أسئلة المراجعة النهائية على شاكلة الامتحان النهائي

تاريخ إضافة الملف على موقع المناهج: 2024-06-09 13:55:50

إعداد: Zewin Adham

التواصل الاجتماعي بحسب الصف الثاني عشر المتقدم

اضغط هنا للحصول على جميع روابط "الصف الثاني عشر المتقدم"

روابط مواد الصف الثاني عشر المتقدم على تلغرام

الرياضيات	اللغة الانجليزية	اللغة العربية	التربية الاسلامية

المزيد من الملفات بحسب الصف الثاني عشر المتقدم والمادة فيزياء في الفصل الثالث

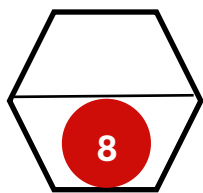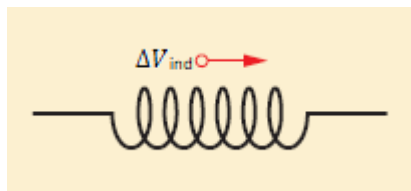|	
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Question	(1)	السؤال

The figure shows an emf ΔV_{ind} induced in a solenoid.

a. Complete the table to describe the current through the solenoid:

Direction of current	(increasing, decreasing or constant)

b. If A 12 H inductor carries a current of 2.0 A. At what rate must the current be changed to produce a 60 V in the inductor?

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c. Find the magnetic energy stored in the solenoid.

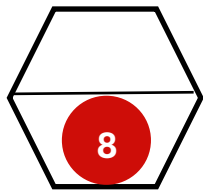---
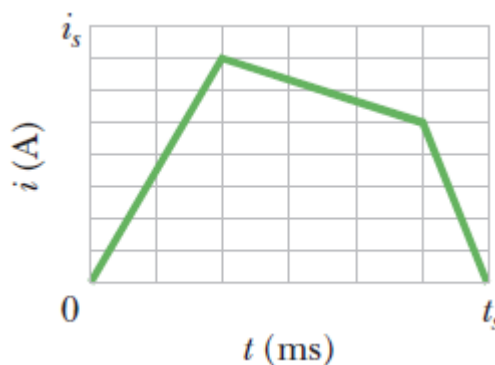
| | Question | (2) | السؤال |

8

The current _i_ through a 4.6 H inductor varies with time _t_ as shown by the graph, where the vertical axis scale is set by i_s = 8.0 A and the horizontal axis scale is set by t_s = 6.0 ms. The inductor has a resistance of 12 Ω .

i (A) vs t (ms)

Find the magnitude of the induced ΔV_{ind} during time intervals

(a) 0 to 2 ms,

(b) 2 ms to 5 ms

(c) 5 ms to 6 ms.
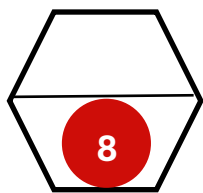
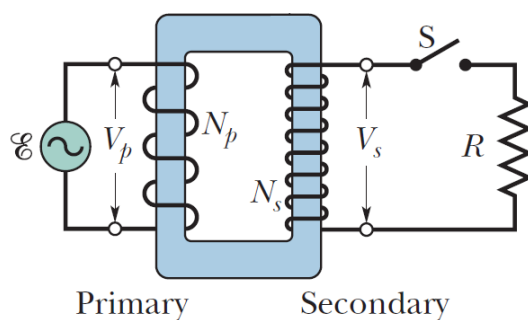
| | **Question** | **(3)** | **السؤال** |

Primary   Secondary

Use the words [yes, No or No change] to complete the following table

	With switch S open	**With switch S closed**
voltage V_p		
current I_s		
current I_p		

If the primary coil is connected to an AC voltage source providing 240 V, and the switch S is closed connecting the secondary coil to a resistive load R=20 Ω:

a) What is the voltage across the secondary coil?

----

b) What is the current through the resistive load R?

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c) What is the power delivered to the resistive load?

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d) if the efficiency of the transformer changed from 100% to 97%. What is the power delivered to the resistive load?

| | Question | (4) | السؤال |

8
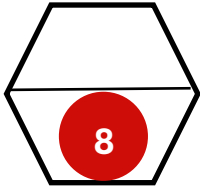
A circuit contains a capacitor, with C = 1.50 μF, and an inductor, with L = 5.30 mH
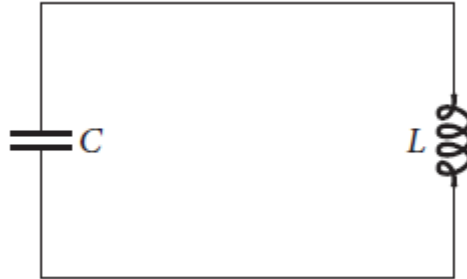
The capacitor is fully charged using a 18.0-V battery and is then connected to the circuit.

