

CONCEPTUAL PHYSICS CHAPTER 37

ASSESSMENT ANSWERS

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How does the frequency of changing magnetic field compare with the frequency of the alternating voltage that is induced? In fact: frequency of the alternating voltage = frequency of changing magnetic field. Generator: when coil is rotated in a stationary magnetic field: ac voltage induced by the changing field within the loop.

Why is it more difficult to move a magnet into a coil of more loops that is connected to a resistor? Assertion :It is more difficult to push a magnet into a coil with more loops. Reason: Emf induced in the current loop resists the motion of the magnet.

How does the relative number of turns on the primary and secondary coil in a transformer affect the step up or step down voltage factor? Voltage factor through a coil is directly proportional to number of turns of a coil. For step ? up transformer, output voltage is more than input voltage. Hence, number of turns in secondary coil is more as compared to primary coil for step ? up transformer.

What did Michael Faraday and Joseph Henry discover on Quizlet? Final answer: Michael Faraday and Joseph Henry discovered electromagnetic induction, which is the generation of electric currents by changing magnetic fields. Explanation: The important discovery made by physicists Michael Faraday and Joseph Henry was electromagnetic induction.

How does the frequency of induced voltage compare to how frequently a magnet is plunged in and out of a coil of wire? The frequency of this induced voltage is directly proportional to the frequency at which the magnetic flux through

the coil is changing. Therefore, the frequency of the induced voltage is directly related to the frequency at which one pole of a magnet is plunged in and out of a coil of wire.

How does the frequency of induced voltage compare with how frequently a magnet is plunged into and out of a coil of wire Quizlet? 6. How does the frequency of induced voltage compare to how frequently a magnet is plunged in and out of a coil of wire? Frequency of the alternating voltage induced equals the frequency of the changing magnetic field within the loop.

What happens when you move a magnet quickly through a loop of wire? When a magnet is moved into a coil of wire, changing the magnetic field and magnetic flux through the coil, a voltage will be generated in the coil according to Faraday's Law.

Did making more loops make the electromagnet stronger or weaker? If you add more coils and don't change the solenoid's length, the field strength increases. So, if you add more coils but increase its length proportionally more, you decrease the magnet's strength.

When you add more coils to an electromagnet does the magnet get stronger or weaker? You can add more coils on top of the first row, and this just adds more field strength. In technical terms, every coil of wire increases the "magnetic flux density" (strength) of your magnet.

What is the advantage of stepped core arrangement in larger transformers? As the rating are increased stepped or multi stepped cores are preferred, which improves mechanical stability, reduce the length of mean turn and results savings in copper besides increasing efficiency and improves regulation.

Can a step down transformer be used as a step up transformer? Step-down transformers are occasionally used as a step-up transformer by "reverse feeding" or "back feeding" the transformer. Reverse feeding is simply a matter of having the power supply enter at the low voltage windings.

Why do step up transformers increase voltage? The increase in voltage is directly proportional to the ratio of the number of turns in the secondary coil to the primary coil. The reason for increasing the voltage is to decrease the current.

According to Ohm's law , the current in a circuit is inversely proportional to the voltage.

Why is it difficult to move a magnet into a coil of more loops that is connected to a resistor? When a coil has a large number of turns, then the magnitude of induced e.m.f. in the coil becomes more and hence by Lenz's law, it opposes more.

How can a voltage be induced in a coil of wire using a magnet? If this magnet is inserted into the coil of wire, the flux field will cut through the wires of the coil. This will induce a current to flow in the coil wire. At the wire ends a voltage will be generated. The rate of change of the flux, by increasing velocity of the magnet, will produce a higher voltage.

What is the purpose of transmitting power at high voltages over long distances? Electricity is transmitted at high voltages to reduce the energy loss due to resistance that occurs over long distances. Power is usually transmitted through overhead power lines.

How does moving the magnet faster affect the amount of induced current? Figure 20.33 Movement of a magnet relative to a coil produces electric currents as shown. The same currents are produced if the coil is moved relative to the magnet. The greater the speed, the greater the magnitude of the current, and the current is zero when there is no motion.

