

# Basic Qualification Question Bank for Amateur Radio Operator Certificate Examinations

## Circuit Components

6 Questions on Exam



**B-004-01-01 (1)**

**A circuit designed to increase the level of its input signal is called:**

- an amplifier
- a modulator
- an oscillator
- a receiver

**B-004-01-02 (1)**

**If an amplifier becomes non- linear, the output signal would:**

- become distorted
- be saturated
- cause oscillations
- overload the power supply

**B-004-01-03 (3)**

**To increase the level of very weak radio signals from an antenna, you would use:**

- an RF oscillator
- an audio oscillator
- an RF amplifier
- an audio amplifier

**B-004-01-04 (3)**

**To increase the level of very weak signals from a microphone you would use:**

- an RF oscillator
- an RF amplifier
- an audio amplifier
- an audio oscillator

**B-004-01-05 (4)**

**The range of frequencies to be amplified by a speech amplifier is typically:**

- 3 to 300 Hz
- 300 to 1000 Hz
- 40 to 40 000 Hz
- 300 to 3400 Hz

**B-004-01-06 (2)**

**Which of the following IS NOT amplified by an amplifier?**

- current
- resistance
- power
- voltage

**B-004-01-07 (4)**

**The increase in signal level by an amplifier is called:**

- attenuation
- amplitude
- modulation
- gain

**B-004-01-08 (4)**

**A device with gain has the property of:**

- attenuation
- oscillation
- modulation
- amplification

**B-004-01-09 (4)**

**A device labelled "Gain = 10 dB" is likely to be an:**

attenuator  
oscillator  
audio fader  
amplifier

**B-004-01-10 (2)**

**Amplifiers can amplify:**

current, power, or inductance  
voltage, current, or power  
voltage, power, or inductance  
voltage, current, or inductance

**B-004-01-11 (4)**

**Which of the following is not a property of an amplifier?**

gain  
linearity  
distortion  
loss

**B-004-02-01 (2)**

**Zener diodes are used as:**

current regulators  
voltage regulators  
RF detectors  
AF detectors

**B-004-02-02 (4)**

**One important application for diodes is recovering information from transmitted signals. This is referred to as:**

regeneration  
ionization  
biasing  
demodulation

**B-004-02-03 (2)**

**The primary purpose of a Zener diode is to:**

provide a voltage phase shift  
regulate or maintain a constant voltage  
to boost the power supply voltage  
provide a path through which current can flow

**B-004-02-04 (2)**

**The action of changing alternating current to direct current is called:**

amplification  
rectification  
transformation  
modulation

**B-004-02-05 (2)**

**The electrodes of a semi- conductor diode are known as:**

gate and source  
anode and cathode  
collector and base  
cathode and drain

**B-004-02-06 (3)**

**If alternating current is applied to the anode of a diode, what would you expect to see at the cathode?**

No signal  
Steady direct current  
Pulsating direct current  
Pulsating alternating current

**B-004-02-07 (4)**

**In a semi-conductor diode, electrons flow from:**

anode to cathode  
cathode to grid  
grid to anode  
cathode to anode

**B-004-02-08 (1)**

**What semi-conductor device glows red, yellow, or green, depending upon its chemical composition?**

A light-emitting diode  
A fluorescent bulb  
A neon bulb  
A vacuum diode

**B-004-02-09 (4)**

**Voltage regulation is the principal application of the:**

junction diode  
light-emitting diode  
vacuum diode  
Zener diode

**B-004-02-10 (2)**

**In order for a diode to conduct, it must be:**

close coupled  
forward-biased  
enhanced  
reverse-biased

**B-004-03-01 (2)**

**Which component can amplify a small signal using low voltages?**

A variable resistor  
An electrolytic capacitor  
A multiple-cell battery  
A PNP transistor

**B-004-03-02 (3)**

**The basic semi-conductor amplifying device is the:**

tube  
P-N junction  
transistor  
diode

**B-004-03-03 (2)**

**The three leads from a PNP transistor are named:**

drain, base and source  
collector, emitter and base  
collector, source and drain  
gate, source and drain

**B-004-03-04 (4)**

**If a low level signal is placed at the input to a transistor, a higher level of signal is produced at the output lead. This effect is known as:**

detection  
modulation  
rectification  
amplification

**B-004-03-05 (2)**

**Bipolar transistors usually have:**

2 leads  
3 leads  
1 lead  
4 leads

**B-004-03-06 (1)**

**A semi-conductor is described as a "general purpose audio NPN device". This would be:**

- a bipolar transistor
- a silicon diode
- a triode
- an audio detector

**B-004-03-07 (2)**

**The two basic types of bipolar transistors are:**

- diode and triode types
- NPN and PNP types
- varicap and zener types
- P and N channel types

