

The following 20 questions are equally weighted. In addition, your answers must be as brief as possible.

1. What does Kirchhoff's voltage law state? Can this law be applied to ac circuit? How?
2. What is the relationship between Thevenin and Norton equivalent circuits?
3. Draw the symbol for a voltage-controlled current source.
4. Describe about the virtually-short property for an ideal op amp.
5. What is the superposition principle?
6. What are the reasons that almost all electric power is generated and delivered by polyphase over single phase system?
7. We can obtain a high-pass or a low-pass filter from a simple RC circuit. How to make it?
8. What are the applications for transformers?
9. What is the power factor in sinusoidal power calculation? How to correct it?
10. What is the condition that maximum average power will transfer to the load in an ac circuit?
11. What's the current-voltage equations of a MOSFET?
12. What's the depletion region of a pn junction?
13. Explain base-width modulation (the Early effect).
14. Draw the small signal model of a MOSFET?
15. Draw the circuit diagram of a simple current mirror.
16. Draw the circuit diagram of a common emitter amplifier.
17. Explain how an OPAMP can be frequency-compensated using a Miller capacitor.
18. Show how a switched capacitor behaves as a resistor.
19. What's Darlington configuration?
20. Draw the circuit diagram of a CMOS inverter.