2024 Ph H1 Q18

Section: Electricity

Topic: Current, PD, Power, Resistance

Question Summary
A 12 V supply of negligible internal resistance is connected across a 60 Ω resistor in series with a parallel combination of 20 Ω and 30 Ω resistors. Find the potential difference across the 60 Ω resistor.

Worked Solution
Parallel: R_p = (20 × 30) / (20 + 30) = 600 / 50 = 12 Ω.
Total resistance: R_T = 60 + 12 = 72 Ω.
Circuit current: I = V / R = 12 / 72 = 0.167 A.
Voltage across 60 Ω: V = IR = 0.167 × 60 ≈ 10 V.

Final Answer: E

Revision Tips

- When solving, always reduce parallel parts before adding series parts.
- Voltage across a resistor in series = I × R, where I is the total current.
- Double-check by using the voltage divider formula.