RF Engineer Job Interview Questions And Answers

Interview Questions Answers

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RF Engineer Interview Questions And Answers Guide.

Question - 1:

Do you know what is "energy harvesting"?

Ans:

Most passive RFID tags simply reflect back waves from the reader. Energy harvesting is a technique in which energy from the reader is gathered by the tagged, stored momentarily and transmitted back at a different frequency. This method may improve the performance of passive RFID tags dramatically.

View All Answers

Question - 2:

Do you know what is tag collision?

Ans:

Another problem readers have is reading a lot of chips in the same field. Tag collision occurs when more than one chip reflects back a signal at the same time, confusing the reader. Different vendors have developed different systems for having the tags respond to the reader one at a time. Since they can be read in milliseconds, it appears that all the tags are being read simultaneously.

View All Answers

Question - 3:

Do you know what is reader collision?

Ans:

One problem encountered with RFID is the signal from one reader can interfere with the signal from another where coverage overlaps. This is called reader collision. One way to avoid the problem is to use a technique called time division multiple access, or TDMA. In simple terms, the readers are instructed to read at different times, rather than both trying to read at the same time. This ensures that they don\'t interfere with each other. But it means any RFID tag in an area where two readers overlap will be read twice. So the system has to be set up so that if one reader reads a tag another reader does not read it again.

View All Answers

Question - 4:

Do you know the difference between read-only and read-write tags?

Ans:

Microchips in RFID tags can be read-write or read-only. With read-write chips, you can add information to the tag or write over existing information when the tag is within range of a reader, or interrogator. Read-write tags usually have a serial number that can\'t be written over. Additional blocks of data can be used to store additional information about the items the tag is attached to. Some read-only microchips have information stored on them during the manufacturing process. The information on such chips can never been changed. Other tags can have a serial number written to it once and then that information can\'t be overwritten later.

View All Answers

Question - 5:

Do you know how much information can the tag store?

Ans:

It depends on the vendor and the application, but typically a tag would carry no more than 2KB of data-enough to store some basic information about the item it is on. Companies are now looking at using a simple "license plate" tag that contains only a 96-bit serial number. The simple tags are cheaper to manufacture and are more useful for applications where the tag will be disposed of with the product packaging.

View All Answers

Question - 6:

Do you know what is an Electronic Product Code?

Ans:

The Electronic Product Code, or RFID, was developed by the Auto-ID Center as a successor to the bar code. It is a numbering scheme that will be used to identify products as they move through the global supply chain. For more on EPC technology.

View All Answers

Question - 7:

What is Passive tags in RF Engineering?

Ans:

One problem encountered with RFID is the signal from one reader can interfere with the signal from another where coverage overlaps. This is called reader collision. One way to avoid the problem is to use a technique called time division multiple access, or TDMA. In simple terms, the readers are instructed to read at different times, rather than both trying to read at the same time. This ensures that they don\'t interfere with each other. But it means any RFID tag in an area where two readers overlap will be read twice. So the system has to be set up so that if one reader reads a tag another reader does not read it again.

View All Answers

Question - 8:

What is active tags in RF Engineering?

Ans:

Active RFID tags have a battery, which is used to run the microchip\'s circuitry and to broadcast a signal to a reader (the way a cell phone transmits signals to a base station).

View All Answers

Question - 9:

Tell me did all countries use the same low-, high and ultra-high frequencies?

Ans:

Most countries have assigned the 125 kHz or 134 kHz area of the radio spectrum for low-frequncy systems, and 13.56 MHz is used around the world for high-frequency systems. But UHF RFID systems have only been around since the mid-1990s and countries have not agreed on a single area of the UHF spectrum for RFID. Europe uses 868 MHz for UHF and the U.S. uses 915 MHz. Until recently, Japan did not allow any use of the UHF spectrum for RFID, but it is looking to open up the 960MHz area for RFID. Many other devices use the UHF spectrum, so it will take years for all governments to agree on a single UHF band for RFID. Government\'s also regulate the power of the readers to limit interference with other devices. Some groups, such as the Global Commerce Initiative, are trying to encourage governments to agree on frequencies and output. Tag and reader makers are also trying to develop systems that can work at more than one frequency, to get around the problem.

View All Answers

Question - 10:

Do you know which frequency is right for your application?

Ans:

Different frequencies have different characteristics that make them more useful for different applications. For instance, low-frequency tags are cheaper than ultra high frequency (UHF) tags, use less power and are better able to penetrate non-metallic substances. They are ideal for scanning objects with high-water content, such as fruit, at close range. UHF frequencies typically offer better range and can transfer data faster. But they use more power and are less likely to pass through materials. And because they tend to be more "directed," they require a clear path between the tag and reader. UHF tags might be better for scanning boxes of goods as they pass through a bay door into a warehouse. It is probably best to work with a consultant, integrator or vendor that can help you choose the right frequency for your application.