Problems

a) What is the angular frequency of the circuit?

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b) What is the total energy in the circuit?

----

c) What is the charge on the capacitor after t = 3.00 s?
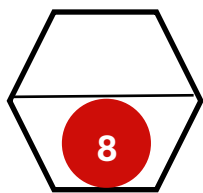
| | Question | (5) | السؤال |

A metal rod is forced to move with constant velocity *v* along two parallel metal rails, connected with a strip of metal at one end. A magnetic field of magnitude B = 0.350 T points out of the page.
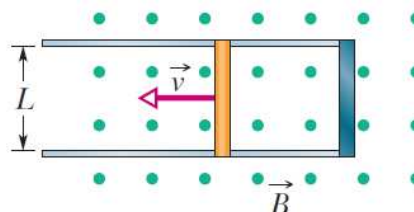
(a) If the rails are separated by *L* = 25.0 cm and the speed of the rod is 55.0 cm/s, what emf is generated?

(b) If the rod has a resistance of 18.0 Ω and the rails and connector have negligible resistance, what is the current in the rod?

(c) At what rate is energy being transferred to thermal energy?

| | **Question** | **(1)** | السؤال |

A 500-turn circular coil with an area of 1.54×10^{-2} m^2 is perpendicular to a 0.060 T field. The magnetic field changes to 0.020 T in the opposite direction in 0.12 s.

$B_0 = 0.060$ T

$B = 0.020$ T

Initial   Final
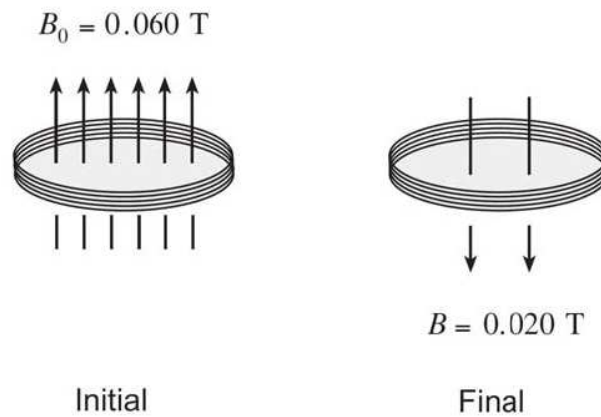
What is the average emf induced in the coil?

A. 5.1×10^{-3} V
B. 1.0×10^{-2} V
C. 2.6 V
D. 5.1 V

| | Question | (1) | السؤال |

What will be the possible magnet pole and type of motion to produce an induced current in fig.b

(a)   (b)
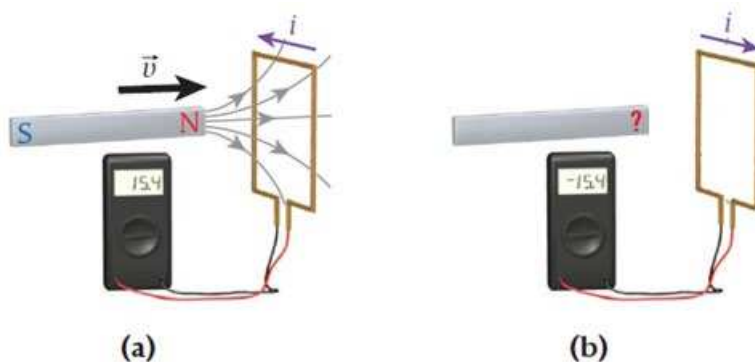
	pole	Type of motion
A	N	$\longrightarrow$
B	S	No motion
C	N	$\longleftarrow$
D	S	$\longleftarrow$

A circular area with a radius of 6.50 cm. What is the magnitude of the angle θ If a magnetic field 0.23 T paths through the area as shown producing magnetic flux of 1.83 mWb
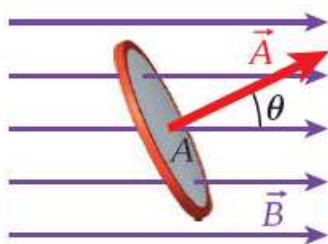
	Angle **θ**
A	25.4°
B	53.1°
C	30°
D	36.9°

| | Question | (1) | السؤال |

circular coil of wire with 20 turns is laying flat on a horizontal tabletop as shown in the figure. There is a uniform magnetic field extending over the entire table with a magnitude of 5.00 T making an angle of 25.8° with the horizontal. **What is the magnitude of coil radius** if the magnetic flux through the coil is 21.9 T m²
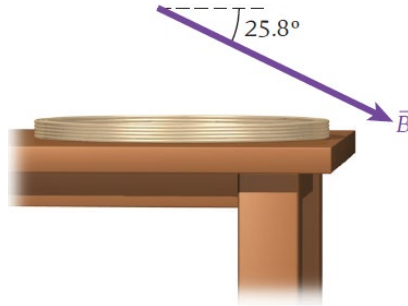
	Radius (r)
A	60 cm
B	40.0 cm
C	1600 cm
D	2 cm

Which of the following is not a correct unit of magnetic flux?

