

Computer Science

Easy Level

1. **Question:** What does HTML stand for?
 - A) Hyper Text Markup Language
 - B) High Text Markup Language
 - C) Hyperlink and Text Markup Language
 - D) None of the above**Answer:** A) Hyper Text Markup Language
2. **Question:** Which of the following is a programming language?
 - A) HTML
 - B) CSS
 - C) Python
 - D) SQL**Answer:** C) Python
3. **Question:** What is the main function of an operating system?
 - A) Run applications
 - B) Manage hardware resources
 - C) Provide security
 - D) All of the above**Answer:** D) All of the above
4. **Question:** In C++, what is the correct way to declare an integer variable?
 - A) `int 1x;`
 - B) `int x;`
 - C) `integer x;`
 - D) `int x();`**Answer:** B) `int x;`
5. **Question:** Which of the following is a correct statement in Python?
 - A) `print "Hello, World!"`
 - B) `print("Hello, World!")`
 - C) `echo "Hello, World!"`
 - D) `printf("Hello, World!")`**Answer:** B) `print("Hello, World!")`

Medium Level

1. **Question:** What is the average-case time complexity of a binary search?
 - A) $O(n)$
 - B) $O(\log n)$
 - C) $O(n \log n)$
 - D) $O(1)$**Answer:** B) $O(\log n)$
2. **Question:** Which of the following sorting algorithms has the worst-case time complexity of $O(n^2)$?
 - A) Merge Sort
 - B) Quick Sort
 - C) Bubble Sort
 - D) Heap Sort**Answer:** C) Bubble Sort

3. **Question:** In the context of databases, what does SQL stand for?
- A) Structured Query Language
 - B) Simple Query Language
 - C) Sequential Query Language
 - D) Standard Query Language
- Answer:** A) Structured Query Language
4. **Question:** What is the primary purpose of a linked list?
- A) Store elements sequentially
 - B) Provide constant time access to elements
 - C) Allow dynamic memory allocation
 - D) Sort elements efficiently
- Answer:** C) Allow dynamic memory allocation
5. **Question:** Which of the following protocols is used for email transmission?
- A) HTTP
 - B) FTP
 - C) SMTP
 - D) SNMP
- Answer:** C) SMTP

High Level

1. **Question:** What is the time complexity of finding the shortest path in an unweighted graph using BFS?
- A) $O(V + E)$
 - B) $O(V^2)$
 - C) $O(E \log V)$
 - D) $O(V \log V)$
- Answer:** A) $O(V + E)$
2. **Question:** In a network, what does the term "bandwidth" refer to?
- A) The range of frequencies
 - B) The maximum data transfer rate
 - C) The number of users connected
 - D) The latency of the connection
- Answer:** B) The maximum data transfer rate
3. **Question:** Which of the following is a necessary condition for a deadlock?
- A) Mutual Exclusion
 - B) Hold and Wait
 - C) No Preemption
 - D) All of the above
- Answer:** D) All of the above
4. **Question:** What is the purpose of a hash function in data structures?
- A) To encrypt data
 - B) To store data efficiently
 - C) To ensure data integrity
 - D) To map data of arbitrary size to fixed-size values
- Answer:** D) To map data of arbitrary size to fixed-size values
5. **Question:** Which algorithm is used to find a minimum spanning tree?
- A) Dijkstra's Algorithm
 - B) Prim's Algorithm
 - C) Bellman-Ford Algorithm

- D) Kruskal's Algorithm

Answer: B) Prim's Algorithm (or D) Kruskal's Algorithm)

Mechanical Engineering

Easy Level

1. **Question:** What is the unit of mass in the SI system?

- A) Pound
- B) Kilogram
- C) Gram
- D) Newton

Answer: B) Kilogram

2. **Question:** What does the term "work" refer to in physics?

- A) Energy stored
- B) Force applied over distance
- C) Mass times velocity
- D) None of the above

Answer: B) Force applied over distance

3. **Question:** The primary function of a flywheel is to:

- A) Store kinetic energy
- B) Regulate speed
- C) Absorb shock
- D) Control temperature

Answer: A) Store kinetic energy

4. **Question:** In a hydraulic system, which law is applied to determine the force?