View All Answers

Question - 11:

What is microwave frequency?

Ans:

Microwave (2.45 GHz) is also used in some applications. Radio waves behave differently at different frequency, so you have to choose the right frequency for the right application.

View All Answers

Question - 12:

What is ultra high- frequency(UHF)?

Ans:

RFID systems use many different frequencies, but ultra-high frequency, or UHF is (850-900 MHz)

View All Answers

Question - 13:

What is high- frequency?

Ans:

RFID systems use many different frequencies, but generally the most common are high- (13.56 MHz)

View All Answers

Question - 14:

What is low-frequency?

Ans:

RFID systems use many different frequencies, but generally the most common are low- (around 125 KHz)

View All Answers

Question - 15:

Tell me is RFID new?

Ans:

RFID is a proven technology that\'s been around since at least the 1970s. Up to now, it\'s been too expensive and too limited to be practical for many commercial applications. But if tags can be made cheaply enough, they can solve many of the problems associated with bar codes. Radio waves travel through most non-metallic materials, so they can be embedded in packaging or encased in protective plastic for weather-proofing and greater durability. And tags have microchips that can store a unique serial number for every product manufactured around the world.

View All Answers

Question - 16:

Explain is RFID better than using bar codes?

Ans:

RFID is not necessarily \"better\" than bar codes. The two are different technologies and have different applications, which sometimes overlap. The big difference between the two is bar codes are line-of-sight technology. That is, a scanner has to \"see\" the bar code to read it, which means people usually have to orient the bar code towards a scanner for it to be read. Radio frequency identification, by contrast, doesn\'t require line of sight. RFID tags can be read as long as they are within range of a reader. Bar codes have other shortcomings as well. If a label is ripped, soiled or falls off, there is no way to scan the item. And standard bar codes identify only the manufacturer and product, not the unique item. The bar code on one milk carton is the same as every other, making it impossible to identify which one might pass its expiration date first.

View All Answers

Question - 17:

What health risks associated with RFID and radio waves?

Ans:

RFID uses the low-end of the electromagnetic spectrum. The waves coming from readers are no more dangerous than the waves coming to your car radio.

View All Answers

Question - 18:

Do you know how an RFID system work?

Ans:

An RFID system consists of a tag, which is made up of a microchip with an antenna, and an interrogator or reader with an antenna. The reader sends out electromagnetic waves. The tag antenna is tuned to receive these waves. A passive RFID tag draws power from field created by the reader and uses it to power the microchip\'s circuits. The chip then modulates the waves that the tag sends back to the reader and the reader converts the new waves into digital data.

View All Answers

Question - 19:

Do you know what is RFID?

Ans:

Radio frequency identification, or RFID, is a generic term for technologies that use radio waves to automatically identify people or objects. There are several methods of identification, but the most common is to store a serial number that identifies a person or object, and perhaps other information, on a microchip that is attached to an antenna (the chip and the antenna together are called an RFID transponder or an RFID tag). The antenna enables the chip to transmit the identification information to a reader. The reader converts the radio waves reflected back from the RFID tag into digital information that can then be passed on to computers that can make use of it.

View All Answers

Question - 20:

Do you know what is Automatic Identification?

Ans:

Automatic identification, or auto ID for short, is the broad term given to a host of technologies that are used to help machines identify objects. Auto identification is often coupled with automatic data capture. That is, companies want to identify items, capture information about them and somehow get the data into a computer without having employees type it in. The aim of most auto-ID systems is to increase efficiency, reduce data entry errors, and free up staff to perform more value-added functions, such as providing customer service. There are a host of technologies that fall under the auto-ID umbrella. These include bar codes, smart cards, voice recognition, some biometric technologies (retinal scans, for instance), optical character recognition, and radio frequency identification (RFID).

View All Answers

Question - 21:

Radio Frequency common interview questions:

Ans:

? What is radio frequency (RF)? How is it measured?
? Is there a health hazard associated with radio frequency?
? How is it regulated? Are there any safety limits on human exposure to wireless and RF fields?
? Where can I go to learn more about regulatory compliance?
? What is a smart meter?
? Are Itron\'s smart meters certified by the FCC?
? How is Itron addressing the issue of RF Safety?

? Will a smart meter interfere with a security system, pacemaker, cell phone or other RF devices?

View All Answers

Question - 22:

Do you know what is a smart meter?