A	H.A/s
B	V.s
C	H.A
D	T.m²

| | Question | (1) | السؤال |

Q. Which of the following equations represent the Gauss's law for magnetic fields?

A. $\Delta V_{ind} = vlB$

B. $\Delta V_{ind} = -N\dfrac{d\phi_B}{dt}$

C. $\oint B \cdot dA = 0$

D. $\oint \vec{E} . d\vec{s} = -\dfrac{d\phi_B}{dt}$

The plane of the circular loop shown in the figure is perpendicular to a magnetic field with magnitude B = 0.500 T. The magnetic field goes to zero at a constant rate in 0.250 s. The induced voltage in the loop is 1.24 V during that time. What is the radius of the loop and the dirextion of induced current?
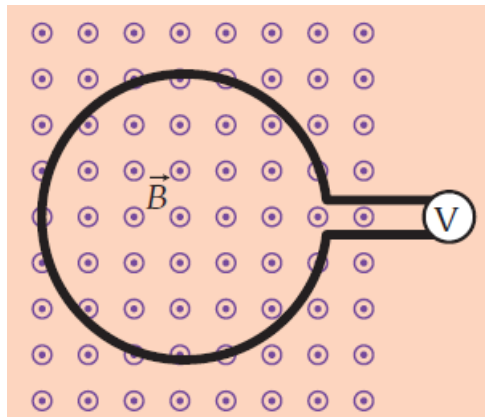
	Radius (cm)	Direction of induced current
A	78.7	Clockwise
B	44.4	counterclockwise
C	88.8	Clockwise
D	1971.4	counterclockwise

	Question	(1)	السؤال

Which of the following diagrams is not correct according to Lenz s Law?
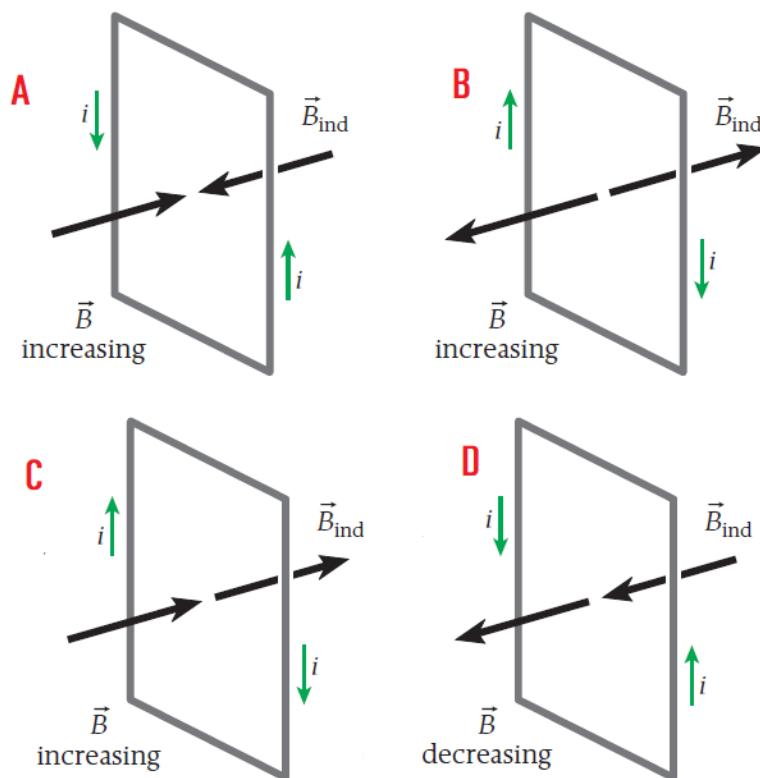
A long wire carries a current, *i*, as shown in the figure. A square loop moves in the same plane as the wire, as indicated. In which cases will the loop have an induced current?

a) cases 1 and 2

b) cases 1 and 3

c) cases 2 and 3

d) None of the loops will have an induced current.

