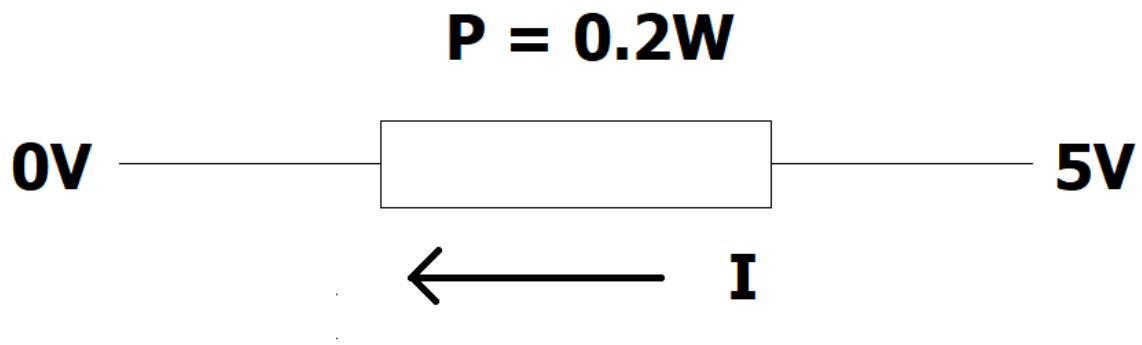
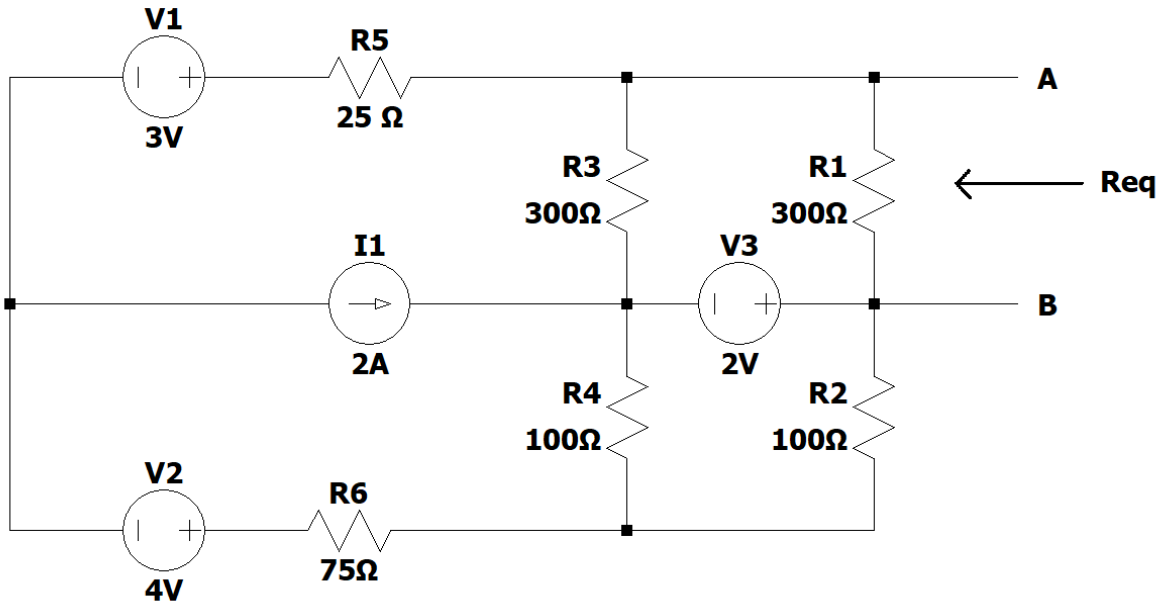
ECE 20001
Spring 2021
Exam 1 (8:30 AM)

