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PHYSICS · EAPCET (EAMCET)

Electromagnetic Induction

Previous Year Questions with answers

181 questions · **138** papers · **2010–2026** · newest paper first

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What is in this PDF: every Electromagnetic Induction question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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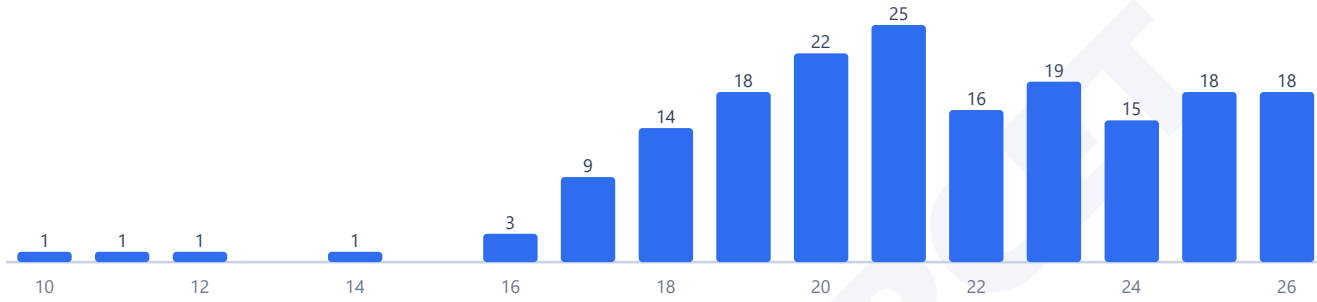
Chapter at a glance

2.8%	181	72 of 77	181 / 0
of Physics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 1.1 questions per paper in 2024–2026 against 1.1 in 2022–2023.

Questions per year



Counts are the questions we hold: 181 in 138 papers. 4 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2010–2026)

Inductance	67
Faraday's & Lenz's Laws	62
Motional EMF	34
LR & LC Circuits	18

How often it comes up

Electromagnetic Induction serves as an indispensable bridge connecting magnetic fields with alternating currents in Class 12 physics. Across AP and TS EAPCET papers spanning 2022 to 2026, the chapter contributed 86 questions across 77 papers. That gives an average frequency of 1.1 questions per paper, making up 2.8% of all physics questions in that recent window. Taking into account the complete archive from 2010 to 2026, Electromagnetic Induction brought 181 questions across 149 papers (1.2 questions per paper, 3.0% subject share). In the prior span between 2010 and 2021, we track 95 questions across 72 papers (3.3% share). In the last three exam years from 2024 to 2026, the chapter delivered 51 questions across 46 papers, registering a 2.8% share. Over the longer baseline, the share of the subject in the last three years compared to early papers is down, while compared to the recent five-year window it is about the same.

State-wise breakdowns reveal higher question density in Telangana compared with Andhra Pradesh. Between 2022 and 2026, AP EAPCET papers in our set contributed 49 questions across 48 papers, with 44 papers containing questions (1.0 per paper, 2.6% share). Over the same window, TS EAPCET papers provided 37 questions across 29 papers in our set, with 28 papers carrying questions (1.3 per paper, 3.2% share). Electromagnetic Induction has appeared every year since 2022, though across all 77 recent papers in our collection, five sittings omitted it, meaning it was not present in all 77 sittings. The chapter ranks 18th of 28 physics chapters by question share between 2022 and 2026. The busiest single sitting in our collection was 2021, which produced 25 questions across 17 papers.

Most-asked topics

Questions distribute across four distinct syllabus areas:

- **Inductance**: This leading section brought 36 questions between 2022 and 2026, contributing to 67 questions across all years in our archive. It tests self-inductance of solenoids, mutual inductance of concentric coils,

magnetic energy density B^2 / (two μ_zero), and back-emf induced in chokes.

- **Faraday's & Lenz's Laws**: Recent examinations supplied 31 questions, out of 62 questions in the complete record. Key concepts cover rate of magnetic flux change, induced electromotive force, direction of induced currents via Lenz's law, and total charge circulation through closed loops.
- **Motional EMF**: A block of 14 questions appeared in the recent five-year span, out of 34 questions overall. Topics include conducting rods sliding on parallel rails, rotating rods or metallic discs in perpendicular fields, and aircraft wing emfs.
- **LR & LC Circuits**: A focused pool of 5 questions appeared recently, out of 18 questions across the entire archive. Questions examine inductive time constants τ = L / R, current growth and decay, and energy oscillations in LC tank circuits.

What the questions look like

Motional electromotive force and rotating conductors provide standard numerical configurations. A frequent problem involves a conducting rod of length L pivoted at one end and rotating with steady angular velocity ω in a uniform perpendicular magnetic field B, requiring students to compute the potential difference developed between pivot and rim. Another common variant asks for the external mechanical power needed to pull a conducting bar at constant velocity along frictionless rails across a magnetic field, verifying that mechanical power input exactly equals Joule heating dissipation.

Faraday's law problems often connect graphical analysis with physical principles. Students are shown an induced current versus time graph or magnetic flux curve and asked to determine total circulating charge using $\Delta q = \Delta\Phi / R$, which does not depend on the duration of the flux change. Self and mutual inductance questions ask for coupling coefficients $k = M / \sqrt{(L_1 L_2)}$ or energy stored inside an inductor when current ramps up linearly.

How to practise it

Start by mastering Faraday's law of induction and Lenz's law: induced emf is $e = - d\Phi/dt = - N\, d(B A \cos\theta)/dt$. Emf can be generated by varying magnetic field B, area A, or orientation angle θ. The total electric charge circulating through a circuit of resistance R when magnetic flux changes by ΔΦ is $q = |\Delta\Phi| / R$, which does not depend on the rate of flux change.

Next, study motional emf formulas thoroughly. For a straight conductor of length L moving with velocity v perpendicular to magnetic field B, the motional emf is $e = B v L$. For a rod rotating about one end with angular speed ω, the induced potential difference between ends is $e = (1/2) B \omega L^2$. For a metallic disc of radius R rotating about its central axis, the radial emf between center and rim is $e = (1/2) B \omega R^2$.