Ans:

Itron defines smart meters as devices that are like mini computers on houses and businesses. They communicate back and forth with the utility to automatically transmit meter information, such as energy consumption, spikes in power usage, and power outage and restoration messages to support various applications beyond monthly billings. Our smart metering solutions have substantially more features and functions than our advanced metering systems and technology. Smart meters are able to collect and store interval data, perform remote service connect/disconnect, send detailed information, receive commands, and interface with other devices, such as in-home displays, smart thermostats and appliances, home area networks, advanced control systems, and more.

View All Answers

Question - 23:

What health hazard associated with radio frequency?

Ans:

The only health effect from RF fields identified in scientific reviews has been related to an increase in body temperature (> 1 C) from exposure at very high field intensity found only in certain industrial facilities, such as RF heaters. The levels of RF exposure from base stations and wireless networks are so low that the temperature increases are insignificant and do not affect human health.

View All Answers

Question - 24:

How to measured radio frequency?

Ans:

Electromagnetic waves are measured by wavelength and frequency. Wavelength is the distance covered by one complete cycle of the electromagnetic wave. Frequency is the number of electromagnetic waves in one second, also known as a hertz or Hz. One Hz equals one cycle per second. One megahertz (MHz) equals one million cycles per second. Generally, microwaves are radio frequencies measuring more than 1 GHz.

View All Answers

Question - 25:

Do you know what is radio frequency?

Ans:

Electromagnetic fields, radio waves, microwaves and wireless signals are collectively referred to as radio frequency (RF) energy. RF energy is all around us. It\'s used in various electronics and appliances, including radio and television broadcasting, cellular telephones, satellite communications, microwave ovens, radars, and industrial heaters and sealers, to name a few.

View All Answers

Question - 26:

Do you know what is specific absorption rate?

Ans:

The SAR is the rate at which radio frequency energy is absorbed by a defined amount of mass of a biological body. SAR is expressed in units of watts per kilogram (W/kg).

View All Answers

Question - 27:

Tell me what if radiofrequency (RF) exposure limits are proposed by a land-use authority (LUA) or municipality?

Ans:

Radio communication, including the technical aspects of broadcasting, falls under the responsibility of the Minister of Industry, who has the power to establish standards, rules, policies and procedures regarding radio communication. The Minister, under this authority, has adopted the exposure limits specified in Health Canada\'s RF exposure guideline document as regulatory limits. All proponents and operators of radio communication and broadcasting installations and apparatus must demonstrate that their proposals will comply with the regulatory limits before constructing any installation and must continue to operate within these limits at all times.

View All Answers

Question - 28:

Do you know are multiple antenna towers and broadcast antennas safe?

Ans:

Yes multiple antenna towers and broadcast antennas safe

View All Answers

Question - 29:

Tell me are radiofrequency field measurements required?

Ans:

RF field measurements take into consideration local terrain and structures and indicate actual levels, whereas calculation is a prediction that includes certain

assumptions, erring on the side of caution. Industry Canada requires proponents and operators of radiocommunication and broadcasting installations to take RF field measurements to demonstrate compliance where it is suspected that the regulatory limits might be exceeded.

View All Answers

Question - 30:

Do you know what is the precautionary principle and when should it be used?

Ans:

The precautionary principle is a public policy approach for risk management of possible, but unproven, adverse health effects. The extent of the precautionary principle ranges from monitoring scientific developments and providing information to stronger measures, such as lowering exposures. The increasing public concern over the RF health issue has led to demands for industry and regulatory authorities to apply the precautionary principle to the use of cell phones and the proposed construction of new broadcasting and radiocommunication installations.
The application of the precautionary principle should be proportional to the level of risk and its associated uncertainty, the severity of the outcome and the level of societal benefit. In the context of RF energy from broadcasting and radiocommunication installations and apparatus, health risks from exposure below the limits specified in Health Canada\'s guideline document have not been established. Therefore, if precautionary measures are introduced to reduce exposure levels, it is recommended that they be made voluntary.

View All Answers

Question - 31:

Do you know how to established the radio frequency exposure limits?

Ans:

The limits specified in Health RF guideline document were established from the results of hundreds of studies over the past several decades where the effects of RF energy on biological organisms were examined. These limits are similar to other national and international standards that are based on established effects. All recognized standard-setting bodies use the same scientific data and a similar general approach to develop safety guidelines. Differences in interpreting the biological effects under certain exposure conditions sometimes result in small differences in the exposure limits. These small differences will not affect a person\'s health. Canada\'s exposure limits are among the most stringent guidelines that are based on established effects.