When the magnet is moved faster the maximum EMF increases? This is because the EMF in this case is due to induced electric field, not directly due to magnetic field. The faster the magnet moves, the higher the rate of change of magnetic field and the higher the induced electric field. This follows from the Faraday law of electromagnetism.

Will moving the magnet faster induce a bigger voltage? The faster the motion, the greater the voltage, and there is no voltage when the magnet is stationary relative to the coil. Figure 10.9. 2: Movement of a magnet relative to a coil produces voltage as shown. The same voltages are produced if the coil is moved relative to the magnet.

How does frequency affect induced voltage? According to Faraday's Law, in coupled inductors, the magnitude of the induced voltage at the secondary coil is proportional to primary power source's frequency ($V_2 = \omega \times I_1 \times M$).

How does the frequency of induced voltage relate to how frequently a magnet is plunged in and out of a coil of wire? Final answer: The frequency of the induced voltage in a coil is equal to the frequency of the motion of the magnet being plunged into and out of the coil. This is explained by Faraday's Law of electromagnetic induction.

How does the frequency of changing magnetic field compare with the frequency of the alternating voltage that is induced? In fact: frequency of the alternating voltage = frequency of changing magnetic field. Generator: when coil is rotated in a stationary magnetic field: ac voltage induced by the changing field within the loop.

What is the relationship between voltage and magnetic field? Since Current (I) is directly proportional to Voltage (V). Let us put this value of I on our formula of magnetic field. Now from the above formula we can say that magnetic field is directly proportional to Voltage (V). Hence, If we increase the voltage of a source then the magnetic field will also increase.

What is the induced voltage of a coil? The induced voltage can be calculated using the following formula: $\mathcal{E} = N \times \frac{d\phi}{dt}$, where \mathcal{E} is the induced voltage, N is the number of coil turns, ϕ is the magnetic flux, and dt is the time taken. The relationship between induced voltage and magnetic flux is another name for the aforementioned formula.

What is the polarity of the induced voltage? The polarity of an induced voltage can be determined using Lenz's Law and the right-hand rule. Lenz's Law states that the direction of the induced current is always such that it opposes the change in the magnetic field that produced it. This law is a consequence of the conservation of energy.

What happens to an electromagnet when you add more loops of wire? When you bend the wire into a coil, the magnetic fields around each loop of the coil add up

to make a long , thin magnet with north at one end and south at the other. The more loops the coil has, the stronger the magnetic field, while the current is flowing.

Will the electromagnet with 10 wire coils or 20 wire coils pick up more staples?

In Test 2 (2 batteries), the nail with 20 coils will again likely pick up the greater number of staples because more coils will allow more current to flow and should yield a stronger electromagnet.

Is an electromagnet stronger if there is more current flowing through it? An electromagnet is stronger if there are more turns in the coil of wire or there is more current flowing through it. A bigger bar or one made of material that is easier to magnetize also increases an electromagnet's strength.

What is the relationship between induced voltage and rate of change magnetic field? The amount of voltage induced depends on the rate of change of the magnetic field flux and the number of turns of wire (if coiled) exposed to the change in flux. Faraday's equation for induced voltage: $\epsilon = N(d\phi/dt)$

How does frequency affect induced voltage? According to Faraday's Law, in coupled inductors, the magnitude of the induced voltage at the secondary coil is proportional to primary power source's frequency ($V_2 = \omega \times I_1 \times M$).

What is the relationship between alternating current and magnetic field? The magnetic field intensity or strength is depended on the alternating current. Therefore high-current is needed to produce high AC magnetic field. An AC current driver such as the TS200 and the TS250 can output many amperes of current through an AC magnetic coil to produce the electromagnetic field.

How does changing frequency affect voltage? In a series circuit, as frequency increases, the current and voltage both increase, while the impedance also increases. This is because the components in a series circuit have a cumulative effect on the overall impedance, and at higher frequencies, this effect becomes more pronounced.

