

Trending

Basic Electronics Engineering Interview Questions & Answers

Electrical Technology 3 13 minutes read

65+ Electronics Engineering Interview Questions & Answers

Electronics Engineering, like any other engineering job, has many **technical questions**. To shine better at electronics engineering interview, you need to have a strong grip over the technical questions. You need to keep yourself updated with **electronics engineering interview questions** to outperform other candidates. You do not want someone who has no knowledge about technical questions to outperform you in electronics engineering interview.

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Here are some of the **most asked basic Electronics Engineering interview questions**.

- **What is Electronics Engineering?**

Electronics engineering is a field of engineering which deals with the utilization of active and passive electronic components to design a variety of different analog and digital circuits, devices, and systems.

These devices are implemented in logic circuits, communication systems, robotics, microprocessors and Artificial intelligence to perform useful tasks efficiently and for the betterment of human beings.

It usually deals with low current voltage (compared to Electrical Engineering) specifically between -48v to 48v.

Related Question: [What is the main Difference Between Electrical and Electronic Engineering?](#)

- **What are Active and Passive components?**

Active components are those electrical components which require an **external source** for its full operation such as Diode, Transistor, Thyristor etc.

Passive components are those components which do not need any external source for its function. Example of passive components is resistor, capacitor & Inductor.

Related Post: [The Main Difference between Active and Passive Components \(Examples\)](#)

- **What is a Resistor?**

A **resistor** is an electronic component with two terminals, which resist or oppose the electrical current in its path. It also develops a voltage drop across its terminals, which depends on the current flowing through it. This voltage drop is calculated using the Ohm's law: **$V = IR$** .

- **What is a Capacitor?**

A **capacitor** is a two-terminal electronic component, which stores potential energy in the form of charge. The property or ability of the capacitor to store charge is called **capacitance** and it is measured in **Farad**. The stored charge q can be measured using the equation: $q = CV$

- **What is an Inductor?**

An **inductor** is an electronic device, which resists the change in electrical current passing through it. It stores energy in the form of the magnetic field when the current pass through it. The voltage drop across an inductor can be calculated using: $V = L (di/dt)$.

- **What is Practical & Ideal Voltage Source?**

A voltage source having some internal resistance is called a **practical voltage source**. Due to this resistance, there is a **voltage drop**. The supply voltage of the practical voltage source decreases with an increase in the current.

If the internal resistance of a voltage source becomes zero the source is said to be an **ideal voltage source**. And its voltage does not decrease with the increase in current.

Related Post: [What is the differences between E.M.F and Voltage \(P.d\)](#)

- **What is Practical & Ideal Current Source?**

The **ideal current source** has infinite internal resistance. Its current does not depend on its supply voltage.

A **practical current source** has a large internal resistance. Its supply current decreases with the increase in its supply voltage.

- **What is Norton theorem?**

Any combination of batteries and resistances in a linear circuit is equivalent to and can be represented by an ideal current source and a resistor in parallel. You may follow the [step by step tutorial for solved examples through Norton's Theorem](#).

- **What is Thevenin theorem?**

Any combination of batteries and resistance in a linear circuit can be represented by a signal voltage source and a resistor in series. You may follow the [step by step tutorial for solved examples through Thevenin's Theorem](#).

- **What is a Transistor?**

A **transistor** is a three-terminal semiconductor device. It is can be used for amplifying or switching an electrical signal.

- **How does the Transistor act as a Switch?**

There are three useful regions of operation of a transistor namely saturation region, cutoff region & active region.

In the **active region**, the transistor acts as an amplifier.

In the **saturation region**, the transistor acts as a **closed switch**.

In the **cutoff region**, the transistor acts as an **open switch**.

So to use a transistor as a switch, it needs to be operated in the **saturation & cutoff** region.

- **What is meant by Clipper and Clamper?**

A **clipper** is a circuit that clips or cutoff voltage above or below a certain specified level. Positive clipper cuts off a portion of positive half of a signal while negative clipper cuts off from the negative half.

A **clamper** is a circuit that adds voltage in the positive or negative half of the signal to a specified peak voltage. A clamper moves the whole signal up and down to reach the specified peak voltage.

- **What is SCR**

Silicon controlled rectifier or **thyristor** is unidirectional semiconductor device but unlike diode, it has three terminals Anode, Cathode & Gate. The SCR can be switched on & off using the gate input.

- **What is Diode?**

A **diode** is a unidirectional semiconductor device with two terminals called Anode & Cathode. A diode can allow current in only one direction which is known as forward bias.

- **Difference between Silicon and Germanium Diode & why is Silicon diode preferred?**

The voltage drop of a silicon diode is **0.7v** and that of germanium diode is **0.3v**.

Silicon crystals are more resistant to **heat** than germanium.

Silicon diode has a **high voltage rating** than the germanium diode.

Silicon diodes are more preferable because silicon is available in **abundant** compared to germanium.

- **What is the main difference between BJT and FET?**

BJT stand for **bipolar junction transistor** and FET is the acronym for **Field Effect Transistor**.

BJT is **bipolar** that is there is a flow of both **minority and majority** charge carriers, while FET is **unipolar** that is there is a flow of only majority carriers.