e) All of the loops will have an induced current.
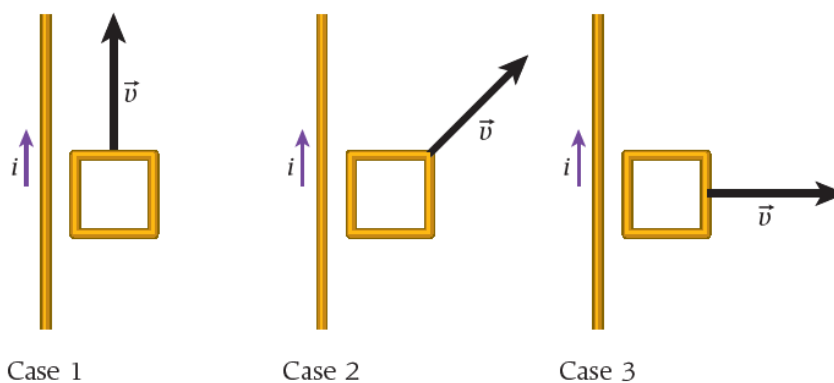
| | Question | (1) | السؤال |

Look at the following fig and determine Which of the following is NOT true for Induced potential difference as a function of time.
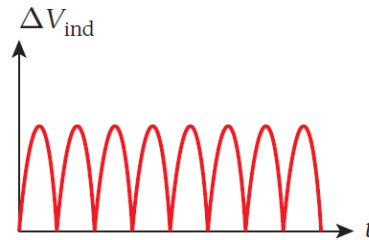
A. This curve is the output voltage as a function of time for DC generator
B. The working principle of generator is based on electromagnetic induction.
C. The generator structure has two have slip-rings
D. The generator structure has commutator to make the current flow in one direction only.

The current in the wire is given by the equation $I = 2.5 - 0.6t$, with positive to the right as shown. Which of the statements concerning the current induced in the loop is correct?
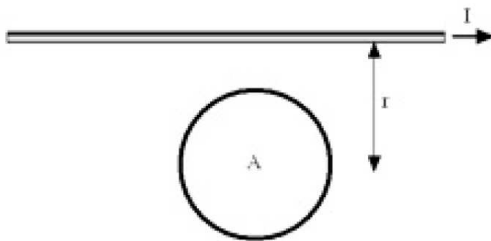
a. There is no induced current.
b. The current is clockwise always.
c. The direction of current depends on the value of r.
d. The current is first clockwise then counterclockwise.
e. The direction of current depends on the value of A.

| | Question | (1) | السؤال |

The figure shows the current through a 10-mH inductor. What is maximum magnitude of the potential difference ΔV_L across the inductor over the period shown?

a. 20 V
b. 40 V
c. 60 V
d. 60 mV
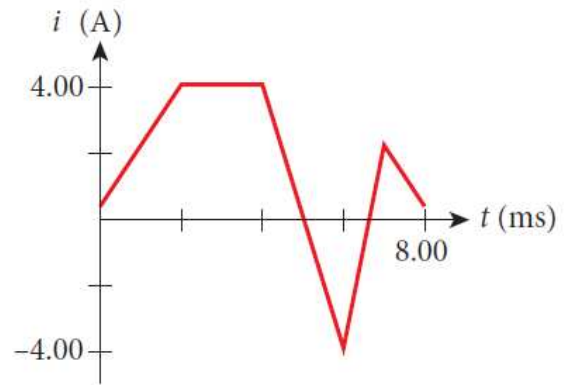
What will happen to the inductance of a solenoid when the number of turns and the length are doubled, keeping the area of cross-section same?

A $\dfrac{L}{2}$

B   L

C   2L

D   4L

Question	(1)	السؤال

The graph represent the changes in the potential that is produced by an AC generatoure, which equation represent these changes?

يمثل الرسم البياني تغيرات فرق الجهد الكهربائي الذي يتم توليده بواسطة مصدر جهد متردد، أي المعادلات التالية تمثل تلك التغيرات؟

A. $\Delta V_{ind} = 6.0\ Sin(4\pi t)$
B. $\Delta V_{ind} = 12\ Sin(4\pi t)$
C. $\Delta V_{ind} = 12\ Cos(8\pi t)$
D. $\Delta V_{ind} = 12\ Sin(8\pi t)$
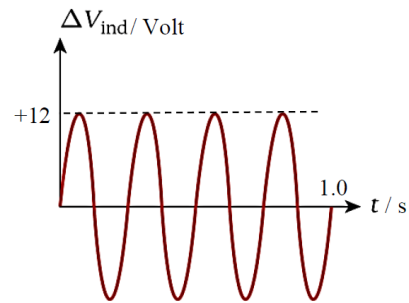
In the figure shown, the field is decreasing by 150 T/s. What is the magnitude of the current in amperes?
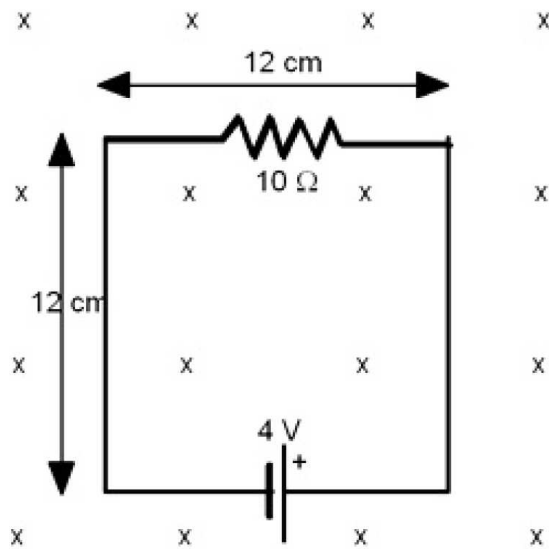
a. 0.18
b. 0.22
c. 0.40
d. 0.62