View All Answers

Question - 32:

Do you know what is electromagnetic hypersensitivity (EHS)? And please explain!

Ans:

EHS is a term used to describe a variety of non-specific symptoms, such as headache, fatigue, nausea, ringing in the ears, digestive disorders, skin redness and burning sensations, which some individuals attribute to electromagnetic field (EMF) exposure.
At levels normally encountered in our daily lives, EMFs are unperceived by our senses. Although EHS symptoms are real, numerous scientific studies have failed to demonstrate that they are associated with EMF exposure. In studies where human subjects (including EHS sufferers) were intentionally exposed to EMFs, most individuals were unable to detect whether EMFs were present, or showed symptoms that did not correlate with their actual exposure condition. The causes of EHS symptoms are unclear. There are suggestions that they might arise from environmental factors unrelated to EMFs. It is the opinion of Health Canada that there is no scientific evidence that the symptoms attributed to EHS are indeed caused by exposure to EMFs.

View All Answers

Question - 33:

Is it possible for different types of modulation to changebiological effects?

Ans:

Different signal modulations in both analogue (e.g. AM and FM) and digital (numeric) formats have been used in radio communication. Although most radio technologies originally used analogue signals, modern wireless telecommunications use digital transmissions. Detailed scientific reviews conducted so far have not revealed any hazard specific to different RF modulations.

View All Answers

Question - 34:

Do you know what is signal modulation?

Ans:

Signal modulation is a process whereby certain characteristics of a radio wave are varied with transmitted information (voice, pictures and data).

View All Answers

Question - 35:

Explain are there any epidemiological studies of RF exposure?

Ans:

There have been numerous epidemiological studies on RF exposure and its impacts on human health. The majority of these studies have failed to find any association between such exposure and any adverse heath effects.

View All Answers

Question - 36:

Do you know what is an epidemiological study?

Ans:

An epidemiological study is the investigation of the occurrence and causes of health effects in human populations.

View All Answers

Question - 37:

Do you know Which biological effects associated with radiofrequency (RF) exposure are considered "established effects"?

Ans:

An "established effect" is one that, based upon peer-reviewed scientific reports, is demonstrated to be reproducible (in more than one laboratory), consistent (within the same laboratory and across other laboratories) and causal (due to the exposure agent). Although several articles in the scientific literature report RF biological effects within a study, these effects do not necessarily stand up to scientific rigour because they are often not reproducible within the same (or other) laboratories or are subsequently found to arise as a result of confounding factors such as sample/tissue heating or vibration.

View All Answers

Question - 38:

Do you know What biological effects are associated with exposure to radiofrequency (RF) energy?

Ans:

The biological effects from laboratory studies reported in scientific peer-reviewed literature include those related to changes in temperature, blood brain barrier, melatonin, calcium efflux, DNA damage and gene expression. However, not all these biological effects have been established or are considered to be health effects. For example, blood brain barrier and melatonin effects have not been consistently replicated. Studies on DNA strand breaks have also failed numerous independent attempts at confirmation and calcium efflux changes are considered to be more of a biological response than an adverse health effect.
Several laboratory studies have looked into whether RF energy can initiate and promote cancer. The overwhelming majority of these studies have found no evidence that RF energy damages DNA or that it is likely to act as an initiator or a promoter of carcinogenesis.

View All Answers

Question - 39:

What is health effect in RF Engineering?

Ans:

A biological effect only becomes a health effect when it causes detectable impairment of health. According to the World Health Organization, health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."

View All Answers

Question - 40:

What is biological effect in RF Engineering?

Ans:

A biological effect occurs when a change can be measured in a biological system after an introduction of some type of stimulus (e.g. RF energy). The observation of a biological effect, in and of itself, does not necessarily suggest the existence of a health effect.

View All Answers

Question - 41:

Do you know what is time averaging and how does it apply to exposure?

Ans:

Health Canada\'s guideline document and most other RF exposure standards specify \"time-averaged\" maximum exposure limits. The purpose is to \"smooth out\" the short-term highs and lows of the exposure intensity to arrive at an \"average\" with which to compare to the limit. The averaging time is the time period over which exposure is averaged. The averaging time should not be interpreted as the maximum allowable exposure time.
As per Health guideline document, it is permissible to exceed the recommended exposure limits for short periods of time as long as the average exposure over the averaging time (0.1 hour or 6 minutes) does not exceed the limit.

View All Answers

Question - 42:

Do you know what amount of radiofrequency (RF) exposure is considered safe?

Ans:

Exposure to RF energy at levels below the regulatory limits is considered to be safe. These limits are based on the lowest exposure level at which the potential harmful effects to humans could occur. Safety factors are then incorporated to arrive at recommended exposure levels for protection of the general public.

