	
53		G. Stress and strain caused by temperature changes		118		K. Quality and reliability	
54	Rest	Rest		119		L. Components (e.g., hydraulic, pneumatic, electromechanical)	
55		H. Combined loading		120	Rest	Rest	
56	8. Mechanics of Materials 9–14	I. Deformations		121	14. Mechanical Design and Analysis 10–15	M. Engineering drawing interpretations and geometric dimensioning and tolerancing (GD&T)	
57		J. Column buckling		122	Rest	Rest	
58		K. Statically indeterminate systems		123		Test, Review	
59	9. Material Properties and Processing 7–11	A. Properties (e.g., chemical, electrical, mechanical, physical, thermal)		124		Test, Review	
60	Rest	Rest		125	Test, Review	Test, Review	
61		B. Stress-strain diagrams		126		Test, Review	
62	9. Material Properties and Processing 7–11	C. Ferrous metals		127		Test, Review	
63		D. Nonferrous metals		128	Rest	Rest	
64		E. Engineered materials (e.g., composites, polymers)		129	Exam	Exam	
65		F. Manufacturing processes					