Finally, master inductor relations and transients. Self-induced back emf is $e = - L (dI/dt)$. Magnetic energy stored in an inductor carrying steady current I is $U = (1/2) L I^2$, with magnetic energy density per unit volume $u_B = B^2$ / (two μ_zero). In a series LR circuit connected to a DC source, current rises according to $I(t) = I_{zero} [1 - \exp(- t R / L)]$, where the inductive time constant is $\tau = L / R$. In an undamped LC circuit, electromagnetic energy oscillates between electric and magnetic forms with natural frequency $\omega_{zero} = 1 / \sqrt{(L C)}$.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

An inductor of inductance 5 henry is carrying an electric current of $4\ mA$. Then the energy stored in the inductor is

(A) $50\ \mu J$
(B) $1000\ \mu J$
(C) $40\ \mu J$
(D) $20\ \mu J$

Answer: (C) $40\ \mu J$ · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The ratio of the turns per unit length in two inductors is $2:1$. Then the ratio of the impedances produced by the inductors is

(A) 2
(B) 4
(C) $1/2$
(D) $1/4$

Answer: (B) 4 · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

A circular coil of radius 8 cm, 400 turns and resistance 2Ω is placed with its plane perpendicular to the horizontal component of the earth's magnetic field. It is rotated about its vertical diameter through 180^0 in 0.30 sec. Horizontal component of the earth's magnetic field at the place is 3×10^{-5} T. The magnitude of current induced in the coil is approximately

(A) 4×10^{-2} A
(B) 8×10^{-4} A
(C) 8×10^{-2} A
(D) 1.92×10^{-3} A

Answer: (B) 8×10^{-4} A · The council's preliminary key

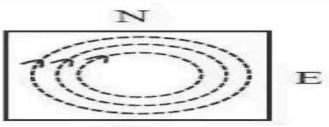
Q4 AP EAPCET 2026 · 15 May · Shift 1 MCQ

A metal sheet is placed in a magnetic field whose magnitude changes from zero to maximum. The direction of eddy currents produced in the plate is shown in the figure. Then the direction of magnetic field is

(see the figure above)

A metal sheet is placed in a magnetic field whose magnitude changes from zero to maximum. The direction of eddy currents produced in the plate is shown in the figure. Then the direction of magnetic field is

శూన్యము నుండి గరిష్ఠమునకు మారుచున్న పరిమాణం గల అయస్కాంత క్షేత్రంలో ఒక లోహపు పలకను ఉంచారు. పలకలో ఎడ్డీ ప్రవాహము పటములో చూపినట్లు ఉన్న అయస్కాంత క్షేత్ర దిశ



Options :

1. Normally inwards
   లంబంగా లోపలికి
2. Normally outwards
   లంబంగా బయటకి
3. From West to East
   పడమర నుండి తూర్పు వైపుకి
4. From North to South
   ఉత్తరం నుండి దక్షిణం వైపుకి

(A) Normally inwards
(B) Normally outwards
(C) From West to East
(D) From North to South

Answer: (B) Normally outwards · The council's preliminary key

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Q5 AP EAPCET 2026 · 15 May · Shift 2 MCQ

A current carrying loop is placed perpendicular to the direction of a uniform magnetic field of 40 mT. If the radius of the loop decreases at constant rate of $1.4\ \text{mm s}^{-1}$, the induced emf when the radius of the loop becomes 2.5 cm is

(A) $6.6\ \mu\text{V}$
(B) $2.2\ \mu\text{V}$
(C) $4.4\ \mu\text{V}$
(D) $8.8\ \mu\text{V}$

Answer: (D) $8.8\ \mu\text{V}$ · The council's preliminary key

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Q6 AP EAPCET 2026 · 14 May · Shift 1 MCQ

In a coil the current varies from -3A to $+3\text{A}$ in 4s, and induces an emf 0.2V. The self-inductance of the coil is

(A) 0.133 H
(B) 0.266 H
(C) 0.65 H
(D) 0.532 H

Answer: (A) 0.133 H · The council's preliminary key

Q7 AP EAPCET 2026 · 14 May · Shift 2 MCQ

A loop moves towards a stationary magnet at constant speed V resulting an induced emf E within the loop. If the magnet also moves away from the loop at the same speed V, the new induced emf in the loop is

(A) E
(B) $\frac{E}{2}$
(C) $2E$
(D) 0

Answer: (D) 0 · The council's preliminary key

Q8 AP EAPCET 2026 · 13 May · Shift 1 MCQ

A 2 m long solenoid with diameter 2 cm and 2000 turns has a secondary coil of 1000 turns wound closely near its midpoint. The mutual inductance between the two coils is

(A) 2.4×10^{-4} H
(B) 3.9×10^{-4} H
(C) 1.28×10^{-3} H
(D) 3.14×10^{-3} H

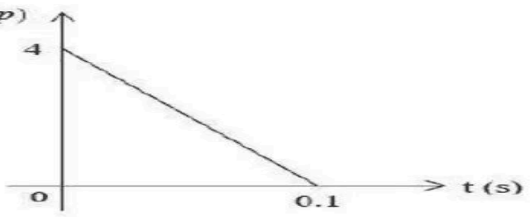
Answer: (B) 3.9×10^{-4} H · The council's preliminary key

Q9 AP EAPCET 2026 · 13 May · Shift 2 MCQ

In a coil of resistance $10\,\Omega$, the induced current developed by changing magnetic flux through it is shown in figure as a function of time. The magnitude of charge in flux through the coil in weber is

(see the figure above)

In a coil of resistance 10Ω, the induced current developed by changing magnetic flux through it is shown in figure as a function of time. The magnitude of charge in flux through the coil in weber is



10Ω నిరోధం గల ఒక తీగ చుట్ట ద్వారా వెళ్ళే అయస్కాంత అభివాహంలోని మార్పు వలన దానిలో ప్రేరితమయ్యే విద్యుత్ ప్రవాహం, కాలం యొక్క ప్రమేయంగా పటంలో ఇవ్వబడింది. అయితే, తీగ చుట్ట ద్వారా వెళ్ళే అయస్కాంత అభివాహంలోని మార్పు యొక్క పరిమాణం వెబర్ లలో

Options :

1. 8
2. 6
3. 4
4. 2

(A) 8
(B) 6
(C) 4
(D) 2

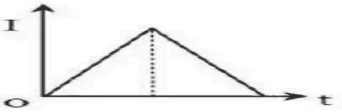
Answer: (D) 2 · The council's preliminary key

Q10 AP EAPCET 2026 · 12 May · Shift 1 MCQ

The current I in an induction coil is varying with time t as shown in the figure. Which one of the following graphs shows the variation of voltage in the coil with time?