Question	**(1)**	السؤال

An AC power supply puts out a voltage V = 170 sin(2π60t) and is connected to a resistor R = 20 Ω. \What is **the power in W dissipated in the resistor?**
a. 100
b. 310
c. 720
d. 1000
e. 2000

A transformer with 300 turns on its primary coil and 30 turns on its secondary coil is designed to deliver an average power of 600 W with a peak voltage of 24 V. **What is the peak current in the primary coil?**
a. 2.5 A
b. 5.0 A
c. 7.5 A
d. 10.0 A
e. 15.0 A

The total amount of energy stored in an *LC* series circuit is 8.00 J. When the current through the inductor is equal to half its maximum value, **how much energy is stored in the electric field?**
a. 2.00 J
b. 4.00 J
c. 6.00 J
d. 8.00 J

| Question | (1) | السؤال |

11- What is the phase difference between the voltage and the current through the resistor?

ما فرق الطور بين فرق الجهد عبر المقاوم والتيار المتدفق عبر المقاوم؟

A. $\Phi = \pi$
B. $\Phi = -\pi/2$
C. $\Phi = \pi/2$
D. $\Phi = $ zero

12- How can the disipated power through the transmission lines reduce?

كيف يمكن تقليل الطاقة المبددة من خلال خطوط النقل؟

A. By increasing the voltage to the highest possible value.
B. By reducing the voltage in the transmission lines.
C. By increasing the current in the transmision lines.
D. By reducing the produced power.

13- The transmission of electric power occurs at the highest possible voltage to reduce losses. By how much could the power loss be reduced by raising the voltage by a factor of 5.0?

تتم عملية نقل الطاقة الكهربائية عند أعلى جهد ممكن لتقليل الفقد. ما مقدار الفقد في الطاقة الذي يمكن تقليله برفع الجهد بمعامل 5.0؟

A. It will reduce by a factor of 5
B. It will reduce by a factor of 10
C. It will reduce by a factor of 15
D. It will reduce by a factor of 25

14- A power station produces 12 MW of power and is transported by an electrical voltage of 450 KV.what is the disipated power in transmission lines if they are 110 Ω resistance?

تنتج محطة طاقة ، قدرة كهربائية مقدارها 12 MW، ويتم نقلها عبر خطوط النقل بواسطة جهد كهربائي مقداره 450 KV ما مقدار القدرة المبددة في أسلاك النقل إذا كانت مقاومتها 110 Ω؟

A. 6.5×10^4 W
B. 7.8×10^4 W
C. 9.1×10^4 W
D. 9.6×10^4 W

| | Question | (1) | السؤال |

A power plant produces 1000MW to supply a city 40km away. Current flows from the power plant on a single wire with resistance 50mΩ/km, through the city, and returns via the ground, which has negligible resistance. At the power plant the voltage between wire and ground is 115kV.

Find (a) the current in the wire and

      (b) the fraction of the power lost in transmission.

$R = 50m\Omega/km * 40km = 2000m\Omega = 2\Omega$ and power,

$P = 1000MW = 10^9\,W$.

$I = P/V$ $I = 10^9\,W/115 \times 10^3\,V$ which results in $I = 8695\,A$

$P_{lost} = I^2R$ $P_{lost} = 1.51 \times 10^8\,W$ or 151 MW.

$P_{lost}/P = 151MW/1000MW = 0.151$ or 15.1%.

| | Question | (1) | السؤال |

A bar magnet is moving toward a solenoid.
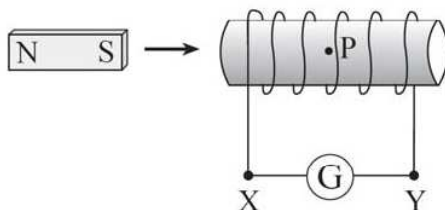
What is the direction of the current through the galvanometer and what is the direction of the magnetic field produced by this current at location P inside the solenoid?