What is the relation between magnetic field magnetic induction and magnetization? Ans. Magnetisation, also known as magnetic polarisation, is the vector field that describes the frequency of permanent or generated magnetic dipole

moments in a magnetic substance. Ans. The induced magnetisation brings a non-magnetic substance under the influence of an external magnetic field to magnetise it.

How is induced emf different from induced current direction? The induced EMF will have been created by a “changing magnetic field.” What Lenz's law tells you is that if you allow the induced EMF to drive a current through a wire that will produce a magnetic field, the current will always flow in the direction that creates a field that opposes the field change that gave rise to ...

How does the induced voltage depend on the frequency of the current in the solenoid? The induced voltage in a solenoid is directly proportional to the frequency of the current. This is because a greater frequency increases the rate of change in magnetic flux, thus increasing the induced emf.

What does the frequency of voltage generated depend on in an alternator? Two factors affect the frequency in an alternator: rotation speed and the number of poles.

What are the principal differences between an MHD generator and a conventional generator? A coal-fueled MHD generator is a type of Brayton power cycle, similar to the power cycle of a combustion turbine. However, unlike the combustion turbine, there are no moving mechanical parts; the electrically conducting plasma provides the moving electrical conductor.

What does the induced emf in a circuit depend on? According to the Faradays law of induction, the magnitude of the induced EMF is nothing but the product of the number of turns of the winding and the rate of change of flux linkage in it. Hence, the induced EMF in a conductor depends on the rate of change of flux linkage.

What is the difference between a magnetic field produced by DC voltage and AC voltage? Basically, the difference between an AC and DC magnetic field are that a DC magnetic field emanates from the earth naturally that is what allows a compass to find magnetic North; while AC magnetic fields emanate from man made electrical systems (power lines, transformers, computers, and anything with an electric motor) ...

What is the relationship between magnetic field and induced current? An induced current is produced by a changing magnetic field. There is an induced emf

associated with the induced current. A current can be produced without a battery present in the circuit. Faraday's law of induction describes the induced emf.

What is the relationship between coil current and magnetic field? The strength of a coil's magnetic field increases not only with increasing current but also with each loop that is added to the coil. A long, straight coil of wire is called a solenoid and can be used to generate a nearly uniform magnetic field similar to that of a bar magnet.

What happens to the voltage across the capacitor as the frequency increases? It is true that the impedance of a capacitor is inversely proportional to frequency, and when the capacitor is part of a voltage divider network, the voltage across the capacitor will decrease with a frequency increase. This is true of some filter networks built from passive components, for example.

How does frequency affect motor torque? A frequency higher than the rated frequency usually improves the power factor but decreases locked-rotor torque and increases the speed and friction and windage loss. At a frequency lower than the rated frequency, the speed is decreased, locked-rotor torque is increased, and power factor is decreased.

What is the relationship between voltage and frequency? The frequency of the voltage is symbolized by f and given by $f = 1/T$. In terms of ω , $f = \omega/2\pi$, in hertz. The root-mean-square (rms) voltage of a sinusoidal source of electromotive force (V_{rms}) is used to characterize the source. It is the square root of the time average of the voltage squared.

Apa yg dimaksud finance accounting? Financial accounting atau akuntansi keuangan adalah suatu bidang dalam akuntansi yang bertanggung jawab untuk mencatat, menganalisis, dan melaporkan transaksi keuangan suatu entitas atau organisasi.

Apa yang dimaksud dengan basic accounting? Basic Accounting merupakan program pelatihan untuk memberikan pemahaman yang komprehensif tentang laporan keuangan. Dasar yang digunakan adalah Pernyataan Standard Akuntansi Keuangan (PSAK). Siapapun yang ingin sukses berbisnis wajib memahami dasar-dasar akuntansi, karena akuntansi adalah bahasa bisnis.

Financial accounting ada apa saja?

Apa beda nya finance dan accounting? Finance berfokus pada pengelolaan dana dan pengambilan keputusan investasi, sementara akuntansi bertanggung jawab untuk mencatat dan melaporkan data keuangan. Keduanya memiliki peran penting dalam mencapai tujuan keuangan perusahaan.

Accounting terdiri dari apa saja?