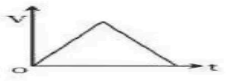
(see the figure above)

The current I in an induction coil is varying with time t as shown in the figure. Which one of the following graphs shows the variation of voltage in the coil with time?

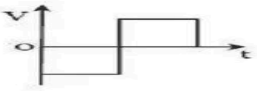


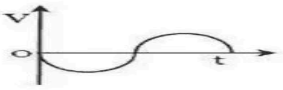
కాలం t తో ఒక ప్రేరక చుట్ట లో ప్రవహించే విద్యుత్ ప్రవాహాన్ని తెలిపే గ్రాఫ్ పటంలో చూపబడినది. క్రింది వాటిలో ఏది కాలంతో పాటు ప్రేరక చుట్ట వోల్టేజిలో వచ్చే మార్పును సూచిస్తుంది

Options :

1. 

2. 

3. 

4. 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (C) · The council's preliminary key

Q11 AP EAPCET 2026 · 12 May · Shift 2 MCQ

A pure inductor of inductance 3 H (negligible resistance) is connected to a time-varying voltage source such that v(t) = 4t volts. Here, t is in seconds. If the voltage is applied at $t = 0$, calculate the energy stored in the inductor after 3 s.

(A) 24 J
(B) 36 J
(C) 48 J
(D) 54 J

Answer: (D) 54 J · The council's preliminary key

Q12 TS EAPCET 2026 · 11 May · Shift 1 MCQ

The magnetic flux (ϕ in weber) linked with a coil varies with time (t in second) as per the equation $\phi = 2.5t^2 + 5t + 7$. If the induced electric power in the coil at a time 3 s is 2 W, then the induced electric power in the coil at a time 5 s is

(A) 5.5 W
(B) 3.5 W
(C) 2.5 W
(D) 4.5 W

Answer: (D) 4.5 W · The council's preliminary key

Q13 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If the current passing through a coil of self-inductance 50 mH having 50 turns is 5 A, then the magnetic flux linked with the coil (in 10^{-3} Wb) is

(A) 5
(B) 20
(C) 10
(D) 250

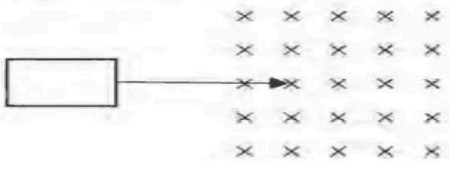
Options (4) or (1) were accepted. More than one answer was accepted. · The council's preliminary key

Q14 TS EAPCET 2026 · 10 May · Shift 1 MCQ

In the given figure, the directions of induced current in a square loop as it enters and leaves a uniform magnetic field respectively are

(see the figure above)

In the given figure, the directions of induced current in a square loop as it enters and leaves a uniform magnetic field respectively are
ఇవ్వబడిన పటంలో ఒక చతురస్రాకార లూప్, ఒక ఏకరీతి అయస్కాంత క్షేత్రం లోనికి ప్రవేశించునప్పుడు మరియు బయటకు వచ్చునప్పుడు ప్రేరిత విద్యుత్ ప్రవాహ దిశలు వరుసగా



Options :
1. Counter clockwise, Clockwise
అపసవ్య దిశ, సవ్య దిశ
2. Clockwise, Counter clockwise
సవ్య దిశ, అపసవ్య దిశ
3. Counter clockwise, Counter clockwise
అపసవ్య దిశ, అపసవ్య దిశ
4. Clockwise, Clockwise
సవ్య దిశ, సవ్య దిశ

(A) Counter clockwise, Clockwise
(B) Clockwise, Counter clockwise
(C) Counter clockwise, Counter clockwise
(D) Clockwise, Clockwise

Answer: (A) Counter clockwise, Clockwise · The council's preliminary key

Q15 TS EAPCET 2026 · 10 May · Shift 2 MCQ

If the energy stored in an inductor is 18 mJ when a current of 3 A is passed through it, then the magnetic flux linked with the inductor is

(A) 36 mWb
(B) 24 mWb
(C) 18 mWb
(D) 12 mWb

Answer: (D) 12 mWb · The council's preliminary key

Q16 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The magnetic energy stored per unit volume in a solenoid with 1000 turns per metre carrying a current of 0.7 A is

(A) $0.154\ \mathrm{J\,m^{-3}}$
(B) $0.616\ \mathrm{J\,m^{-3}}$
(C) $0.308\ \mathrm{J\,m^{-3}}$
(D) $0.924\ \mathrm{J\,m^{-3}}$

Answer: (C) $0.308\ \mathrm{J\,m^{-3}}$ · The council's preliminary key

Q17 TS EAPCET 2026 · 9 May · Shift 1 MCQ

An LC circuit with negligible resistance containing a 20 mH inductor and a 50 μF capacitor with an initial charge of 10 mC is closed at t = 0. Then the minimum time taken (in μs) for the total energy to be shared equally between the inductor and capacitor is

(A) 375π
(B) 125π
(C) 500π
(D) 250π

Answer: (D) 250π · The council's preliminary key

Q18 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If a conducting rod of length 100 cm rotates about one of its ends with a constant frequency of 14 revolutions per second in a plane perpendicular to a uniform magnetic field of 2 T, then the induced

emf between the two ends of the rod is

(A) 144 V
(B) 88 V
(C) 122 V
(D) 230 V

Answer: (B) 88 V · The council's preliminary key

Q19 AP EAPCET 2025 · 27 May · Shift 1 MCQ

A coil having 100 square loops each of side 10 cm is placed such that its plane is normal to a magnetic field, which is changing at a rate of $0.7\ \mathrm{T\,s^{-1}}$. The emf induced in the coil is

(A) 0.2 V
(B) 0.4 V
(C) 0.7 V
(D) 1 V

Answer: (C) 0.7 V · The council's preliminary key

Q20 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The self inductance of an air-cored solenoid of length 40 cm, diameter 7 cm having 200 turns is nearly

(A) $484\ \mu\mathrm{H}$
(B) $242\ \mu\mathrm{H}$
(C) $121\ \mu\mathrm{H}$
(D) $968\ \mu\mathrm{H}$