- A) Archimedes' Principle
- B) Pascal's Law
- C) Bernoulli's Principle
- D) Newton's Law

Answer: B) Pascal's Law

5. **Question:** What is the unit of pressure?

- A) Joule
- B) Pascal
- C) Watt
- D) Newton

Answer: B) Pascal

Medium Level

1. **Question:** The second law of thermodynamics is related to:

- A) Conservation of mass
- B) Efficiency of energy transfer
- C) Heat transfer
- D) None of the above

Answer: B) Efficiency of energy transfer

2. **Question:** Which type of stress is experienced by a material subjected to tension?

- A) Shear stress

- B) Compressive stress
 - C) Tensile stress
 - D) Bending stress
- Answer:** C) Tensile stress
3. **Question:** What is the primary purpose of a heat exchanger?
- A) To separate materials
 - B) To transfer heat between two fluids
 - C) To increase pressure
 - D) To filter impurities
- Answer:** B) To transfer heat between two fluids
4. **Question:** The term "kinematic viscosity" is defined as:
- A) Dynamic viscosity divided by density
 - B) Density divided by dynamic viscosity
 - C) The ratio of inertial forces to viscous forces
 - D) None of the above
- Answer:** A) Dynamic viscosity divided by density
5. **Question:** The energy conversion efficiency of a Carnot engine depends on:
- A) The type of fuel
 - B) The temperature of the hot and cold reservoirs
 - C) The size of the engine
 - D) The pressure of the working fluid
- Answer:** B) The temperature of the hot and cold reservoirs

High Level

1. **Question:** The critical speed of a rotating shaft is primarily affected by:
- A) The diameter and length of the shaft
 - B) The material properties
 - C) The load applied
 - D) The speed of rotation
- Answer:** A) The diameter and length of the shaft
2. **Question:** The term "moment of inertia" is related to:
- A) The distribution of mass
 - B) The velocity of an object
 - C) The force applied
 - D) The energy stored
- Answer:** A) The distribution of mass
3. **Question:** In finite element analysis (FEA), the term "mesh" refers to:
- A) A material used for analysis
 - B) The discretization of a structure into elements
 - C) The boundary conditions applied
 - D) None of the above
- Answer:** B) The discretization of a structure into elements
4. **Question:** The Euler-Bernoulli beam theory is primarily used to analyze:
- A) Fluid flow
 - B) Bending of beams
 - C) Heat transfer
 - D) Vibration of structures
- Answer:** B) Bending of beams
5. **Question:** The efficiency of an Otto cycle depends on:

- A) Compression ratio
 - B) Heat addition
 - C) Type of fuel used
 - D) Ambient temperature
- Answer:** A) Compression ratio
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Electrical Engineering

Easy Level

1. **Question:** The unit of current is:
 - A) Volt
 - B) Ohm
 - C) Ampere
 - D) Watt

Answer: C) Ampere
2. **Question:** Which device is used to measure voltage?
 - A) Ammeter
 - B) Voltmeter
 - C) Ohmmeter
 - D) Wattmeter

Answer: B) Voltmeter
3. **Question:** Ohm's Law states that:
 - A) $V = I \times R$
 - B) $V = I / R$
 - C) $V = R / I$
 - D) $V = I + R$

Answer: A) $V = I \times R$
4. **Question:** A circuit is said to be in series if:
 - A) The components are connected end to end
 - B) The components share the same voltage
 - C) The components can be removed without breaking the circuit
 - D) None of the above

Answer: A) The components are connected end to end
5. **Question:** Which component stores electrical energy in an electric field?
 - A) Resistor
 - B) Inductor
 - C) Capacitor
 - D) Diode

Answer: C) Capacitor

Medium Level

1. **Question:** In an AC circuit, the impedance is a combination of:
 - A) Resistance and capacitance
 - B) Resistance and inductance
 - C) Resistance, capacitance, and inductance