**B-004-03-08 (1)**

**A transistor can be destroyed in a circuit by:**

- excessive heat
- excessive light
- saturation
- cut-off

**B-004-03-09 (2)**

**In a bipolar transistor, the \_\_\_\_\_ compares closest to the control grid of a triode vacuum tube.**

- emitter
- base
- source
- collector

**B-004-03-10 (3)**

**In a bipolar transistor, the \_\_\_\_\_ compares closest to the plate of a triode vacuum tube.**

- gate
- emitter
- collector
- base

**B-004-03-11 (4)**

**In a bipolar transistor, the \_\_\_\_\_ compares closest to the cathode of a triode vacuum tube.**

- collector
- base
- drain
- emitter

**B-004-04-01 (4)**

**The two basic types of field effect transistors (FET) are:**

NPN and PNP  
germanium and silicon  
inductive and capacitive  
N and P channel

**B-004-04-02 (2)**

**A semi-conductor having its leads labelled gate, drain, and source is best described as a:**

gated transistor  
field-effect transistor  
bipolar transistor  
silicon diode

**B-004-04-03 (1)**

**In a field effect transistor, the \_\_\_\_\_ is the terminal that controls the conductance of the channel.**

gate  
drain  
source  
collector

**B-004-04-04 (1)**

**In a field effect transistor, the \_\_\_\_\_ is the terminal where the charge carriers enter the channel.**

source  
gate  
drain  
emitter

**B-004-04-05 (3)**

**In a field effect transistor, the \_\_\_\_\_ is the terminal where the charge carriers leave the channel.**

collector  
source  
drain  
gate

**B-004-04-06 (3)**

**Which semi-conductor device has characteristics most similar to a triode vacuum tube?**

Junction diode  
Zener diode  
Field effect transistor  
Bipolar transistor

**B-004-04-07 (1)**

**The control element in the field effect transistor is the:**

gate  
source  
drain  
base

**B-004-04-08 (1)**

**If you wish to reduce the current flowing in a field effect transistor, you could:**

increase the reverse bias voltage  
decrease the reverse bias voltage  
increase the forward bias voltage  
increase the forward bias gain

**B-004-04-09 (2)**

**The source of a field effect transistor corresponds to the \_\_\_\_\_ of a bipolar transistor.**

base  
emitter  
drain  
collector

**B-004-04-10 (2)**

**The drain of a field effect transistor corresponds to the \_\_\_\_\_ of a bipolar transistor.**

base  
collector  
source  
emitter

**B-004-04-11 (4)**

**Which two elements in a field effect transistor exhibit fairly similar characteristics?**

Source and gate  
Gate and drain  
Source and base  
Source and drain

**B-004-05-01 (2)**

**What is one reason a triode vacuum tube might be used instead of a transistor in a circuit?**

It uses less current  
It may be able to handle higher power  
It is much smaller  
It uses lower voltages

**B-004-05-02 (1)**

**Which component can amplify a small signal but must use high voltages?**

- A vacuum tube
- A transistor
- An electrolytic capacitor
- A multiple-cell battery

**B-004-05-03 (2)**

**A feature common to tubes and transistors is that both:**

- have electrons drifting through a vacuum
- can amplify signals
- convert electrical energy to radio waves
- use heat to cause electron movement

**B-004-05-04 (2)**

**In a vacuum tube, the electrode that is operated with the highest positive potential is the \_\_\_\_\_.**

- filament (heater)
- plate
- cathode
- grid

**B-004-05-05 (2)**

**In a vacuum tube, the electrode that is usually a cylinder of wire mesh is the \_\_\_\_\_.**

- filament (heater)
- grid
- cathode
- plate

**B-004-05-06 (4)**

**In a vacuum tube, the element that is furthest away from the plate is the \_\_\_\_\_.**

- grid
- emitter
- cathode
- filament (heater)

**B-004-05-07 (1)**

**In a vacuum tube, the electrode that emits electrons is the \_\_\_\_\_.**

- cathode
- grid
- collector
- plate

**B-004-05-08 (2)**

**What is inside the envelope of a triode tube?**

argon  
a vacuum  
air  
neon

**B-004-05-09 (4)**

**How many grids are there in a triode vacuum tube?**

two  
three  
three plus a filament  
one

**B-004-05-10 (2)**

**If you do not wish to have current flowing in the grid circuit of a vacuum tube, the grid should be:**

positive with respect to the anode  
negative with respect to the cathode  
positive with respect to both cathode and anode  
positive with respect to the cathode

**B-004-05-11 (2)**

**The negative DC control voltage applied to the control grid of a vacuum tube is called:**

suppression voltage  
bias voltage  
repulsion voltage  
excitation voltage

**B-004-06-01 (2)**

**How do you find a resistor's tolerance rating?**

By using Thevenin's theorem for resistors  
By reading the resistor's color code  
By reading its Baudot code  
By using a voltmeter

**B-004-06-02 (3)**

**What do the first three-color bands on a resistor indicate?**

The resistance material  
The power rating in watts  
The value of the resistor in ohms  
The resistance tolerance in percent

**B-004-06-03 (4)**

**What does the fourth color band on a resistor mean?**

- The value of the resistor in ohms
- The power rating in watts
- The resistance material
- The resistance tolerance in percent

**B-004-06-04 (1)**

**What are the possible values of a 100 ohm resistor with a 10% tolerance?**

- 90 to 110 ohms
- 90 to 100 ohms
- 10 to 100 ohms
- 80 to 120 ohms

**B-004-06-05 (1)**

**How do you find a resistor's value?**

- By using the resistor's color code
- By using a voltmeter
- By using Thevenin's theorem for resistors
- By using the Baudot code

**B-004-06-06 (4)**

**Which tolerance rating would a high quality resistor have?**

- 5%
- 10%
- 20%
- 0.1%

**B-004-06-07 (1)**

**Which tolerance rating would a low quality resistor have?**

- 20%
- 0.1%
- 5%
- 10%

**B-004-06-08 (2)**

**If a carbon resistor's temperature is increased, what will happen to the resistance?**

- It will stay the same
- It will change depending on the resistor's temperature coefficient rating
- It will become time dependent
- It will increase by 20% for every 10 degrees centigrade

**B-004-06-09 (3)**

**A gold band on a resistor indicates the tolerance is:**

20%

10%

5%

1%

**B-004-06-10 (1)**

**A resistor with a colour code of brown, black, and red, would have a value of:**

1000 ohms

100 ohms

10 ohms

10 000 ohms

**B-004-06-11 (4)**

**A resistor is marked with the colors red, violet and yellow. This resistor has a value of:**

274

72 k

27 M

270 k