Electrical Technology
Know the method.

GRADE 12 • 2026 • DBE/CAPS

Free starter pack

3 worked methods • 3 practice questions • explained answers

Choose only the track you study. State the applicable equation or logic rule, substitute values with units and explain circuit behaviour. These are paper exercises; practical work and PAT require the school supervised procedure.

Use this pack actively

1. Choose a method from the clickable index. Try the worked question before reading its steps.

2. Complete Your turn, then follow its answer link. Correct your first error and retry without copying.

3. Mix methods and use complete official papers to practise unfamiliar contexts and time management.

Choose your specialisation. Shared foundations and three clearly named tracks are included. These tracks are NOT Papers 1, 2 and 3. A learner studies one specialisation.

Original practice, not reproduced or predicted DBE exam questions. The fuller pack supports the R99 offer. Editorial draft: independent subject-teacher moderation is still required. Selected core methods do not replace the full syllabus, practical preparation or PAT.

Question-method index

Click a method to open it. Each practice question links to its explained answer.

Power Systems

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Electronics

MR-ET-09 | Inverting amplifier gain • p. 5

Digital Electronics

MR-ET-14 | Build a logic truth table • p. 6

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Your examination map

Written examination • 180 min • 200 marks

Choose your specialisation: Power Systems, Electronics or Digital Electronics. Each has its own 200-mark written examination. The tracks below are alternatives, not separate Paper 1, Paper 2 or Paper 3 examinations.

Plan time from the actual instructions

Written examination: reserving 15 minutes leaves about 0.82 minutes per mark. Use this only as a planning guide.

PAT is a separate assessment component. Use the current official PAT instructions and your teacher deadlines. This pack does not supply a completed PAT for submission.

What still needs practice

Extend each track with complete circuit interpretation, measurement and fault analysis, advanced switching or control questions and the separately assessed PAT.

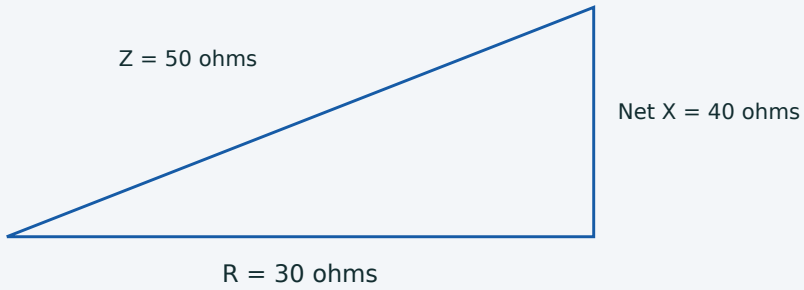
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Series RLC impedance

MR-ET-04 • Subtract opposite reactances before using the triangle.

Worked question

A series circuit has resistance 30 ohms, inductive reactance 50 ohms and capacitive reactance 10 ohms. Supply is 100 V rms. Find impedance, current and power factor.



Original method sketch; schematic unless stated. Use the given values, not measurements from this image.

1. Net reactance: $50 - 10 = 40$ ohms inductive.

2. Impedance: $Z = \sqrt{30^2 + 40^2} = 50$ ohms.

3. Current: $\frac{100}{50} = 2A$ rms.

4. Power factor: $\frac{30}{50} = 0.6$ lagging.

5. Real power: $100 \times 2 \times 0.6 = 120W$.

Check the reasoning

The resistive check is $I^2R = 4 \times 30 = 120W$.

Avoid this mistake

Do not add reactances that oppose each other.

Your turn

$R = 40$ ohms, net capacitive reactance 30 ohms, supply 100 V. Find Z, I and power factor.

Click here for the explained practice answer.

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Inverting amplifier gain

MR-ET-09 • Use the feedback-to-input resistance ratio with a negative sign.

Worked question

An ideal inverting amplifier has input resistance 10 kilohms and feedback resistance 50 kilohms. Input is 0.2 V. Assume adequate supply rails. Find gain and output.

1. Gain: $-\frac{50}{10} = -5$.

2. Output: $-5 \times 0.2 = -1\text{V}$.

3. The negative sign indicates inversion relative to the input.

4. The ideal result must remain within the practical output swing.

Check the reasoning

Both resistances use the same unit, so the units cancel.

Avoid this mistake

Do not ignore saturation if the predicted output exceeds the supply capability.

Your turn

Input resistance 20 kilohms, feedback 100 kilohms, input 0.1 V. Calculate.

Click here for the explained practice answer.

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Build a logic truth table

MR-ET-14 • Evaluate intermediate operations for every input combination.

Worked question

For output $Y = A$ AND (NOT B), list the outputs for inputs 00, 01, 10 and 11.

A	B	NOT B	Y
0	0	1	0
0	1	0	0
1	0	1	1
1	1	0	0

1. $A = 0$, $B = 0$: NOT $B = 1$; output 0.

2. $A = 0$, $B = 1$: NOT $B = 0$; output 0.

3. $A = 1$, $B = 0$: NOT $B = 1$; output 1.

4. $A = 1$, $B = 1$: NOT $B = 0$; output 0.

5. Y is high only when A is high and B is low.

Check the reasoning

The four input combinations are all included.

Avoid this mistake

NOT applies to B only, not the full expression.

Your turn

Find outputs for Y = (NOT A) AND B in the same order.

Click here for the explained practice answer.

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Series RLC impedance

MR-ET-04 • Practice answer

R = 40 ohms, net capacitive reactance 30 ohms, supply 100 V. Find Z, I and power factor.

Step-by-step answer

1. $Z = \sqrt{40^2 + 30^2} = 50$ ohms.

2. $I = 2A$.

3. Power factor 0.8 leading.

Make the correction useful

Explain your first missed step, correct it and repeat the task without copying. For practical tasks, inspect the saved result rather than only reading the solution.

Return to the worked method

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Inverting amplifier gain

MR-ET-09 • Practice answer

Input resistance 20 kilohms, feedback 100 kilohms, input 0.1 V. Calculate.

Step-by-step answer

1. Gain −5.

2. Output −0.5 V under the ideal assumptions.

Make the correction useful

Explain your first missed step, correct it and repeat the task without copying. For practical tasks, inspect the saved result rather than only reading the solution.

Return to the worked method

Build a logic truth table

MR-ET-14 • Practice answer

Find outputs for Y = (NOT A) AND B in the same order.

Step-by-step answer

1. 00 gives 0.

2. 01 gives 1.

3. 10 gives 0.

4. 11 gives 0.

Make the correction useful

Explain your first missed step, correct it and repeat the task without copying. For practical tasks, inspect the saved result rather than only reading the solution.

Return to the worked method

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Continue with official papers

Scope checked 9 October 2026. The source links support the assessment map; all worked and practice questions in this pack are newly authored.

Subject examination guideline

Power Systems guideline

Electronics guideline

Digital Electronics guideline

2026 ATP retention and CAT / IT update exceptions

2021 guideline extension through 2026

DBE annual teaching plans

DBE released 2026 papers and marking guidelines

Current official PAT directory

Error log

Question ID: _____ Date: _____
First incorrect step: _____
Why it failed: _____
Correct method: _____
Retry date and result: _____

Use the matching memo, answer book and addenda for the actual paper. Questions here have no official mark allocation. Check explanations with your teacher before using these drafts as a sole revision source.

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