

Parallel Resistors MCQs with Answers

KSEB Sub Engineer Exam | 30 Questions | Electrical Engineering | Prepared by Entri

Quick formulas to remember

Parallel: $1/R = 1/R_1 + 1/R_2 + \dots$ | Two resistors: $R = R_1 R_2 / (R_1 + R_2)$ | n equal: R / n

Same voltage in all | $I = I_1 + I_2 + \dots$ | Current divider: $I_1 = I \times R_2 / (R_1 + R_2)$ | $P = V^2/R$

Instructions: Choose the correct option for each question. Attempt all 30 questions first, then check the answer key and explanations at the end. Try to finish within 20 minutes.

Section A: Questions

Q1. The _____ is the same across all resistors connected in parallel.

- (a) current
- (b) power
- (c) resistance
- (d) voltage

Q2. The equivalent resistance R of resistors in parallel is given by:

- (a) $1/R = 1/R_1 + 1/R_2 + 1/R_3$
- (b) $R = R_1 + R_2 + R_3$
- (c) $R = R_1 \times R_2 \times R_3$
- (d) $R = R_1 - R_2$

Q3. The total current in a parallel circuit is:

- (a) the average of the branch currents
- (b) equal to the largest branch current
- (c) the sum of the branch currents
- (d) zero

Q4. In a parallel circuit, the current through each branch is:

- (a) directly proportional to its resistance
- (b) inversely proportional to its resistance
- (c) independent of its resistance
- (d) proportional to the square of its resistance

Q5. The equivalent resistance of resistors in parallel is always:

- (a) greater than the largest resistor
- (b) equal to the average resistance
- (c) equal to the sum of the resistances
- (d) less than the smallest resistor

Q6. The equivalent resistance of two resistors R1 and R2 in parallel is:

- (a) $R_1 + R_2$
- (b) $R_1 R_2 / (R_1 + R_2)$
- (c) $(R_1 + R_2) / (R_1 R_2)$
- (d) $R_1 - R_2$

Q7. Resistors of $6\ \Omega$ and $12\ \Omega$ are connected in parallel. The equivalent resistance is:

- (a) $18\ \Omega$
- (b) $9\ \Omega$
- (c) $4\ \Omega$
- (d) $2\ \Omega$

Q8. Five resistors of $10\ \Omega$ each are connected in parallel. The equivalent resistance is:

- (a) $50\ \Omega$
- (b) $2\ \Omega$
- (c) $10\ \Omega$
- (d) $5\ \Omega$

Q9. Resistors of $20\ \Omega$ and $30\ \Omega$ are connected in parallel. The equivalent resistance is:

- (a) $50\ \Omega$
- (b) $25\ \Omega$
- (c) $10\ \Omega$
- (d) $12\ \Omega$

Q10. Resistors of $2\ \Omega$, $3\ \Omega$ and $6\ \Omega$ are connected in parallel. The equivalent resistance is:

- (a) $11\ \Omega$
- (b) $1\ \Omega$
- (c) $0.5\ \Omega$
- (d) $6\ \Omega$

Q11. A $12\ \text{V}$ source is connected across $4\ \Omega$ and $6\ \Omega$ resistors in parallel. The total current is:

- (a) $2.4\ \text{A}$
- (b) $1\ \text{A}$
- (c) $5\ \text{A}$
- (d) $10\ \text{A}$

Q12. In the same circuit ($12\ \text{V}$ across $4\ \Omega$ and $6\ \Omega$ in parallel), the current in the $6\ \Omega$ branch is:

- (a) $2\ \text{A}$
- (b) $3\ \text{A}$
- (c) $5\ \text{A}$
- (d) $12\ \text{A}$

Q13. In a parallel circuit, the resistor that dissipates the maximum power is the one with:

- (a) the largest resistance
- (b) the smallest resistance
- (c) all resistors dissipate equal power
- (d) the middle resistance

Q14. A 12 V source is connected across 4 Ω and 6 Ω resistors in parallel. The total power dissipated is:

- (a) 24 W
- (b) 36 W
- (c) 60 W
- (d) 14.4 W

Q15. Three bulbs of 40 W, 60 W and 100 W, all rated for 230 V, are connected in parallel across 230 V. Which bulb glows brightest?