Apa perbedaan MYOB accounting dan basic? MYOB Business Basics yaitu software akuntansi untuk perusahaan skala kecil atau bisnis rumahan. MYOB Accounting yaitu software akuntansi untuk perusahaan dagang dan jasa.

Intermediate accounting itu apa? Pada dasarnya Intermediate Accounting (Akuntansi Menengah) merupakan pengetahuan yang menjembatani antara pengetahuan tentang Elementary Accounting (Pengantar Akuntansi) dengan Advance Accounting (Akuntansi Lanjutan).

Apa tugas finance accounting staff? Sebagai Accounting Staff, Anda akan bertanggung jawab memeriksa dan melakukan verifikasi transaksi keuangan perusahaan, melakukan pencatatan dan dokumentasi, serta bertugas menyusun laporan keuangan secara akurat.

Kerja Bagian finance itu apa? Melakukan transaksi keuangan perusahaan. Melakukan pembayaran kepada supplier. Berhubungan dengan pihak internal maupun eksternal terkait dengan aktivitas keuangan perusahaan. Mengontrol aktivitas keuangan / transaksi keuangan perusahaan.

Berapa gaji staff accounting? Apa yang bisa saya peroleh sebagai Akuntan? Gaji bulanan rata-rata untuk pekerjaan Akuntan di Indonesia berkisar dari Rp 4.560.000 hingga Rp 6.580.000.

Berapa gaji staf finance? Kisaran gaji staff finance di Indonesia bervariasi tergantung pada ukuran perusahaan, lokasi, dan tingkat pengalaman. Pada umumnya, posisi entry-level dapat memperoleh gaji mulai dari Rp4.000.000 hingga Rp8.000.000 per bulan, sementara posisi manajerial atau senior dapat mencapai Rp20.000.000 atau lebih per bulan.

How to boost your IQ?

Does raise your IQ work? Although science is on the fence about whether you can raise your IQ or not, research does seem to suggest that it's possible to raise your intelligence through certain brain-training activities. Training your memory, executive control, and visuospatial reasoning can help to boost your intelligence levels.

How much can you increase your IQ by? According to the Flynn effect, IQ improved over 20th century by about 20-25 IQ degrees. IQ training studies show that IQ improves because of training by up to 8-10 degrees. The problem is that most of it fades out in 2-3 years after the end of the study.

Can you train IQ tests? Although it is possible to enhance one's score by practice, or even cheat, overall the IQ test still remain good predictors. As a comparison it is good to know that, if one really wants to, one can enhance or manipulate one's score on almost every test or self-report measure in Psychological research.

Can IQ increase with age? However the intelligence ability is changing during the life, the IQ (intelligence quotient) does not. This measure is defined to have mean of 100 in each age group. So the average IQ e.g. in the age 5 is 100, and the same in the age 50.

Can low IQ be improved? Some researchers have even found that rigorous academic curricula can lead to improved IQ scores. Teens' personalities, work ethic and the home environments are important, too.

What is an average IQ? Important Considerations. On many tests, a score of 100 is considered the average IQ. Sixty-eight percent of scores fall within one standard deviation of the mean (that is, between 85 and 115). That means that nearly 70% of all people score within plus or minus 15 points of the average score.

Who has the highest IQ in the world?

How to check IQ level at home? One of the most well-known online exams available to you is Free-IQTest.net. It has 20 questions that will measure your IQ score accurately. After this test, you have to give your birth date since the test calculates your IQ score based on your age. This way, you may compare yourself to

your peers.

What is Elon Musk's IQ? Elon Musk's IQ is 160. This estimation is based on high correlation of SAT and IQ. The analysis to estimate his IQ score is grounded in scientific rigor and advanced statistical methods.

What is Einstein's IQ? The IQ of Albert Einstein remains a subject of speculation since he never took an IQ test. However, based on historical records, Einstein's estimated IQ is around 160. Despite the absence of concrete data, Einstein's genius is undisputed, given his profound contributions to science.

What is IQ of Bill Gates? Bill Gates's IQ is 157 ± 6 , according to our mathematical analysis based on SAT score averages. With a correlation coefficient of 0.8 between SAT scores and IQ, this approach provides a trustworthy approximation. What is Einstein IQ?