BJT is controlled using the **input current** (base current) while FET is controlled using the **input voltage** (Gate voltage).

The **input impedance** of FET is much higher compared to BJT.

The three terminals of BJT is emitter, base & collector while FET is drain, gate & source

- **What is a Transformer?**

A **transformer** is a static electrical device which transfers electrical energy from one circuit to another circuit without any physical connection instead it uses the principles of **electromagnetic induction**. A transformer either increase or decrease the input voltage & current.

Related Post: [What is the difference between Power Transformers and Distribution Transformers?](#)

- **What is Oscillator?**

An oscillator is an electronic circuit which generates a **periodic AC signal** from a DC source. An oscillator has no input. The output of oscillator can be sinusoidal or Square or a triangle wave.

- **What is Communication?**

The **transfer of information** from one place to another place using some sort of **medium** is called **Communication**. The information could be in any form such as a sound or visual or electrical signal etc.

- **What is the Baseband Signal?**

A signal consisting of significantly lower frequency (up to **10 kHz**) is known as a **baseband signal**.

Example of the baseband signal is voice (**300Hz to 3.5 kHz**), audio (**20 Hz to 20 kHz**) and a video signal (**0Hz to 4.5 MHz**).

The baseband signal cannot be transmitted directly through the antenna. They are transmitted using copper wire or fiber optics etc.

Related Post: [Introduction to Signals, Types, Properties, Operation & Application](#)

- **What is a Bandpass or Passband Signal?**

A signal consisting of significantly higher frequencies (Higher than **100 kHz**) is known as **Passband** or **BandPass** signal. **Bandpass signal** does not contain any frequency lower than **100 kHz**.

Bandpass signal can be directly transmitted through the **antenna**.

- **What is Modulation?**

The process in which one of the characteristic parameter (amplitude, frequency, phase) of the **carrier signal** varies linearly with respect to **message signal's amplitude** is called modulation.

Related Post: [Modulation – Classification and Types of Analog Modulation](#)

- **Why do we need Modulation?**

Modulation converts a baseband signal into a passband signal making it suitable for **long distance communication** using an antenna.

Antenna size also depends on the frequency of the transmitting signal, so the modulation allows us to use a small size antenna.

Using Modulation we can assign different frequencies to different signals which allow us to send **multiple signals** using the same medium without interference.

Related Post: [Types of Modulation Techniques used in Communication Systems](#)

- **What is Demodulation?**

The demodulation is a process of **extracting** the information or message signal from the received or modulated signal.

- **What are the Types of Modulation?**

Two main types of modulation are **Analog modulation** and **Digital modulation**.

Analog modulation is further divided into three types;

Amplitude modulation (AM): **DSB-FC, DSB-SC, SSB-SC, SSB-FC, VSB**

Frequency modulation (FM): **NBFM, WBFM**

Phase modulation (PM):

Whereas, **Digital modulation** is further divided;

Digital Amplitude modulation: **ASK, PAM, QAM**

Digital phase modulation: **PSK, DPSK, OPSK**

Digital Frequency modulation: **FSK**

Continuous phase modulation: **GMSK, MSK, CPFSK**

Trellis-coded modulation: **PSK, QAM**

- **What is the difference between AM and FM Modulation?**

AM signals can be affected by **noise** as the information lies in the amplitude of the signal, while **FM** is **immune to noise** because the information lies in the frequency of the signal.

The design of Transmitter and receiver for **AM** is **very simple** except for some cases like SSB. While in FM, the transmitter and receiver have a **complex design**.

AM signal can travel **long distances** as compared to FM signals.

FM signal's transmission **consume more power** as compared to AM signal's transmission.

AM signal frequency ranges in **KHz** while FM signal frequency ranges in **MHz**

- **What is a Repeater in Telecommunication?**

As we know that a transmitted signal loses its power when it travels long distances. To retain and maintain its full power, the signal is boosted through a device known as a **repeater** for long distance communication.

Usually, a repeater retransmits the identical signal but it may change the medium or frequency of the signal according to the need.

- **What is the difference between Analog and Digital signal?**

Analog signal has continuous time and continuous amplitude while digital signal has discrete time and discrete amplitude.

- **Difference between Digital and Discrete signal.**

Digital signal is a signal which has discrete time and discrete amplitude.

Discrete signal often known as the **discrete-time signal** is a signal, which has discrete time but continuous (it can have any value) amplitude.

- **What is Sampling?**

Sampling is a process of converting a **continuous time** signal into a **discrete time** signal but not a digital signal.

- **What is the Nyquist Criteria for Sampling?**

Suppose the maximum frequency of the analog signal is f_{\max} then the Nyquist criteria suggest that the sampling rate for this analog signal must be $2f_{\max}$ or greater.

- **What is Aliasing?**

Aliasing is a signal effect related to sampling. When a signal is sampled at a sampling rate less than the required rate, the signal becomes indistinguishable from other signals and after reconstruction, the signal does not look anything like the original signal. This effect is called **Aliasing**.