	DIRECTION OF THE CURRENT THROUGH THE GALVANOMETER	DIRECTION OF THE MAGNETIC FIELD AT P
A.	From X to Y	Right
B.	From X to Y	Left
C.	From Y to X	Right
D.	From Y to X	Left

The wire in the figure carries a current _I_ that is increasing with time at a constant rate. The wire and the three loops are all in the same plane. What is true about the currents induced in each of the three loops shown?
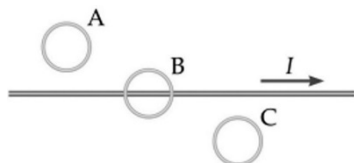
A) No current is induced in any loop.
B) The currents are counterclockwise in all three loops.
C) The currents are clockwise in all three loops.
D) Loop A has clockwise current, loop B has no induced current, and loop C has.

	Question	**(1)**	السؤال

A metal bar is moving with constant velocity $\vec{v}$ through a uniform magnetic field pointing into the page, as shown in the figure.
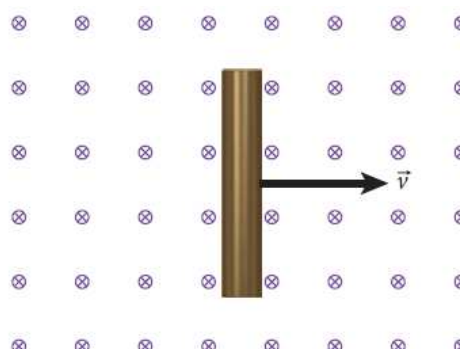
Which of the following most accurately represents the charge distribution on the surface of the metal bar?

a) distribution 1

b) distribution 2
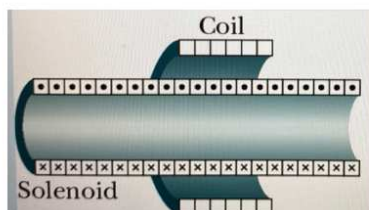
c) distribution 3

d) distribution 4

e) distribution 5

Distribution 1

Distribution 2

Distribution 3

Distribution 4

Distribution 5
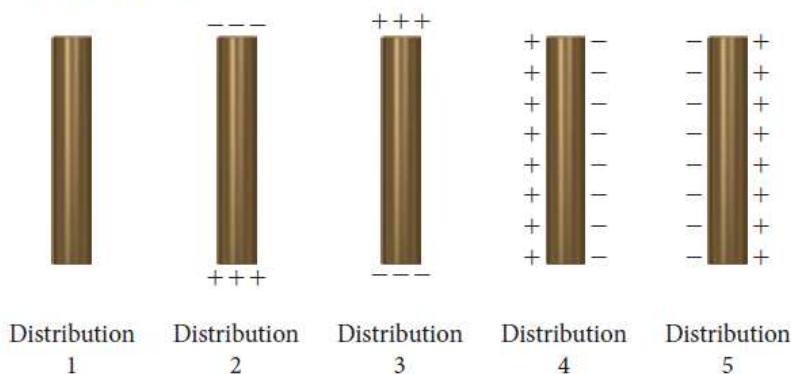
29.10 A long solenoid with a circular cross section of radius $r_1 = 2.80$ cm and $n = 290$ turns/cm is inside of and coaxial with a short coil that has a circular cross section of radius $r_2 = 4.90$ cm and $N = 31$ turns. Suppose the current in the short coil is increased steadily from zero to $i = 2.80$ A in 18.0 ms. What is the magnitude of the potential difference induced in the solenoid while the current in the short coil is changing?

a) 0.0991 V

b) 0.128 V

c) 0.233 V

d) 0.433 V

e) 0.750 V

لـ لولبي طويل ذو مقطع عرضي دائري نصف قطره $r_1 = 2.80$ cm داخل ملف قصير ذي مقطع عرضي دائري نصف قطره cm/ ولـ $N = 31$ لفة ومتحد معه في المحور. افترض أن التيار المار في الملف r_2 بات من الصفر إلى $i = 2.80$ A في 18.0 ms. كم يبلغ مقدار فرق في الملف اللولبي عندما يتغير التيار المار في الملف القصير؟

0.750 V (e

0.233 V (c

0.433 V (d

Coil

Solenoid

G12 Advanced	Physics Final Revision	الفيزياء – المراجعة النهائية	T3 – 2023 - 2024