What is the minimum IQ to get into Mensa? The minimum accepted score on the Stanford–Binet is 132, while for the Cattell it is 148, and 130 in the Wechsler tests (WAIS, WISC). Most IQ tests are designed to yield a mean score of 100 with a standard deviation of 15; the 98th-percentile score under these conditions is 130.8, assuming a normal distribution.

Is a 120 IQ good? An IQ level of 120 would be described as 'above average or bright' on an IQ scale. The average score is 100, and 68% of all people have scores between 85 and 115. What is a good IQ score? Any IQ score above 116 would be considered above average.

Is IQ genetic? Intelligence in the normal range is a polygenic trait, meaning that it is influenced by more than one gene, and in the case of intelligence at least 500 genes. Further, explaining the similarity in IQ of closely related persons requires careful study because environmental factors may be correlated with genetic factors.

What is a normal IQ for a 70 year old? The mean WAIS-IV IQ is 100 for ages 20-24 and is 99 for ages 25-44. Then it drops to 97 for ages 45-54, to 94 for ages 55-64, to 90 for 65-69, to 86 for ages 70-74 and to 79 for ages 75+.

What IQ is considered genius?

At what age is IQ the highest? It is well known that intelligence throughout life varies irregularly. The largest increase in human IQ is observed from 2 to 12 years and at the age of 19-20 IQ reaches its maximum.

What habits increase IQ? Engaging in activities that challenge the mind, such as puzzles, chess, or learning a new language, stimulates neural pathways, improves memory, and enhances cognitive flexibility.

What can cause a low IQ? It can be associated with a genetic syndrome, such as Down syndrome or Fragile X syndrome. It may develop following an illness such as meningitis, whooping cough or measles; may result from head trauma during childhood; or may result from exposure to toxins such as lead or mercury.

How to increase IQ by 50 points? Challenge your brain by breaking your routines, reading, solving puzzles, and seeking new experiences to increase your IQ. Supplement your efforts by getting plenty of protein, vitamin B, and rest, all of which enhance your brain's ability to remain alert. The right diet and lifestyle can do wonders.

What creates high IQ? Genetic Contributions to High Intelligence Quotient Research indicates that between 40% and 80% of the variance in IQ is attributed to genetics, highlighting a significant hereditary component. These findings emerge from studies of family pedigrees, twin studies, and recently, advances in molecular genetics.

Is 130 IQ good? 85 to 114: Average intelligence. 115 to 129: Above average or bright. 130 to 144: Moderately gifted. 145 to 159: Highly gifted.

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Seismic Design Guidelines for Port Structures: A Q&A

1. What is the purpose of seismic design guidelines for port structures?

Seismic design guidelines provide a framework for engineers to design port structures that can withstand the forces generated by earthquakes, ensuring the safety and functionality of these critical infrastructure elements.

2. Who developed the most recent guidelines?

The Permanent International Association of Navigation Congresses (PIANC) recently published the "Seismic Design Guidelines for Port Structures" (2020). PIANC is a global organization dedicated to promoting knowledge and best practices in navigation and port engineering.

3. What are the key principles of the guidelines?

The guidelines emphasize the importance of considering the specific seismic hazards at each port, including the magnitude, frequency, and duration of earthquakes. They also advocate for a holistic approach to seismic design, considering the interactions between different components of the port structure and the surrounding environment.

4. How can engineers use the guidelines?

The guidelines provide detailed guidance on various aspects of seismic design, including:

- Site characterization and evaluation of seismic hazards
- Selection of appropriate seismic design codes and methodologies
- Design of individual port structure components (e.g., wharves, breakwaters)
- Evaluation of soil-structure interaction effects
- Risk assessment and mitigation measures

5. What are the benefits of using the guidelines?

By following the PIANC Seismic Design Guidelines, engineers can:

- Enhance the seismic resilience of port structures
- Minimize damage and downtime during earthquakes
- Protect critical infrastructure and reduce economic losses
- Comply with industry best practices and regulatory requirements

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