Answer: (A) $484\ \mu\mathrm{H}$ · The council's preliminary key

Q21 AP EAPCET 2025 · 26 May · Shift 2 MCQ

When current in a coil changes from 2 A to 5 A in a time of 0.3 s, if the emf induced in the coil is 40 mV, then the self inductance of the coil is

(A) 4 H
(B) 4 mH
(C) 40 mH
(D) 4 μH

Answer: (B) 4 mH · The council's preliminary key

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Q22 AP EAPCET 2025 · 24 May · Shift 1 MCQ

A coil of resistance $200\,\Omega$ is placed in a magnetic field. If the magnetic flux ϕ (in weber) linked with the coil varies with time 't' (in second) as per the equation $\phi = 50t^2 + 4$, then the current induced in the coil at a time t = 2 s is

(A) 2 A
(B) 1 A
(C) 0.5 A
(D) 0.1 A

Answer: (B) 1 A · The council's preliminary key

Q23 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If a wheel with 24 metallic spokes each 40 cm long is rotated with a speed of 180 rev/min in a plane normal to the horizontal component of earth's magnetic field, the emf induced between the axle and the rim of the wheel is E. If the number of spokes is made 12 and the wheel is rotated with a speed of 90 rev/min in the same field, the induced emf is

(A) E
(B) 2E
(C) 4E
(D) 0.5E

Answer: (D) 0.5E · The council's preliminary key

Q24 AP EAPCET 2025 · 23 May · Shift 2 MCQ

When a current of 4 mA passes through an inductor, if the flux linked with it is $32 \times 10^{-6}\ \mathrm{T\,m^2}$, then the energy stored in the inductor is

(A) $64 \times 10^{-9}\ \mathrm{J}$
(B) $32 \times 10^{-9}\ \mathrm{J}$
(C) $128 \times 10^{-9}\ \mathrm{J}$
(D) $96 \times 10^{-9}\ \mathrm{J}$

Answer: (A) $64 \times 10^{-9}\ \mathrm{J}$ · The council's preliminary key

Q25 AP EAPCET 2025 · 22 May · Shift 1 MCQ

A coil of 45 turns and radius 4 cm is placed in a uniform magnetic field such that its plane is perpendicular to the direction of the field. If the magnetic field increases from 0 to 0.70 T at a constant rate in a time interval of 220 s, then the induced emf in the coil is

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(A) 0.32 mV
(B) 0.50 mV
(C) 0.72 mV
(D) 0.96 mV

Answer: (C) 0.72 mV · The council's preliminary key

Q26 AP EAPCET 2025 · 22 May · Shift 2 MCQ

A metallic disc of radius 0.3 m is rotating with a constant angular speed of 60 rad s^{-1} in a plane perpendicular to a uniform magnetic field of 5×10^{-2} T. The emf induced between a point on the rim and centre of the disc is

(A) 0.06 V
(B) 0.612 V
(C) 1.35 V
(D) 0.135 V

Answer: (D) 0.135 V · The council's preliminary key

Q27 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If the magnetic field inside a solenoid is B, then the magnetic energy stored in it per unit volume is (c - speed of light in vacuum and ε_0 is permittivity of free space)

(A) $\varepsilon_0 c^2 B^2$
(B) $\frac{\varepsilon_0 c^2 B^2}{2}$
(C) $2\varepsilon_0 c^2 B^2$
(D) $\frac{\varepsilon_0 c^2 B^2}{4}$

Answer: (B) $\frac{\varepsilon_0 c^2 B^2}{2}$ · The council's preliminary key

Q28 AP EAPCET 2025 · 21 May · Shift 1 MCQ

The resonant frequency of an LC circuit is f_0. If a dielectric slab of constant 16 is inserted completely between the plates of the capacitor, then the resonant frequency is

(A) $\frac{f_0}{2}$
(B) $2f_0$
(C) $\frac{f_0}{4}$
(D) $4f_0$

Answer: (C) $\frac{f_0}{4}$ · The council's preliminary key

Q29 AP EAPCET 2025 · 21 May · Shift 2 MCQ

A horizontal telegraph wire of length 30 m spread east to west fell down freely from a height of 20 m. If the resistance of the wire is $40\,\Omega$ and the horizontal component of the earth's magnetic field at the

place is 2×10^{-5} T, then the induced current when the wire reaches the ground is (Acceleration due to gravity = $10\ \mathrm{m\,s^{-2}}$)

(A) 0.3 mA
(B) 3 mA
(C) 3 A
(D) 0.03 A

Answer: (A) 0.3 mA · The council's preliminary key

Q30 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The radius of a coil of N turns is R. If the plane of the coil is placed parallel to a uniform magnetic field B, then the flux linked with the coil is

(A) πBNR^2
(B) $2\pi BNR^2$
(C) $\frac{\pi BNR^2}{2}$
(D) Zero

Answer: (D) Zero · The council's preliminary key

Q31 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A coil of resistance $16\ \Omega$ is placed with its plane perpendicular to a uniform magnetic field whose flux (ϕ in 10^{-3} weber) changes with time (t in second) as $\phi = 5t^2 + 4t + 2$. The induced current at time $t = 6$ seconds is

(A) 4 mA
(B) 2.12 mA
(C) 34 mA
(D) 74 mA

Answer: (A) 4 mA · The council's preliminary key

Q32 TS EAPCET 2025 · 4 May · Shift 2 MCQ

The small energy losses in transformers due to eddy currents can be reduced by

(A) winding the primary and secondary coils one over the other
(B) using thick wire
(C) using a laminated core
(D) using magnetic material with low hysteresis loss

Answer: (C) using a laminated core · The council's preliminary key

EdLoop EAPCET

Q33 TS EAPCET 2025 · 3 May · Shift 1 MCQ

A circular coil of area $3 \times 10^{-2}\ \mathrm{m}^2$, 900 turns and a resistance of $1.8\ \Omega$ is placed with its plane perpendicular to a uniform magnetic field of $3.5 \times 10^{-5}\ \mathrm{T}$. The current induced in the coil when it is rotated through 180° in half a second is

(A) $2.1\ \mathrm{mA}$
(B) $1.8\ \mathrm{mA}$
(C) $1.5\ \mathrm{mA}$
(D) $2.7\ \mathrm{mA}$