- (a) 40 W bulb
- (b) 60 W bulb
- (c) All glow equally
- (d) 100 W bulb

Q16. If one resistor in a parallel circuit burns out (open circuit), then:

- (a) the other branches continue to work and the total current decreases
- (b) all branches stop working
- (c) the total current increases
- (d) the voltage becomes zero

Q17. When another resistor is added in parallel to a circuit, the total resistance:

- (a) decreases
- (b) increases
- (c) remains unchanged
- (d) becomes infinite

Q18. If a parallel combination is short-circuited, the current becomes:

- (a) zero
- (b) very large
- (c) half
- (d) unchanged

Q19. A current of 10 A divides between 2 Ω and 3 Ω resistors in parallel. The current through the 2 Ω resistor is:

- (a) 4 A
- (b) 2 A
- (c) 6 A
- (d) 10 A

Q20. Two resistors in parallel have a resistance ratio of 1 : 2. A total current of 9 A flows. The current in the smaller resistor is:

- (a) 6 A
- (b) 3 A
- (c) 4.5 A
- (d) 2 A

Q21. Two parallel branches have conductances of 0.2 S and 0.3 S. The equivalent resistance is:

- (a) 2 Ω
- (b) 0.5 Ω
- (c) 5 Ω
- (d) 0.2 Ω

Q22. Household appliances are connected in parallel because:

- (a) each appliance gets the full supply voltage and works independently
- (b) it increases the total resistance
- (c) it reduces the current drawn
- (d) it saves energy

Q23. A voltmeter is connected in parallel across the element and should have:

- (a) very high resistance in series
- (b) very low resistance
- (c) very high resistance
- (d) resistance equal to the element

Q24. An ammeter has an internal resistance of $99\ \Omega$ and a full-scale current of 10 mA. To measure up to 1 A, the shunt resistance needed is:

- (a) $99\ \Omega$
- (b) $0.1\ \Omega$
- (c) $10\ \Omega$
- (d) $1\ \Omega$

Q25. Two equal resistors of value R are connected in parallel. The equivalent resistance is:

- (a) $2R$
- (b) $R / 2$
- (c) R
- (d) R squared

Q26. A $3\ \Omega$ and a $6\ \Omega$ resistor in parallel are connected in series with a $4\ \Omega$ resistor. The total resistance is:

- (a) $4\ \Omega$
- (b) $5\ \Omega$
- (c) $13\ \Omega$
- (d) $6\ \Omega$

Q27. Two resistors in parallel have an equivalent resistance of $3\ \Omega$. If one is $6\ \Omega$, the other is:

- (a) $3\ \Omega$
- (b) $9\ \Omega$
- (c) $6\ \Omega$
- (d) $2\ \Omega$

Q28. A $1\ \Omega$ resistor is connected in parallel with a $1000\ \Omega$ resistor. The equivalent resistance is:

- (a) $1000\ \Omega$
- (b) $500\ \Omega$
- (c) $0.5\ \Omega$
- (d) just under $1\ \Omega$

Q29. In a parallel circuit, a $5\ \Omega$ branch carries 4 A. The current in a $10\ \Omega$ branch is:

- (a) 8 A
- (b) 2 A
- (c) 4 A
- (d) 0.5 A

Q30. A $12\ \Omega$ wire is cut into 3 equal pieces, and the pieces are connected in parallel. The equivalent resistance is:

- (a) $1.33\ \Omega$
- (b) $36\ \Omega$
- (c) $4\ \Omega$
- (d) $12\ \Omega$

Section B: Answer Key

1 - (d)	2 - (a)	3 - (c)	4 - (b)	5 - (d)
6 - (b)	7 - (c)	8 - (b)	9 - (d)	10 - (b)
11 - (c)	12 - (a)	13 - (b)	14 - (c)	15 - (d)
16 - (a)	17 - (a)	18 - (b)	19 - (c)	20 - (a)
21 - (a)	22 - (a)	23 - (c)	24 - (d)	25 - (b)
26 - (d)	27 - (c)	28 - (d)	29 - (b)	30 - (a)

Section C: Answers with Explanations

Q1. Answer: (d) voltage

All parallel branches are connected between the same two nodes, so they have the same voltage.

Q2. Answer: (a) $1/R = 1/R_1 + 1/R_2 + 1/R_3$

In parallel, the reciprocals of the resistances add.

Q3. Answer: (c) the sum of the branch currents

This follows from Kirchhoff's Current Law at the node.