1. A device consumes 0.2 W power at 5V DC. How much charge flows through the wiring during a 10 second interval?



A. 0.4 C
B. 1.0 C
C. 0.1 C
D. 0.2 C
E. 0.5 C
F. 0.6 C
G. 0.7 C
H. None of the Above

2. What is the equivalent resistance as seen from port AB?



A. 50 Ω

B. 100 Ω

C. 75 Ω

D. 20 Ω

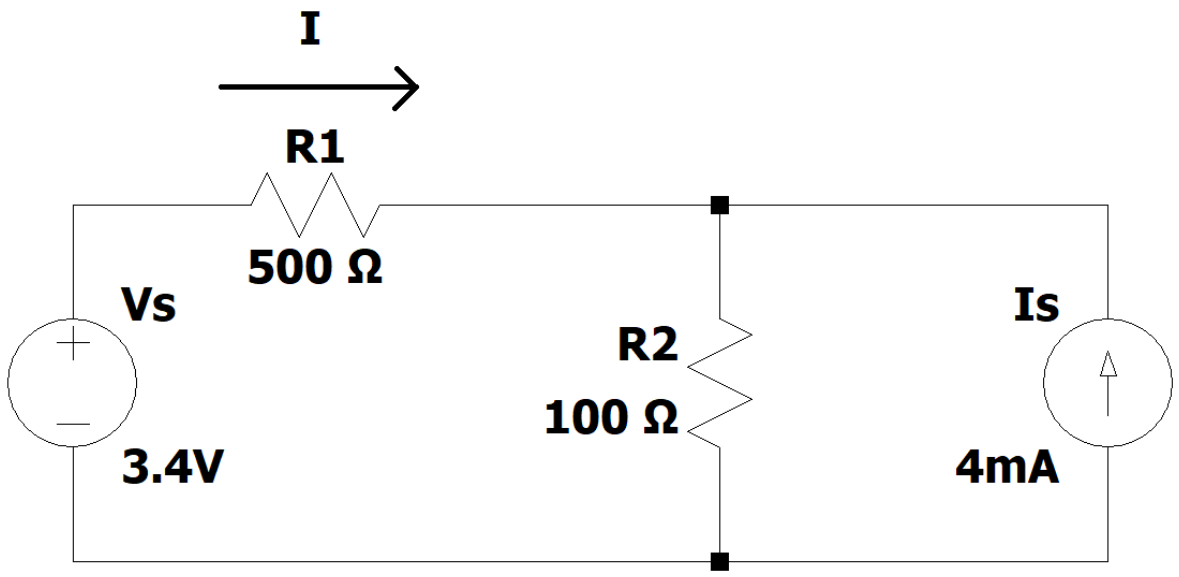
E. 125 Ω

F. 40 Ω

G. 150 Ω

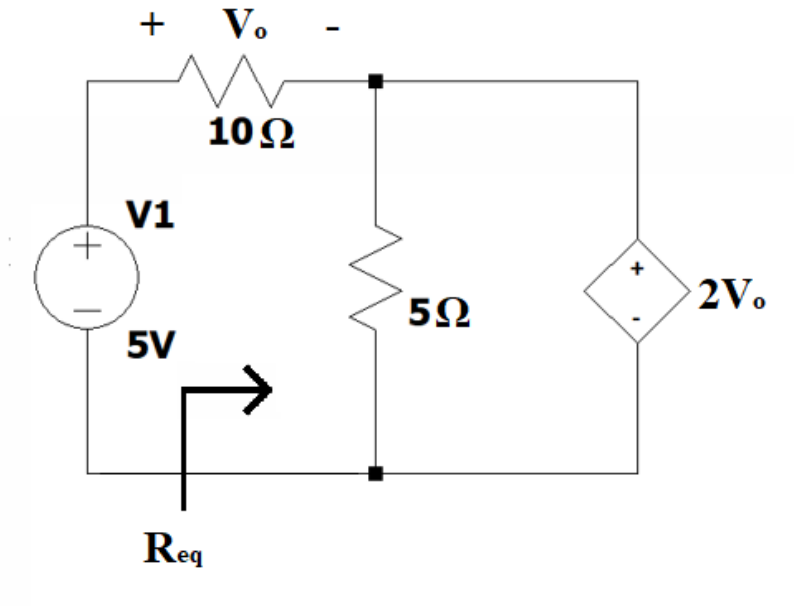