Answer: (A) $2.1\ \mathrm{mA}$ · The council's preliminary key

Q34 TS EAPCET 2025 · 3 May · Shift 2 MCQ

An emf of 2.8 mV is induced in a rectangular loop of area $150\ \mathrm{cm}^2$ when the current in the loop changes from 3 A to 8 A in a time of 0.2 s. Then the self-inductance of the loop is

(A) $112\ \mu\mathrm{H}$
(B) $56\ \mu\mathrm{H}$
(C) $28\ \mu\mathrm{H}$
(D) $84\ \mu\mathrm{H}$

Answer: (A) $112\ \mu\mathrm{H}$ · The council's preliminary key

Q35 TS EAPCET 2025 · 2 May · Shift 1 MCQ

The plane of a circular coil of resistance $7.5\ \Omega$ is placed perpendicular to a uniform magnetic field. The flux ϕ (in weber) through the coil varies with time t (in second) as $\phi = 2t^2 + 3t - 2$. The induced power in the coil at time $t = 3\,\mathrm{s}$ is

(A) 7.5 W
(B) 15 W
(C) 30 W
(D) 20 W

Answer: (C) 30 W · The council's preliminary key

Q36 TS EAPCET 2025 · 2 May · Shift 2 MCQ

A coil of resistance $8\ \Omega$, number of turns 250 and area $120\ \mathrm{cm}^2$ is placed in a uniform magnetic field of 2 T such that the plane of the coil makes an angle of $\frac{\pi}{6}$ with the direction of the magnetic field. In a time of 100 ms, the coil is rotated until its plane becomes parallel to the direction of the magnetic field. The current induced in the coil is

(A) 5.25 A
(B) 3.75 A
(C) 2.75 A
(D) 1.25 A

Answer: (B) 3.75 A · The council's preliminary key

Q37 AP EAPCET 2024 · 23 May · Shift 1 MCQ

In a circuit the current falls from 14 A to 4 A in a time 0.2 ms. If the induced emf is 150 V, then the self inductance of the circuit is

(A) 6 H
(B) 6 mH
(C) 3 mH
(D) 3 H

Answer: (C) 3 mH · The council's preliminary key

Q38 AP EAPCET 2024 · 22 May · Shift 1 MCQ

A coil of inductance L is divided into 6 equal parts. All these parts are connected in parallel. The resultant inductance of this combination is

(A) $\frac{L}{6}$
(B) $\frac{L}{36}$
(C) $\frac{L}{24}$
(D) $6L$

Answer: (B) $\frac{L}{36}$ · The council's preliminary key

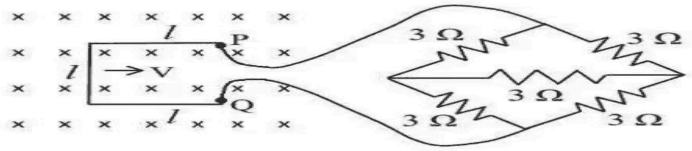
Q39 AP EAPCET 2024 · 22 May · Shift 2 MCQ

A metallic wire loop of side (l) 0.1 m and resistance of 1Ω is moved with a constant velocity in a uniform magnetic field of $2\ \mathrm{Wm}^{-2}$ as shown in the figure. The magnetic field is perpendicular to the plane of the loop. The loop is connected to a network of resistors. The velocity of loop so as to have a steady current of $1\ mA$ in loop is

(see the figure above)

A metallic wire loop of side (l) 0.1 m and resistance of 1Ω is moved with a constant velocity in a uniform magnetic field of 2 Wm^{-2} as shown in the figure. The magnetic field is perpendicular to the plane of the loop. The loop is connected to a network of resistors. The velocity of loop so as to have a steady current of 1 mA in loop is

భుజం (l) 0.1 m మరియు నిరోధం 1Ω గల తీగచుట్ట 2 Wm^{-2} తీవ్రత గల ఏకరీతి అయస్కాంత క్షేత్రంలో పటంలో చూపినట్లు స్థిర వేగంతో చలిస్తోంది. అయస్కాంత క్షేత్రం తీగచుట్ట తలానికి లంబంగా వుంది. తీగచుట్ట నిరోధాల వలయానికి కలపబడింది. తీగచుట్టలో 1 mA విద్యుత్ నిలకడగా ప్రవహించాలంటే తీగచుట్ట వేగం



Options :

1. $0.67\ cm\ s^{-1}$
2. $2\ cm\ s^{-1}$
3. $3\ cm\ s^{-1}$
4. $4\ cm\ s^{-1}$

(A) $0.67\ \text{cm s}^{-1}$

(B) $2\ \text{cm s}^{-1}$

(C) $3\ \text{cm s}^{-1}$

(D) $4\ \text{cm s}^{-1}$

Answer: (B) $2\ \text{cm s}^{-1}$ · The council's preliminary key

Q40 AP EAPCET 2024 · 21 May · Shift 1 MCQ

X and Y are two circuits having coefficient of mutual inductance $3\ \text{mH}$ and resistances $10\ \Omega$ and $4\ \Omega$ respectively. To have induced current $60 \times 10^{-4}\ \text{A}$ in circuit Y, the amount of current to be changed in circuit X in 0.02 sec is

(A) $1.6\ \text{A}$

(B) $0.16\ \text{A}$

(C) $0.32\ \text{A}$

(D) $3.2\ \text{A}$

Answer: (B) $0.16\ \text{A}$ · The council's preliminary key

Q41 AP EAPCET 2024 · 21 May · Shift 1 MCQ

Two figures are shown as Fig. A and Fig. B. The time constant of Fig. A is τ_A and time constant of Fig. B is τ_B. Then

(see the figure above)

Two figures are shown as Fig. A and Fig. B. The time constant of Fig. A is τ_A and time constant of Fig. B is τ_B. Then
రెండు పటాలు, పటం A మరియు పటం B గా చూపబడినవి. పటం A యొక్క కాలస్థిరాంకం τ_A మరియు పటం B యొక్క కాలస్థిరాంకం τ_B అయినచో

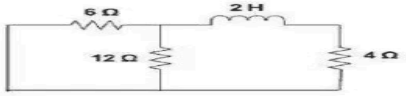


Fig. A (పటం A)

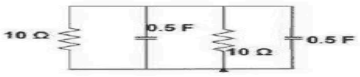


Fig. B (పటం B)