Q4. Answer: (b) inversely proportional to its resistance

$I = V / R$ with the same V , so a smaller resistance carries a larger current.

Q5. Answer: (d) less than the smallest resistor

Every extra parallel path reduces the total resistance.

Q6. Answer: (b) $R_1 R_2 / (R_1 + R_2)$

Product over sum: $R = R_1 \times R_2 / (R_1 + R_2)$.

Q7. Answer: (c) $4\ \Omega$

$R = (6 \times 12) / (6 + 12) = 72 / 18 = 4\ \Omega$.

Q8. Answer: (b) $2\ \Omega$

For n equal resistors in parallel, $R = 10 / 5 = 2\ \Omega$.

Q9. Answer: (d) $12\ \Omega$

$R = (20 \times 30) / (20 + 30) = 600 / 50 = 12\ \Omega$.

Q10. Answer: (b) $1\ \Omega$

$1/R = 1/2 + 1/3 + 1/6 = 3/6 + 2/6 + 1/6 = 1$, so $R = 1\ \Omega$.

Q11. Answer: (c) $5\ \text{A}$

Branch currents are $12 / 4 = 3\ \text{A}$ and $12 / 6 = 2\ \text{A}$. Total = $5\ \text{A}$.

Q12. Answer: (a) $2\ \text{A}$

$I = V / R = 12 / 6 = 2\ \text{A}$.

Q13. Answer: (b) the smallest resistance

$P = V^2 / R$ with the same V , so the smallest resistance dissipates the most power.

Q14. Answer: (c) 60 W

$P = 144 / 4 + 144 / 6 = 36 \text{ W} + 24 \text{ W} = 60 \text{ W}$. The total power is the sum of the individual powers.

Q15. Answer: (d) 100 W bulb

Each bulb gets its rated voltage, so each dissipates its rated power. The 100 W bulb is brightest.

Q16. Answer: (a) the other branches continue to work and the total current decreases

Each branch is an independent path, so the other branches are unaffected, but the total current falls.

Q17. Answer: (a) decreases

A new parallel path always lowers the equivalent resistance.

Q18. Answer: (b) very large

A short circuit gives almost zero resistance, so the current becomes very large and can damage the circuit.

Q19. Answer: (c) 6 A

Current divider: $I = 10 \times 3 / (2 + 3) = 6 \text{ A}$. The 3Ω resistor carries 6 A.

Q20. Answer: (a) 6 A

Currents are in the inverse ratio 2 : 1, so the smaller resistor carries $9 \times 2 / 3 = 6 \text{ A}$.

Q21. Answer: (a) 2 Ω

$G_{\text{total}} = 0.2 + 0.3 = 0.5 \text{ S}$, so $R = 1 / 0.5 = 2 \Omega$.

Q22. Answer: (a) each appliance gets the full supply voltage and works independently

In parallel, each appliance gets the supply voltage, and switching one off does not affect the others.

Q23. Answer: (c) very high resistance

A high-resistance voltmeter draws very little current and does not disturb the circuit.

Q24. Answer: (d) 1 Ω

$R_{\text{sh}} = I_m \times R_m / (I - I_m) = 0.01 \times 99 / 0.99 = 1 \Omega$.

Q25. Answer: (b) $R / 2$

$R \times R / (R + R) = R / 2$.

Q26. Answer: (d) 6 Ω

3Ω in parallel with $6 \Omega = 2 \Omega$. Total = $2 + 4 = 6 \Omega$.

Q27. Answer: (c) 6 Ω

$1/3 = 1/6 + 1/R$, so $1/R = 1/6$ and $R = 6 \Omega$.

Q28. Answer: (d) just under 1 Ω

$R = 1000 / 1001 = 0.999 \Omega$. In parallel, a very large resistor hardly changes the total.

Q29. Answer: (b) 2 A

$V = 4 \times 5 = 20 \text{ V}$ across every branch, so $I = 20 / 10 = 2 \text{ A}$.

Q30. Answer: (a) 1.33 Ω

Each piece is 4Ω . Three 4Ω resistors in parallel give $4 / 3 = 1.33 \Omega$.

Score check: 26 to 30 - Excellent | 20 to 25 - Good, revise weak topics | Below 20 - Revise parallel circuits, the current divider rule and power in resistors, then retry.

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