Question	(1)	السؤال

The figure shows the current through a 10-mH inductor. **What is maximum magnitude of the potential difference ΔV_L across the inductor over the period shown?**	يوضح الشكل التيار مع الزمن المار خلال محث معامل حثه 10 mH ما أقصى فرق الجهد ΔV_L عبر المحث خلال الفترة الموضحة؟

a. 20 V
b. 40 V
c. 60 V
d. 60 mV

The figure shows the current through an inductor. If the maximum magnitude of the potential difference ΔV_L across the inductor over the period shown is 60 V, **what is the inductance of the inductor?**	يوضح الشكل التيار مع الزمن المار خلال محث **ما معامل حثه** اذا كان أقصى فرق الجهد ΔV_L عبر المحث خلال الفترة الموضحة هو 60 V؟

a. 100 mH
b. 1 mH
c. 10 mH
d. 1 H

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Question	(1)	السؤال

A loop of wire lies motionless on a flat, horizontal surface in the presence of a uniform and constant magnetic field. <u>When is the magnetic flux through the area interior to the loop the largest?</u>

a. when the magnetic field is parallel to the
   area interior to the loop

b. when the magnetic field is perpendicular to
   the area interior to the loop

c. when the magnetic field is only exists
   exterior to the loop

d. None are correct.

تقع حلقة من السلك بلا حراك على سطح أفقي مسطح في وجود مجال مغناطيسي منتظم وثابت. <u>متى يكون التدفق المغناطيسي عبر المنطقة الداخلية للحلقة أكبر</u>

أ. عندما يكون المجال المغناطيسي موازيًا للمنطقة الداخلية للحلقة

ب. عندما يكون المجال المغناطيسي عموديًا على المنطقة الداخلية للحلقة

ج. عندما يكون المجال المغناطيسي موجودًا خارج الحلقة فقط

د. لا شيء صحيح.

If a magnet is moved toward a wire loop faster, what happens to the induced current?
- A. It decreases
- B. It remains the same
- C. It increases
- D. It changes direction

| | Question | (1) | السؤال |

Solenoid two is twice as long and has twice as many turns of wire as solenoid one. Both solenoids have the same cross-sectional area. What is the ratio of the inductance of solenoid two to the inductance of solenoid one?

a. 1

b. 2

c. 4

d. 8

الملف اللولبي 2 له ضعف طول وضعف عدد لفات الأسلاك الملف اللولبي 1 كلا الملفين اللولبيين لهما نفس مساحة المقطع العرضي. **ما هي نسبة حث الملف اللولبي 2 إلى حث الملف اللولبي 1؟**

أ. 1

ب. 2

ج. 4

د. 8

A long solenoid of length 2.0 m and n = 300 turns/m carries a current of 4.0 A. It stores an energy of 3.4 J.
What is the cross sectional area of the solenoid?

a. 0.70 m^2

b. 1.2 m^2

c. 1.4 m^2

d. 1.9 m^2

ملف لولبي طويل بطول 2.0 m و 300 = n turns/m يحمل تيارًا قدره 4.0 A. يخزن طاقة مقدارها 3.4 J.
ما هي مساحة المقطع العرضي للملف اللولبي؟

a. 0.70 m^2

b. 1.2 m^2

c. 1.4 m^2

d. 1.9 m^2

	Question	(1)	السؤال

In Faraday's law, what does the negative sign in the equation indicate?
- A) The direction of the induced emf opposes the change in magnetic flux
- B) The induced emf is decreasing over time
- C) The magnetic field is weakening
- D) The current flows counterclockwise

What is the incorrect unit used to measure magnetic flux?
- A) $T.m^2$
- B) Weber
- C) N.m/A
- D) $N.m^2/A$

What does Lenz's Law state about the direction of an induced current?

A) It always flows in a direction to increase the change in magnetic flux that induces it

B) It always flows in a direction to decrease the change in magnetic flux that induces it

C) It flows in a direction to oppose the change in magnetic flux that induces it

D) It flows in the same direction as the magnetic flux change

	Question	(1)	السؤال

$$\oint \vec{E} \cdot d\vec{s} = -\frac{d\Phi_B}{dt}$$

If the path connecting them is a closed loop, V_i and V_f are identical so...

$$\oint \vec{E} \cdot d\vec{s} = 0$$

take $R = 8.5$ cm and $dB/dt = 0.13$ T/s.

(a) Find an expression for the magnitude E of the induced electric field at points within the magnetic field, at radius r from the center of the magnetic field. Evaluate the expression for $r = 5.2$ cm.