View All Answers

Question - 43:

How general public protected from overexposure of radiofrequency energy?

Ans:

To protect the general public, Health Canada maintains its guideline document entitled Limits of Human Exposure to Radio frequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz, which is commonly referred to as Safety Code 6. This document has been adopted by many organizations across Canada and is referred to in several regulations. Industry Canada has adopted this guideline for the purpose of protecting the general public.

View All Answers

Question - 44:

What can you find at radio communication and broadcasting installations?

Ans:

At radio communication and broadcasting installations, you will generally find radio transmitters and receivers, transmission lines and antennas, as well as their supporting structures. Radiocommunication and broadcasting transmitters are electronic devices that generate RF signals which carry the information intended for receivers. The signals are transmitted by antennas and then picked up by receivers (via receive antennas), which then extract the information carried, be it a cell phone

conversation or a television program.

View All Answers

Question - 45:

What are the benefits and how much important radio frequency energy is?

Ans:

Probably the most important use for RF energy is in providing radio communication services to the public, industry and government. Radio and television broadcasting, cell phones, radio communications for emergency services, weather radar and satellite communications are examples of important applications. Non-communication uses of RF energy include industrial heating and microwave ovens. Some consumer uses of radio communication include baby monitors, garage door openers, cordless telephones, WI-FI, remote key-less car entry devices and various medical devices, just to name a few. As well, certain non-radio devices, including computers and other digital devices, also emit RF energy.

View All Answers

Question - 46:

Do you know what is radiofrequency energy?

Ans:

RF energy is one form of electromagnetic energy that is a component of the electromagnetic spectrum, which covers microwaves, visible light and X-rays, as well as many more kinds of energy emissions. RF energy, sometimes called "RF emissions," "RF waves" or "RF fields," is generated when a source current, such as a transmitter, is fed to an antenna. This current excites electrons within the antenna and the energy moves outward in the form of an electromagnetic wave.

View All Answers

Question - 47:

In which areas RF Engineer works?

Ans:

RF engineering is a highly specialized field falling typically in one of two areas:
*Providing or controlling coverage with some kind of antenna/transmission system
*Generating or receiving signals to or from that transmission system to other communications electronics or controls.

View All Answers

Question - 48:

What is RF Engineering?

Ans:

Radio-frequency engineering is a part of electrical engineering that deals with devices that are designed to operate in the radio frequency spectrum. These devices operate within the range of about 3 kHz up to 300 GHz.
RF engineering is incorporated into almost everything that transmits or receives a radio wave, which includes, but is not limited to, mobile phones, radios, Wi-Fi, and two-way radios.

View All Answers

Question - 49:

Tell me do you have experience managing project budget?

Ans:

If you do, describe budget and milestone reports you did, and strategies you developed, proposed, and implemented to achieve RF project milestones on time.

View All Answers

Question - 50:

Tell me the demonstration of your communication skills?

Ans:

Describe anything related to communication with colleagues, clients, and management: presentations and reports, phone and online communication, client representation, coaching, etc.

View All Answers

Question - 51:

Tell me did you ever participate in recruitment processes and/or coaching other RF engineers?

Ans:

If you did, describe how you chose candidates, and how you advertised and conducted the recruitment campaign. Talk about any presentations and manuals you might have made as part of coaching campaigns you participated in.

View All Answers

Question - 52:

Do you know what is model calibration, map generation, frequency planning, data post-processing, and data-base maintenance?

Ans:

You can define these responsibilities, give examples of your experience performing them, and add information on your familiarity with relevant propagation tools, like Wizard, Planet, Tornado, etc.

View All Answers

Question - 53:

Do you know What is optimization in RF engineering?

Ans:

Give specific examples from personal experience: antennae selection, tilting (mechanical or electrical), antenna clearance, power settings, etc.

View All Answers

Question - 54:

How was your experience in RF design and implementation?

Ans:

Describe any jobs or assignments you were involved in with wireless telecommunication, with an emphasis on design, implementation, and optimization of networks. Describe responsibilities like initial system dimensioning and design, coverage and frequency planning, interference analysis, etc.

View All Answers

Question - 55:

Did you work in the field of RF engineering?

Ans:

Begin with specific places you worked, like government agencies or manufacturing companies. You can then briefly add what exactly you did in RF engineering in each of those places.

View All Answers

Question - 56:

Tell us what is your experience with RF technology?

Ans:

You can describe what you know about it, specific projects you have done, or relevant places you worked in - government, security, information technology industries, etc.

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