1. Explain the difference between analog and digital signals.
2. What are the key components of a basic communication system? Describe their functions.
3. Draw a block diagram of an AM (Amplitude Modulation) transmitter and explain each block.
4. Illustrate the block diagram of a superheterodyne receiver and describe its working principle.
5. Draw the circuit diagram of an RC (Resistor-Capacitor) low-pass filter and explain its operation.
6. Illustrate and explain the working of a PN-junction diode in forward and reverse bias conditions.
7. Explain Newton's three laws of motion.
8. What is the difference between speed and velocity?
9. Draw a block diagram of a basic RLC circuit and explain each component.
10. Illustrate the block diagram of a transformer and describe its working principle.
11. Draw and explain the free-body diagram of an object in uniform circular motion.
12. Illustrate and explain the working of a PN-junction diode in forward and reverse bias conditions.
13. Describe the differences between covalent, ionic, and metallic bonds.
14. What are the key properties of acids and bases?
15. Draw the block diagram of an electrochemical cell and explain its components.
16. Illustrate the block diagram of a distillation apparatus and describe its working.
17. Draw the Lewis structure of methane (CH₄) and explain its bonding.
18. Illustrate and explain the process of fractional distillation using a diagram.
19. What are the main stages of the cell cycle?
20. Describe the structure and function of DNA.
21. Draw a block diagram of the human digestive system and explain its parts.
22. Illustrate the block diagram of a neuron and describe its structure.
23. Draw the structure of a typical animal cell and explain the functions of its organelles.
24. Illustrate and explain the process of photosynthesis using a diagram.
25. Explain the fundamental theorem of calculus.
26. What is the difference between a permutation and a combination?
27. Draw a block diagram of a polynomial function and explain its key features.
28. Illustrate the block diagram of a linear regression model and describe its components.
29. Draw and explain the graph of the sine function.
30. Illustrate and explain the process of solving a quadratic equation using the quadratic formula.
31. Explain the difference between procedural and object-oriented programming.
32. What are the key features of a relational database?
33. Draw a block diagram of the architecture of a computer system and explain each component.
34. Illustrate the block diagram of a TCP/IP model and describe its layers.
35. Draw the flowchart for a binary search algorithm and explain its steps.
36. Illustrate and explain the process of a merge sort algorithm using a diagram.