H. None of the Above

3. Find I, the current traveling through R1.



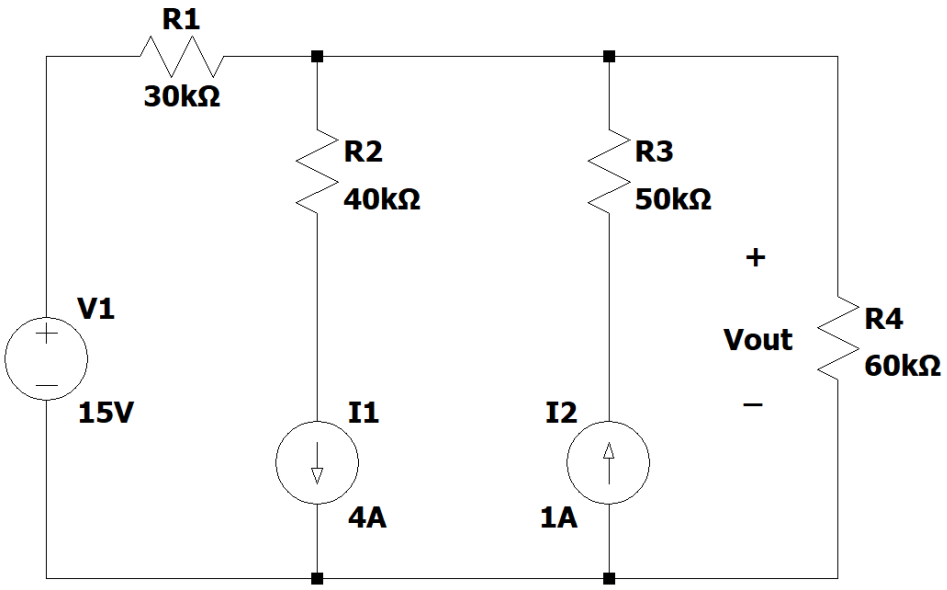
A. 7.7 mA
B. -4.2 mA
C. 10.0 mA
D. 5.0 mA
E. 4 mA
F. -4 mA
G. -5 mA
H. 6.8 mA

4. Solve for R_{eq} as seen by the independent voltage source.



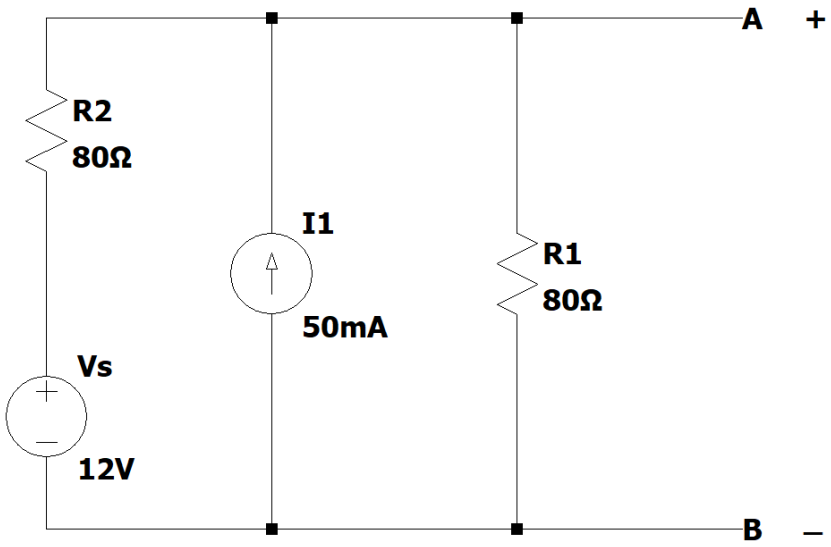
A. 5.33 Ω
B. 30.0 Ω
C. 15.0 Ω
D. 3.33 Ω
E. 10.0 Ω
F. 33.3 Ω
G. 20.0 Ω
H. None of the above