Related Post: [What is Quantization & Sampling? Types & Laws of Compression](#)

- **What is a Filter?**

A Filter is an electronic circuit that removes specific or unwanted frequency components from a signal. The types of filters are:

- Low pass filter
- Bandpass filter
- Band stop or band reject filter
- High pass filter
- Notch filter

Related Post: [Types of Low Pass Filters – RL and RC Passive Filters & Examples](#)

- **What is the Cutoff Frequency?**

The cutoff frequency is the point in a filter's frequency response where the pass band and stop band meets. A filter rejects or passes frequency components below or above cutoff frequency depending on the type of the filter.

The cutoff frequency is taken at -3db (Half power) of the maximum amplitude.

- **What is Passband?**

The passband is the range of frequencies that can be passed through the filter without any attenuation.

- **What is Stop band?**

The stopband is the range of frequencies that are attenuated and cannot be passed through the filter.

- **What is the Notch filter?**

The notch filter is a type of band stop filter with **very narrow** stop band.

- **What is the difference between the Notch and Bandstop filter?**

Band stop filter rejects a wide range of band while notch filter rejects a very narrow band. The notch filter is used for suppressing powerful laser beams.

- **What is a Logic Gate?**

A **digital logic gate** is an electronic device which implements the **Boolean function**. The boolean function performs a logical operation on one or more than one binary numbers.

- **What are basic Logic Gates?**

There are seven basic logic gates. **NOT**, **AND**, **OR**, **NAND**, **NOR**, **XOR**, **XNOR** gate.

- **What are derived Logic Gates?**

Derived logic gates are those gate which can be made from these three basic logic gates **NOT**, **AND** & **OR**.

NAND, NOR, XOR & XNOR are **derived logic gates**. Basic logic can be combined together to make these gates.

- **What is a Universal Logic Gate?**

A universal gate is a logic gate which can be solely used to implement any kind of boolean function. There are two universal logic gates namely **NAND** & **NOR** gate.

- **What is Positive Logic and Negative Logic?**

In digital logic, a Specific level of voltage is represented by binary numbers i.e. 1 or 0 in other words, True or False respectively.

In **positive logic**, the High-level voltage is represented by **1** or **True** & the low-level voltage is represented by **0** or **False**.

In **negative logic**, the High-level voltage is represented by **0** or **False** & the low-level voltage is represented by **1** or **True**.

- **What are Latches and Flip-Flops? Differences**

Latch and flip-flop are **memory devices** with two stable states. They are used for storing data (states) in sequential logic. The states are controlled using one or more than one control signals. It can store one bit of data.

The main difference between a latch and flip-flop is that latch is triggered (change states) by the **level** of input control signal & the flip-flop is triggered using the **edge** of input control signal known as a **clock signal**.

So we can say that latches are **level-triggered** devices and flip-flops are **edge-triggered** devices.

Related Post: [Digital Flip-Flops – SR, D, JK and T Flip Flops](#)

- **What is a Level trigger and Edge trigger?**

The level trigger means that the device will change its state according to the previous state, next state input and the **level** (stable 1 or 0) of the control signal.

Edge trigger means that the device will change its state according to the previous state, next state input and the **edge** (from +ve to -ve called “falling edge”, from -ve to +ve called “rising edge”) of the clock signal.

- **What is Combinational and Sequential logic?**

Combinational logic does not have a memory that is its **current output** depends only on the **current input**.

While sequential logic has a memory and its **current output** depends on the **previous output and current input**.

- **What is Ripple Carry Adder and Carry Look Ahead Adder?**

These two Digital binary adders are differentiated based on the carry determining technique.

In **ripple carry adder**, the carry bits ripple through each individual adder while in a carry-look-ahead adder, the carry bit is determined separately using a **CLA** (Carry look ahead) block.

CLA adder operates much **faster** than ripple adder as it bypasses many stages.

- **What is an Op-Amp?**

Operational amplifier often known as op-amp is an active voltage amplifying component. It can amplify voltage based on the **difference** of voltage between its two inputs.

- **What is Inverting and Non-inverting Amplifier?**

When the input voltage signal is applied to a **non-inverting** terminal (+ve terminal) of the Op-amp, the op-amp is said to be in a non-inverting configuration. Its gain is **positive** i.e. its output signal is **in-phase** with the input signal.

In inverting op-amp configuration, the input signal is applied to the **inverting terminal** (-ve terminal) of an op-amp. The gain of inverting op-amp is **negative** and the output signal is **180 degree** out of phase with respect to the input signal.

Related Post: [What is Negative Feedback and Negative Feedback Amplifier Systems](#)

- **What is the input and output Impedance of an Op-Amp?**

The **input impedance** of op-amp between its differential inputs is **very high** usually in **Mega Ohms to Tera Ohms** (ideally infinite). That is why the input current of an op-amp is very low (almost negligible)

The **output impedance** of an op-amp is **very low** (ideally zero).

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Some of the electronics engineering interview questions may be more casual like “why you choose this field?” etc. but we are covering more technical question.

These are some of the **basic electronic engineering interview questions**. if you think there are some questions related to electronics engineering interview that may have been asked or need to be added, please, feel free to **contact us** or use the **comment** box below to include any questions you

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