A) Arithmetic Operators (+, -, *, /, //, %, **)

1. Add two numbers.
2. Subtract one number from another.
3. Multiply two numbers.
4. Divide two numbers (floating point).
5. Floor divide two numbers.
6. Find the remainder of two numbers.
7. Find the square of a number.
8. Find the cube of a number.
9. Calculate the power of a number without using math.pow().
10. Find the area of a rectangle (length × width).
11. Find the perimeter of a square.
12. Convert minutes into seconds using multiplication.
13. Convert kilometers to meters.
14. Calculate the average of N numbers.
15. Calculate the compound interest using the formula.

B) Assignment Operators (=, +=, -=, *=, /=, //=, %=, **=)

16. **Add a number to an existing variable using +=.**
17. **Subtract a number from an existing variable using -=.**
18. **Multiply a variable by a number using *=.**
19. **Divide a variable by a number using /=.**
20. **Floor divide a variable by a number using //=.**
21. **Take a number and find its modulus using %=.**
22. **Take a number and raise it to a power using **=.**
23. **Start with x=10 and apply all assignment operators step by step.**
24. **Swap two variables without using a third variable using += and -=.**
25. **Demonstrate difference between a=a+b and a+=b with lists.**

C) Comparison Operators (==, !=, >, <, >=, <=)

26. **Check if two numbers are equal.**
27. **Check if two numbers are not equal.**

28. Check if one number is greater than the other.
29. Check if one number is less than the other.
30. Check if one number is greater than or equal to the other.
31. Check if one number is less than or equal to the other.
32. Compare two strings alphabetically.
33. Compare lengths of two strings.
34. Check if two variables store the same integer value.
35. Check if temperature is greater than 30°C.

D) Logical Operators (and, or, not)

36. Check if a number is divisible by both 3 and 5 using and.
37. Check if a number is divisible by 3 or 5 using or.
38. Check if a number is not divisible by 2 using not.
39. Check if a person is eligible for voting (age ≥ 18 and citizen = True).

40. Check if a student passes (marks ≥ 40 and attendance ≥ 75).
41. Check if a password is strong (length ≥ 8 and contains a digit).
42. Check if a person is eligible for gym membership (age ≥ 16 or student = True).
43. Check if a number is positive and even.
44. Check if a number is negative or odd.
45. Check if a number is not between 10 and 20.

E) Bitwise Operators (&, |, ^, ~, <<, >>)

46. Perform bitwise AND of two numbers.
47. Perform bitwise OR of two numbers.
48. Perform bitwise XOR of two numbers.
49. Perform bitwise NOT of a number.
50. Left shift a number by 1.
51. Right shift a number by 1.
52. Check if the 3rd bit in a number is set.
53. Swap two numbers using bitwise XOR.
54. Check if a number is even or odd using bitwise AND.

55. Multiply a number by 4 using left shift.

F) Membership Operators (in, not in)

56. Check if a character exists in a string.
57. Check if a word exists in a sentence.
58. Check if an element exists in a list.
59. Check if an element exists in a tuple.
60. Check if a key exists in a dictionary.
61. Check if a value exists in a dictionary.
62. Check if a letter does not exist in a string.
63. Search if "Python" exists in a given paragraph.
64. Check if number 5 is in a given range list.
65. Check if "@" exists in an email string.

G) Identity Operators (is, is not)

66. Check if two variables refer to the same object in memory.
67. Check if two lists with same elements have same memory reference.
68. Check if None is None.

69. Check if two variables do not refer to the same object.

70. Show difference between == and is for strings.

71. Show difference between == and is for lists.

72. Check if two variables are exactly same object.

73. Check if two integers with same value have same memory reference.

74. Compare small integers using is.

75. Compare large integers using is.