Options :

1. $\tau_A = \frac{1}{4}$s and $\tau_B = 5$s
   $\tau_A = \frac{1}{4}$s మరియు $\tau_B = 5$s
2. $\tau_A = \frac{1}{2}$s and $\tau_B = \frac{1}{5}$s
   $\tau_A = \frac{1}{2}$s మరియు $\tau_B = \frac{1}{5}$s
3. $\tau_A = 4$s and $\tau_B = 5$s
   $\tau_A = 4$s మరియు $\tau_B = 5$s
4. $\tau_A = \frac{1}{3}$s and $\tau_B = 10$s
   $\tau_A = \frac{1}{3}$s మరియు $\tau_B = 10$s

(A) $\tau_A = \frac{1}{4}$s and $\tau_B = 5$s
(B) $\tau_A = \frac{1}{2}$s and $\tau_B = \frac{1}{5}$s
(C) $\tau_A = 4$s and $\tau_B = 5$s
(D) $\tau_A = \frac{1}{3}$s and $\tau_B = 10$s

Answer: (A) $\tau_A = \frac{1}{4}$s and $\tau_B = 5$s · The council's preliminary key

Q42 AP EAPCET 2024 · 21 May · Shift 2 MCQ

The current passing through a coil of 120 turns and inductance 40 mH is 30 mA. The magnetic flux linked with the coil is

(A) 20×10^{-6} Wb
(B) 5×10^{-6} Wb
(C) 12×10^{-6} Wb
(D) 10×10^{-6} Wb

Answer: (D) 10×10^{-6} Wb · The council's preliminary key

Q43 AP EAPCET 2024 · 20 May · Shift 1 MCQ

When two coaxial coils having same current in same direction are brought to each other, then the value of current in both the coils

(A) Increases
(B) Decreases
(C) Remains same
(D) Increases in one coil and decreases in other coil

Answer: (B) Decreases · The council's preliminary key

Q44 AP EAPCET 2024 · 20 May · Shift 2 MCQ

The ratio of the number of turns per unit length of two solenoids A and B is 1:3 and the lengths of A and B are in the ratio 1:2. If the two solenoids have same cross sectional area, the ratio of the self inductances of the solenoids A and B is

(A) 1:12
(B) 1:6
(C) 1:18
(D) 1:9

Answer: (C) 1:18 · The council's preliminary key

Q45 AP EAPCET 2024 · 19 May · Shift 2 MCQ

Magnetic field at a distance of r from z axis is $B = B_0 r t \hat{k}$ present in the region. 'B_0' is constant and 't' is time. The magnitude of induced electric field at a distance of r from z-axis is.

(A) $\frac{B_0 r^3}{3}$
(B) $\frac{2\pi B_0 r}{3}$
(C) $\frac{B_0 r^2}{2\pi}$
(D) $\frac{B_0 r^2}{3}$

Answer: (D) $\frac{B_0 r^2}{3}$ · The council's preliminary key

Q46 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If the current through an inductor increases from 2 A to 3 A, the magnetic energy stored in the inductor increases by

(A) 125%
(B) 225%
(C) 50%
(D) 75%

Answer: (A) 125% · The council's preliminary key

Q47 TS EAPCET 2024 · 11 May · Shift 1 MCQ

The energy stored in a coil of inductance 80 mH carrying a current of 2.5 A is

(A) 1.25 J
(B) 0.75 J
(C) 0.25 J
(D) 0.50 J

Answer: (C) 0.25 J · The council's preliminary key

Q48 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The mutual inductance of two coils is 8 mH. The current in one coil changes according to the equation $I = 12 \sin 100\, t$, where 'I' is in ampere and 't' is time in second. The maximum value of emf induced in the second coil is

(A) 9.6 V
(B) 4.8 V
(C) 3.2 V
(D) 12.8 V

Answer: (A) 9.6 V · The council's preliminary key

Q49 TS EAPCET 2024 · 9 May · Shift 1 MCQ

Two circular coils of radii r_1 and r_2 ($r_1 \ll r_2$) are placed coaxially with their centers coinciding. The mutual inductance of the arrangement is

(A) $\dfrac{\mu_0 \pi r_2^2}{2r_1}$
(B) $\dfrac{\mu_0 \pi r_1 r_2}{2(r_1 + r_2)}$
(C) $\dfrac{\mu_0 \pi r_1^2}{2r_2}$
(D) $\dfrac{\mu_0 \pi (r_1 + r_2)}{2 r_1 r_2}$

Answer: (C) $\dfrac{\mu_0 \pi r_1^2}{2r_2}$ · The council's preliminary key

Q50 TS EAPCET 2024 · 9 May · Shift 2 MCQ

A train with an axle of length 1.66 m is moving towards north with a speed of $90\ \mathrm{kmh}^{-1}$. If the vertical component of the earth's magnetic field is 0.2×10^{-4} T, the emf induced across the ends of the axle of the train is

(A) 16.6 mV
(B) 1.66 mV
(C) 0.83 mV
(D) 8.3 mV

Answer: (C) 0.83 mV · The council's preliminary key

EdLoop EAPCET

Q51 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The natural frequency of an LC circuit is 120 kHz. When the capacitor in the circuit is totally filled with a dielectric material, the natural frequency of the circuit decreases by 20 kHz. Dielectric constant of the material is

(A) 3.33
(B) 1.44
(C) 2.12
(D) 1.91

Answer: (B) 1.44 · The council's preliminary key

Q52 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The shiny metal disk in the electric power meter (analog type) rotates due to

(A) temperature change
(B) eddy currents
(C) an external motor
(D) pressure change

Answer: (B) eddy currents · The council's preliminary key

Q53 AP EAPCET 2023 · 18 May · Shift 1 MCQ

If B is magnetic field and q is the charge then the following represents the Gauss's law of magnetism

(A) $\int \vec{B} \cdot d\vec{s} = 0$
(B) $\int \vec{B} \cdot d\vec{s} = q$
(C) $\int \vec{B} \cdot d\vec{s} = 4\pi$
(D) $\int \vec{B} \cdot d\vec{s} = \mu_o q$