5. How much would the voltage V_{out} decrease if the source V1 were turned off? (Hint: Find the contribution of V1).



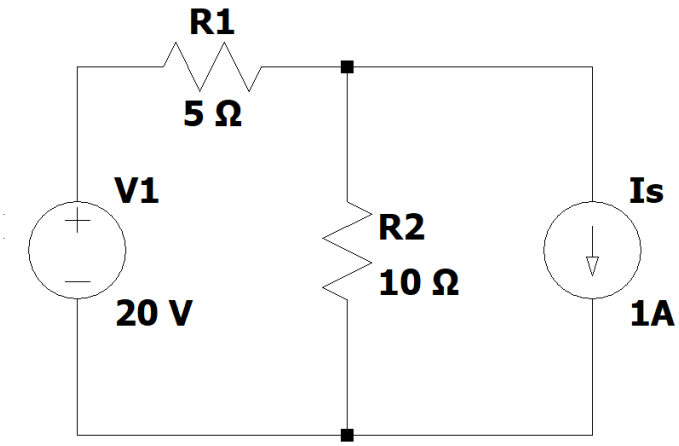
A. 9.00 V
B. 10.0 V
C. 8.18 V
D. -5.00 V
E. 15.0 V
F. -15.0 V
G. -10.0 V
H. None of the above

6. Find the Thevenin equivalent circuit as seen by terminals **A** and **B**.



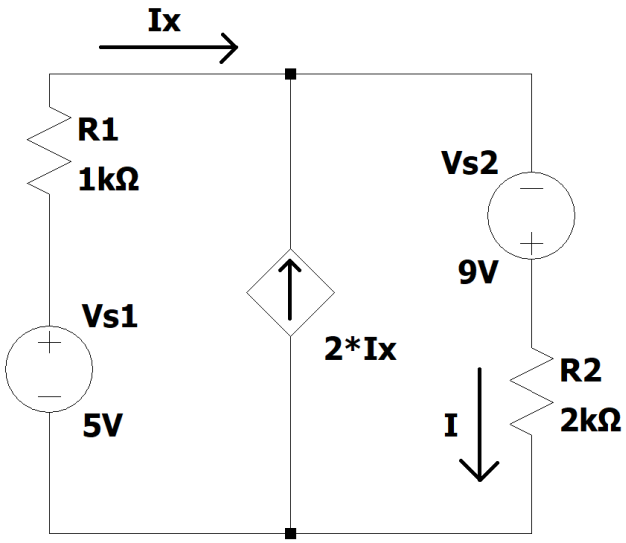
A. V_{th} = 12 V; R_{th} = 40 Ω
B. V_{th} = 6 V; R_{th} = 160 Ω
C. V_{th} = 40 V; R_{th} = 60 Ω
D. V_{th} = 8 V; R_{th} = 160 Ω
E. V_{th} = 8 V; R_{th} = 40 Ω
F. V_{th} = 12 V; R_{th} = 80 Ω
G. V_{th} = 6 V; R_{th} = 80 Ω
H. None of the above

7. Find the power consumed by the 10 Ω resistor.



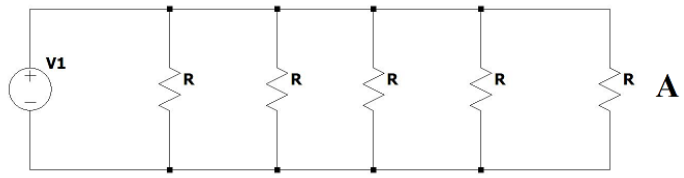
A. 200 W
B. 100 W
C. 50 W
D. 1 W
E. 20 W
F. 10 W
G. 40 W
H. None of the above