- D) None of the above
Answer: C) Resistance, capacitance, and inductance
- 2. **Question:** The primary function of a transformer is to:
 - A) Convert AC to DC
 - B) Increase or decrease voltage
 - C) Store electrical energy
 - D) Measure electrical parameters**Answer:** B) Increase or decrease voltage
- 3. **Question:** What is the power factor in an AC circuit?
 - A) The ratio of real power to apparent power
 - B) The ratio of voltage to current
 - C) The ratio of inductive to capacitive reactance
 - D) None of the above**Answer:** A) The ratio of real power to apparent power
- 4. **Question:** What does the term "synchronous speed" refer to in an AC motor?
 - A) The speed at which the rotor rotates
 - B) The speed at which the magnetic field rotates
 - C) The speed at which current flows
 - D) None of the above**Answer:** B) The speed at which the magnetic field rotates
- 5. **Question:** Which of the following is a type of electrical machine?
 - A) Inductor
 - B) Capacitor
 - C) Transformer
 - D) Resistor**Answer:** C) Transformer

High Level

1. **Question:** The Thevenin equivalent circuit consists of:
 - A) A voltage source and a resistor
 - B) A current source and a resistor
 - C) Two resistors in series
 - D) None of the above**Answer:** A) A voltage source and a resistor
2. **Question:** In power systems, what does the term "load flow" analysis refer to?
 - A) The analysis of current in a circuit
 - B) The calculation of power distribution
 - C) The measurement of voltage drop
 - D) None of the above**Answer:** B) The calculation of power distribution
3. **Question:** The frequency of a signal is defined as:
 - A) The time period of the signal
 - B) The number of cycles per second
 - C) The amplitude of the signal
 - D) None of the above**Answer:** B) The number of cycles per second
4. **Question:** In control systems, a PID controller consists of:
 - A) Proportional, Integral, and Derivative actions
 - B) Phase, Input, and Delay actions

- C) Power, Inductance, and Distribution actions
- D) None of the above

Answer: A) Proportional, Integral, and Derivative actions

5. **Question:** What is the primary function of a synchronous condenser?

- A) To generate power
- B) To improve power factor
- C) To convert DC to AC
- D) None of the above

Answer: B) To improve power factor

Civil Engineering

Easy Level

1. **Question:** What is the primary function of a foundation?

- A) To support the structure
- B) To enhance aesthetics
- C) To distribute loads
- D) A and C

Answer: D) A and C

2. **Question:** Which of the following materials is commonly used in concrete?

- A) Steel
- B) Wood
- C) Sand
- D) Both A and C

Answer: D) Both A and C

3. **Question:** What does the term "load-bearing wall" refer to?

- A) A wall that is non-structural
- B) A wall that supports weight from above
- C) A decorative wall
- D) None of the above

Answer: B) A wall that supports weight from above

4. **Question:** The standard unit of length in construction is:

- A) Meter
- B) Foot
- C) Inch
- D) All of the above

Answer: A) Meter

5. **Question:** The primary purpose of a drainage system is to:

- A) Supply water
- B) Remove excess water
- C) Store water
- D) Filter water

Answer: B) Remove excess water

Medium Level

1. **Question:** What is the purpose of a retaining wall?

- A) To provide aesthetic value
 - B) To support vertical loads
 - C) To hold back soil or water
 - D) To allow water to flow
- Answer:** C) To hold back soil or water
2. **Question:** In structural analysis, what does the term "shear force" refer to?
- A) The force causing bending
 - B) The force causing axial loading
 - C) The force causing sliding between two sections
 - D) None of the above
- Answer:** C) The force causing sliding between two sections
3. **Question:** The term "moment" in mechanics is defined as:
- A) Force multiplied by distance
 - B) Mass times acceleration
 - C) Weight divided by area
 - D) None of the above
- Answer:** A) Force multiplied by distance
4. **Question:** What is the primary factor in determining the stability of a structure?
- A) Material properties
 - B) Load conditions
 - C) Design geometry
 - D) All of the above
- Answer:** D) All of the above
5. **Question:** The modulus of elasticity measures:
- A) A material's ability to deform under stress
 - B) A material's resistance to shear
 - C) The compressive strength of a material
 - D) The thermal expansion of a material
- Answer:** A) A material's ability to deform under stress

High Level

1. **Question:** The stiffness of a beam is defined as:
- A) The ratio of applied load to deflection
 - B) The ratio of deflection to applied load
 - C) The load per unit length
 - D) None of the above
- Answer:** A) The ratio of applied load to deflection
2. **Question:** In soil mechanics, the term "effective stress" is given by:
- A) Total stress minus pore water pressure
 - B) Total stress plus pore water pressure
 - C) Shear stress plus normal stress
 - D) None of the above
- Answer:** A) Total stress minus pore water pressure
3. **Question:** The principle of superposition is applied in structural analysis to:
- A) Determine the combined effect of multiple loads
 - B) Simplify complex structures
 - C) Analyze dynamic loads
 - D) None of the above
- Answer:** A) Determine the combined effect of multiple loads