Answer: (A) $\int \vec{B} \cdot d\vec{s} = 0$ · The council's preliminary key

Q54 AP EAPCET 2023 · 18 May · Shift 1 MCQ

A circular coil of radius 10 cm and resistance of $2\ \Omega$ is placed with its plane perpendicular to the horizontal component of the earth's magnetic field. It is rotated about its vertical diameter through 180° in 0.25 s. If the magnitude of the induced emf is 3.8×10^{-3} V, then the number of turns of the coil is

(Horizontal component of earth's magnetic field at the place is 3×10^{-5} T)

(A) 504 turns
(B) 458 turns
(C) 302 turns
(D) 608 turns

Answer: (A) 504 turns · The council's preliminary key

Q55 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The self-inductance of a long solenoid of cross-sectional area A, length l and n turns per unit length is given by

(A) $\mu_o n A l$
(B) $\mu_o n^2 A l$
(C) $\mu_o n^2 A^2 l$
(D) $\mu_o n^2 \pi A^2 l$

Answer: (B) $\mu_o n^2 A l$ · The council's preliminary key

Q56 AP EAPCET 2023 · 17 May · Shift 1 MCQ

Physically, the self-inductance plays the role of

(A) inertia
(B) kinetic energy
(C) potential energy
(D) velocity

Answer: (A) inertia · The council's preliminary key

Q57 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The total emf induced in a closely wound coil of N turns in which the magnetic flux linked with the coil changing at the rate $\frac{d\phi_B}{dt}$ is

(A) $-N\frac{d\phi_B}{dt}$
(B) $N\frac{d\phi_B}{dt}$
(C) $-N\frac{d^2\phi_B}{dt^2}$
(D) $-\frac{d\phi_B}{dt}$

Answer: (A) $-N\frac{d\phi_B}{dt}$ · The council's preliminary key

Q58 AP EAPCET 2023 · 16 May · Shift 1 MCQ

When the current through an inductor is changed at from $2\ \mathrm{A}$ to $6\ \mathrm{A}$ in time $2\ \mathrm{s}$, emf induced in it is $3\ \mathrm{V}$. Then the inductance of the inductor is

(A) $1.4\ \mathrm{H}$
(B) $0.8\ \mathrm{H}$
(C) $1.5\ \mathrm{H}$
(D) $0.6\ \mathrm{H}$

Answer: (C) $1.5\ \mathrm{H}$ · The council's preliminary key

Q59 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The Lenz law is associated with

(A) law of conservation of charge.
(B) law of conservation of mass.
(C) law of conservation of angular momentum.
(D) law of conservation of energy.

Answer: (D) law of conservation of energy. · The council's preliminary key

Q60 TS EAMCET 2023 · 14 May · Shift 1 MCQ

Metal detector works on the principle of

(A) Ohm's law
(B) Coulomb's law
(C) Electromagnetic induction
(D) Stefan's law of radiation

Answer: (C) Electromagnetic induction · The council's preliminary key

Q61 TS EAMCET 2023 · 14 May · Shift 1 MCQ

A copper disc of radius 0.1 m rotates about an axis passing through its centre and perpendicular to its plane with 10 revolutions per second in a uniform transverse magnetic field of 0.1 T. The emf induced across the radius of the disc is

(A) $\frac{\pi}{10}\ \mathrm{V}$
(B) $\frac{2\pi}{10}\ \mathrm{V}$
(C) $10\pi\ \mathrm{mV}$
(D) $20\pi\ \mathrm{mV}$

Answer: (C) $10\pi\ \mathrm{mV}$ · The council's preliminary key

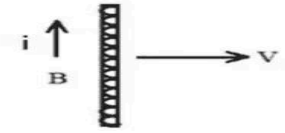
Q62 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A conducting rod is moving towards right with a velocity 'V' in a uniform magnetic field 'B'.

If the direction of induced current 'i' is as shown in the figure, then the direction of 'B' is

(see the figure above)

A conducting rod is moving towards right with a velocity 'V' in a uniform magnetic field 'B'. If the direction of induced current 'i' is as shown in the figure, then the direction of 'B' is
ఒక వాహక కడ్డీ ఒక ఏకరీతి అయస్కాంత క్షేతం 'B' లో V వేగంతో కుడివైపు కదులుచున్నది. దాని యందు ప్రేరితమైన విద్యుత్ ప్రవాహం 'i' దిశ పటములో చూపిన విధంగా ఉన్నప్పుడు అయస్కాంత క్షేత దిశ



Options :

1. in the plane of the paper towards right
పేపరు తలములో కుడివైపుకు ఉండును

2. in the plane of the paper towards left
పేపరు తలములో ఎడమవైపుకు ఉండును

3. perpendicular to the plane of the paper and into the paper
పేపరు తలానికి లంబంగా మరియు పేపరు లోనికి ఉండును

4. perpendicular to the plane of the paper and out of the paper
పేపరు తలానికి లంబంగా మరియు పేపరు బయటకు ఉండును

(A) in the plane of the paper towards right
(B) in the plane of the paper towards left
(C) perpendicular to the plane of the paper and into the paper
(D) perpendicular to the plane of the paper and out of the paper

Answer: (C) perpendicular to the plane of the paper and into the paper · The council's preliminary key

Q63 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The expression for the magnetic energy stored in a solenoid of length L, in terms of magnetic field B and area A is

(A) $\frac{1}{2\mu_0}B^2AL$
(B) $\frac{1}{2\epsilon_0}B^2AL$
(C) $\frac{1}{2\mu_0}BA^2L$
(D) $\frac{1}{2\epsilon_0}BA^2L$

Answer: (A) $\frac{1}{2\mu_0}B^2AL$ · The council's preliminary key

Q64 TS EAMCET 2023 · 13 May · Shift 1 MCQ

An aeroplane is travelling horizontally towards west with a speed of $540\ \mathrm{kmh}^{-1}$. The wing span of the plane is 20 m. If the horizontal component of the earth's magnetic field at the location is $2.5\sqrt{3} \times 10^{-4}\ \mathrm{T}$ and the dip angle is 30°, the potential difference developed between the ends of the wing is

(A) 1 V
(B) 1.5 V
(C) 0.75 V
(D) 0.5 V

Answer: (C) 0.75 V · The council's preliminary key

Q65 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The self-inductance of a coil depends on

(A) number of turns of the coil only
(B) size of the coil only
(C) shape of the coil only
(D) size, shape of the coil and number of turns in it

Answer: (D) size, shape of the coil and number of turns in it · The council's preliminary key