Circular path
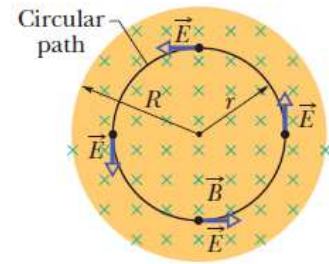
$$\oint \vec{E} \cdot d\vec{s} = \oint E \, ds = E \oint ds = E(2\pi r)$$

$$\Phi_B = BA = B(\pi r^2)$$

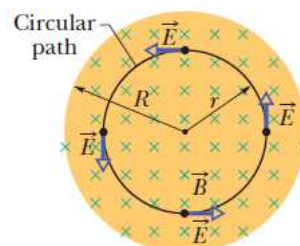$$E(2\pi r) = (\pi r^2)\frac{dB}{dt}$$

$$E = \frac{r}{2}\frac{dB}{dt}.$$

$$E = \frac{(5.2 \times 10^{-2}\,\text{m})}{2}(0.13\,\text{T/s})$$
$$= 0.0034\,\text{V/m} = 3.4\,\text{mV/m}.$$

(b) Find an expression for the magnitude E of the induced electric field at points that are outside the magnetic field, at radius r from the center of the magnetic field. Evaluate the expression for $r = 12.5$ cm.

$$E = \frac{R^2}{2r} \frac{dB}{dt}$$

$$E = \frac{(8.5 \times 10^{-2}\text{ m})^2}{(2)(12.5 \times 10^{-2}\text{ m})} (0.13\text{ T/s})$$
$$= 3.8 \times 10^{-3}\text{ V/m} = 3.8\text{ mV/m}.$$

Question	(1)	السؤال

When can we use the equation ($\Delta V_{ind} = \omega AB\sin\theta$) to find the induced potential difference?	متى يمكننا استخدام العلاقة : ($\Delta V_{ind} = \omega AB\sin\theta$) لإيجاد فرق الجهد المستحث ؟
A, B, and θ are constant A و B و θ ثوابت	A and B are constant A و B ثابتان
A and θ are constant A و θ ثابتان	θ and B are constant θ و B ثابتان

Which of the following is not correct about the generator and motors?	أي مما يلي غير صحيح للمولدات والمحركات؟
The motors transform kinetic energy into electric energy المحركات تحول الطاقة الحركية إلى طاقة كهربائية	
Generators and motors contain loops in a magnetic field المولدات والمحركات تحتوي على حلقات داخل مجال مغناطيسي	
Generators are applications of electromagnetic induction and motors are applications of electromagnetic force المولدات تعتبر تطبيقاً على الحث الكهرومغناطيسي والمحركات يعتبر تطبيقاً على القوة الكهرومغناطيسية	
Generator that produce alternating voltages and the resulting alternating current is also called an alternators المولدات التي تنتج جهدا مترددا ينشأ عنه تيار متردد تسمى كذلك مولدات التيار المتردد	

Which of the following is correct about the generator and motors?	أي مما يلي صحيح للمولدات والمحركات؟
The motors transform kinetic energy into electric energy المحركات تحول الطاقة الحركية إلى طاقة كهربائية	
Generators contain loops in a magnetic field but motors do not المولدات تحتوي على لفات داخل مجال مغناطيسي بينما لا تحتوي المحركات على لفات	
Motors are applications of electromagnetic induction but generators are not المحركات تعتبر تطبيقاً على الحث الكهرومغناطيسي بينما المولدات لا تعتبر تطبيقاً على الحث الكهرومغناطيسي	
Generator that produce alternating voltages and the resulting alternating current is also called an alternators المولدات التي تنتج جهدا مترددا ينشأ عنه تيار متردد تسمى كذلك مولدات التيار المتردد	

| | | Question | (1) | السؤال |

positive charge moving in a circular path in an electric field, the induced potential difference can be expressed as $(\Delta Vind = 2\pi xE)$. What does x represent?	لِشحنة موجبة تتحرك في مسار دائري داخل مجال كهربائي، يمكن التعبير عن فرق الجهد المستحث بالمعادلة $(\Delta Vind = 2\pi xE)$ ماذا تمثل x؟
The radius of the circular path نصف قطر المسار الدائري	Induced electric field المجال الكهربائي المستحث
The magnitude of the charge مقدار الشحنة الكهربائية	Induced electric current التيار الكهربائي المستحث

positive charge moving in a circular path in an electric field, the work done can be expressed as $(W = 2\pi rxE)$. What does x represent?	لِشحنة موجبة تتحرك في مسار دائري داخل مجال كهربائي، يمكن التعبير عن الشغل المبذول بالمعادلة $(W = 2\pi rxE)$ ماذا تمثل x؟
Induced potential difference فرق الجهد المستحث	The velocity of the charge السرعة التي تتحرك بها الشحنة
The magnitude of the charge مقدار الشحنة الكهربائية	Induced electric current التيار الكهربائي المستحث

What does the unit of inductance Henry (H) equal?	ماذا تساوي وحدة قياس معامل الحث هنري (H)؟
$\dfrac{1A^2m^2}{1T}$	$\dfrac{1Tm^2}{1A}$
$\dfrac{1T^2m}{1A}$	$\dfrac{1Am^2}{1T}$
Which of the following are units for inductance?	أي من التالية ليست من وحدات قياس معامل الحث الذاتي ؟
$T.m^2/A$	J/A^2
H	V.s

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