1. When Resistors are Connected in Series:

When resistors are connected in series, the equivalent resistance (Req) is the sum of the individual resistances.

Req_series = R1 + R2
Req_series = 6Ω + 12Ω
Req_series = 18Ω

In a series connection, the current flowing through each resistor is the same. Therefore, I_series = I = 1A (given).

To find the voltage (V_series) across the series connection, we can use Ohm's Law:

V_series = I_series * Req_series
V_series = 1A * 18Ω
V_series = 18V

So, when the resistors are connected in series, the equivalent resistance (Req_series) is 18Ω, and the voltage (V_series) is 18V.

2. When Resistors are Connected in Parallel:

When resistors are connected in parallel, the reciprocal of the equivalent resistance (Req) is the sum of the reciprocals of the individual resistances.

1/Req_parallel = 1/R1 + 1/R2
1/Req_parallel = 1/6Ω + 1/12Ω
1/Req_parallel = (2 + 1) / 12Ω
1/Req_parallel = 3 / 12Ω
Req_parallel = 12Ω / 3
Req_parallel = 4Ω

In a parallel connection, the voltage across each resistor is the same. Therefore, V_parallel = V = 1A (given).

To find the current (I_parallel) flowing through the parallel connection, we can use Ohm's Law:

I_parallel = V_parallel / Req_parallel
I_parallel = 1A / 4Ω
I_parallel = 0.25A

So, when the resistors are connected in parallel, the equivalent resistance (Req_parallel) is 4Ω, and the current (I_parallel) is 0.25A.

In summary:
- Series connection: Equivalent Resistance (Req_series) = 18Ω, Voltage (V_series) = 18V
- Parallel connection: Equivalent Resistance (Req_parallel) = 4Ω, Current (I_parallel) = 0.25A