8. Find the value of the current I.

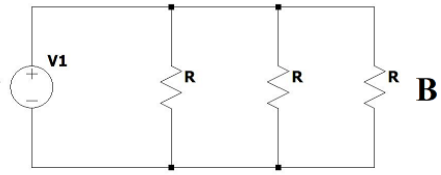


A. 2.0 mA
B. 5.3 mA
C. 6.0 mA
D. 4.2 mA
E. 5.0 mA
F. -2.0 mA
G. -4.2 mA
H. None of the above

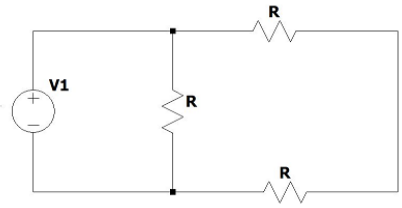
9. If all resistors and sources are the same, in which circuit does the source deliver the least power?



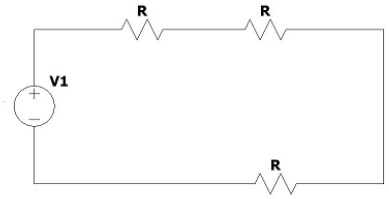
A



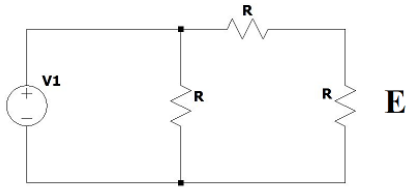
B



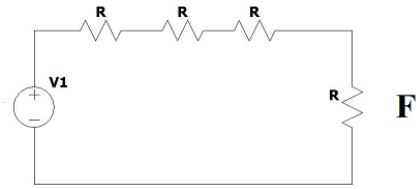
C



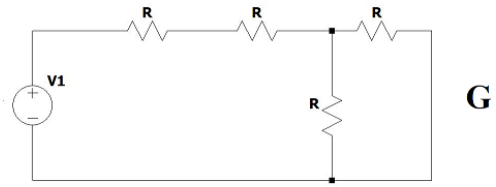
D



E



F



G

H: The source always delivers the same power

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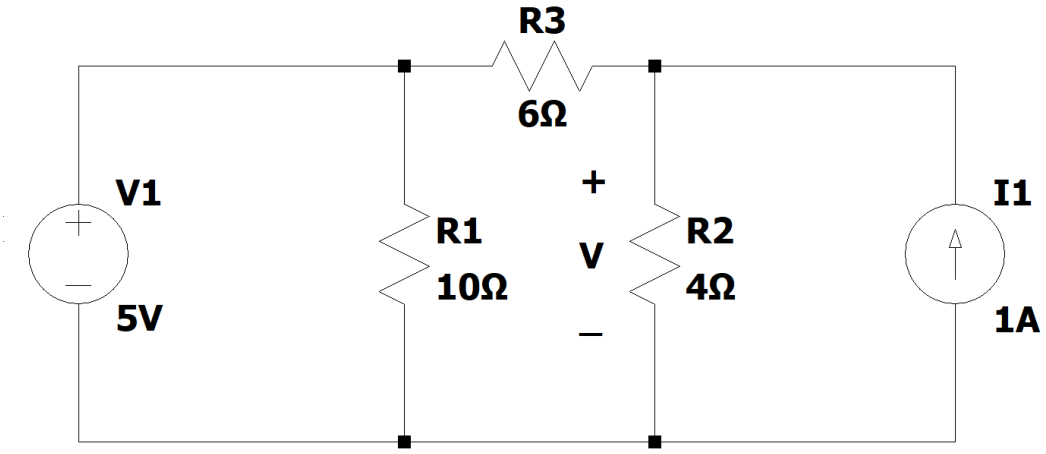
10. Find the voltage V across R2.



A. 5.0 V
B. 0.6 V
C. 1.0 V
D. 3.2 V
E. 4.4 V
F. – 5.0 V
G. -1.0 V
H. None of the above