4. **Question:** The moment of inertia for a rectangle about its neutral axis is:
- A) $bh^2/12$
 - B) $bh^3/12$
 - C) $bh^3/3$
 - D) $bh^2/3$
- Answer:** B) $bh^3/12$
5. **Question:** In the context of fluid mechanics, Bernoulli's equation relates:
- A) Pressure, velocity, and height
 - B) Mass, volume, and temperature
 - C) Density, area, and flow rate
 - D) None of the above
- Answer:** A) Pressure, velocity, and height
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Chemical Engineering

Easy Level

1. **Question:** What is the primary purpose of a distillation column?
- A) To mix chemicals
 - B) To separate liquid mixtures based on boiling points
 - C) To cool down liquids
 - D) To store chemicals
- Answer:** B) To separate liquid mixtures based on boiling points
2. **Question:** The unit of pressure is:
- A) Joule
 - B) Pascal
 - C) Watt
 - D) Mole
- Answer:** B) Pascal
3. **Question:** In a chemical reaction, the reactants are:
- A) Substances produced
 - B) Substances consumed
 - C) None of the above
 - D) The same as products
- Answer:** B) Substances consumed
4. **Question:** Which of the following is a common unit for measuring flow rate?
- A) m/s
 - B) m^3/s
 - C) kg/s
 - D) All of the above
- Answer:** D) All of the above
5. **Question:** What is the primary function of a heat exchanger?
- A) To mix substances
 - B) To transfer heat between two fluids
 - C) To cool a fluid
 - D) To store energy
- Answer:** B) To transfer heat between two fluids

Medium Level

1. **Question:** The term "reactor" in chemical engineering refers to:
 - A) A vessel where chemical reactions occur
 - B) A device that stores chemicals
 - C) A system for separating mixtures
 - D) None of the above**Answer:** A) A vessel where chemical reactions occur
2. **Question:** What does the term "mass transfer" refer to?
 - A) The movement of mass from one location to another
 - B) The mixing of different substances
 - C) The chemical reaction between substances
 - D) None of the above**Answer:** A) The movement of mass from one location to another
3. **Question:** The Arrhenius equation relates:
 - A) Temperature and pressure
 - B) Reaction rate and temperature
 - C) Concentration and volume
 - D) None of the above**Answer:** B) Reaction rate and temperature
4. **Question:** In a continuous stirred-tank reactor (CSTR), the reactants are:
 - A) Added continuously
 - B) Batch-wise added
 - C) Removed continuously
 - D) A and C**Answer:** D) A and C
5. **Question:** The term "enthalpy" refers to:
 - A) The total energy of a system
 - B) The energy required to start a reaction
 - C) The heat content of a system
 - D) Both A and C**Answer:** D) Both A and C

High Level

1. **Question:** The Le Chatelier's principle states that:
 - A) A system at equilibrium will not change
 - B) A system will shift to counteract any changes imposed on it
 - C) The rate of reaction is always constant
 - D) None of the above**Answer:** B) A system will shift to counteract any changes imposed on it
2. **Question:** What is the purpose of a batch reactor?
 - A) To continuously process reactants
 - B) To process a fixed quantity of reactants
 - C) To store reactants
 - D) To heat reactants**Answer:** B) To process a fixed quantity of reactants
3. **Question:** In fluid dynamics, what does the Reynolds number indicate?
 - A) The temperature of a fluid
 - B) The type of flow (laminar or turbulent)

- C) The pressure drop in a system
- D) The viscosity of a fluid

Answer: B) The type of flow (laminar or turbulent)

4. **Question:** What is the main advantage of using a packed bed in a reactor?

- A) Increased surface area for reactions
- B) Reduced pressure drop
- C) Easier temperature control
- D) None of the above

Answer: A) Increased surface area for reactions

5. **Question:** The first law of thermodynamics states that:

- A) Energy cannot be created or destroyed
- B) Entropy always increases
- C) Heat flows from hot to cold
- D) None of the above

Answer: A) Energy cannot be created or destroyed