Q66 TS EAMCET 2023 · 13 May · Shift 2 MCQ

A conducting circular coil is placed in a uniform magnetic field with the magnetic field initially directed perpendicular to the plane of the coil. In step A, the coil is rotated from its initial position by 60° about its diameters in time 't'. In step B, the coil is further rotated about the same axis in the same sense by another 120° in time '2t'. Ratio of emf induced in the coil in step A to that in step B is

(A) $1:1$
(B) $1:2$
(C) $1:3$
(D) $2:3$

Answer: (D) $2:3$ · The council's preliminary key

Q67 TS EAMCET 2023 · 12 May · Shift 1 MCQ

When a current 'i' through a solenoid is increasing at a constant rate then the induced current is

(A) Constant and it will be in the direction of 'i'
(B) Constant and it will be in a direction opposite to the 'i'
(C) Increases with time and it will be in the direction of 'i'
(D) Increases with time and opposite to the direction of 'i'

Answer: (B) Constant and it will be in a direction opposite to the 'i' · The council's preliminary key

Q68 TS EAMCET 2023 · 12 May · Shift 1 MCQ

In a pair of adjacent coils if the current in one coil changes from 10 A to 2 A in a time 0.2 s, an emf of 120 V is induced in another coil. The mutual inductance of the pair of the coils is

(A) 2 H
(B) 3 H
(C) 6 H
(D) 9 H

Answer: (B) 3 H · The council's preliminary key

Q69 TS EAMCET 2023 · 12 May · Shift 2 MCQ

If the vertical component of earth's magnetic field is 0.5×10^{-4} T at a point. When an aeroplane of wing span 4 m is moving horizontally at this place at 360 kmh^{-1}, then the motional emf formed across the ends of the wings is

(A) 20×10^{-4} V
(B) 20×10^{-2} V
(C) 20×10^{-3} V
(D) 2×10^{-4} V

Answer: (C) 20×10^{-3} V · The council's preliminary key

Q70 TS EAMCET 2023 · 12 May · Shift 2 MCQ

A boy is playing with the empty rim of a cycle wheel of radius 40 cm by rolling it along a horizontal road towards north with angular speed of 20 rad s^{-1}. Considering the effect of magnetic field of earth, the e.m.f induced in the rim is
(Horizontal component of earth's magnetic field = 0.26 G)

(A) Zero
(B) 2 μV
(C) 2.4 mV
(D) 3 V

Answer: (A) Zero · The council's preliminary key

Q71 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

A metal disc of radius 30 cm rotates with a constant angular velocity $\omega = 100$ rad/s about its axis. Find the magnitude of potential difference between the centre and the rim of the disc of the external uniform magnetic field of induction B = 4 mT is directed perpendicular to the disc.

(A) 15 m V
(B) 18 m V
(C) 22 m V
(D) 20 m V

Answer: (B) 18 m V · The council's preliminary key

Q72 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

A wheel of 20 metallic spokes each 40 cm long is rotated with a speed of 180 rev/min in a plane normal to the horizontal component of earth's magnetic field H_e at a place. If $H_e = 0.4$ G (Gauss) at that place, the induced emf between the axle and the rim of the wheel is

(A) $192\pi \times 10^{-7}$ V
(B) $256\pi \times 10^{-7}$ V
(C) $148\pi \times 10^{-7}$ V
(D) $110\pi \times 10^{-7}$ V

Answer: (A) $192\pi \times 10^{-7}$ V · The council's preliminary key

Q73 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A wire loop of area $0.2\mathrm{m}^2$ has a resistance of $20\ \Omega$. A magnetic field pointing normal to the loop has a magnitude of 0.25 T and is reduced to zero at a uniform rate in 10^{-4} sec. What is induced emf and resulting current?

(A) 50 V, 2.5 A
(B) 500 V, 25 A
(C) 250 V, 12.5 A
(D) 500 V, 2.5 A

Answer: (B) 500 V, 25 A · The council's preliminary key

Q74 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

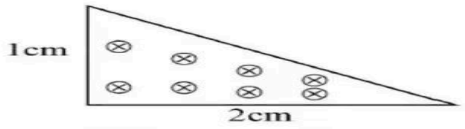
The magnetic flux through the triangular loop shown in the figure below
(see the figure above)
where a uniform magnetic field of strength 2T points perpendicularly into the plane of the triangle.

EdLoop EAPCET

Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

The magnetic flux through the triangular loop shown in the figure below

క్రింది పటంలో చూపిన త్రిభుజాకార ఉచ్చు అయస్కాంత అభివాహము



where a uniform magnetic field of strength 2T points perpendicularly into the plane of the triangle.

ఇచ్చట 2T బలం వున్న ఏకరీతి అయస్కాంత క్షేత్రంలో లంబంగా త్రిభుజం తలంలోకి వున్నది.

Options :

1. 10^{-4} Wb
2. 2×10^{-4} Wb
3. 1 Wb
4. 2 Wb

(A) 10^{-4} Wb
(B) 2×10^{-4} Wb
(C) 1 Wb
(D) 2 Wb

Answer: (B) 2×10^{-4} **Wb** · Checked by our team

Q75 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

A long solenoid has 20 turns per cm. A small loop of area $\frac{4}{\pi}$ cm^2 is placed inside the solenoid normal to its axis. If the current carried by the solenoid changes steadily from 1.0 A to 3.0A in 0.2 s, what is the magnitude of the induced emf in the loop while the current is changing?

(A) $2.4\ \mu\mathrm{V}$
(B) $3.2\ \mu\mathrm{V}$
(C) $7.2\ \mu\mathrm{V}$
(D) $4.8\ \mu\mathrm{V}$

Answer: (B) $3.2\ \mu\mathrm{V}$ · The council's preliminary key

Q76 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A flat circular coil has 100 turns of wire of radius 10 cm. A uniform magnetic field exists in a direction perpendicular to the plane of the coil and it grows at a rate of 0.1 T/sec. the induced emf in the coil is:

(A) π V
(B) 10π V
(C) $\frac{\pi}{10}$ V
(D) 2π V

Answer: (C) $\frac{\pi}{10}$ V · The council's preliminary key

Q77 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A 2μF capacitor is charged to 50 V by a battery. The battery is removed after capacitor is fully charged. At time $t = 0$, a 10 mH coil is connected in series with the capacitor. The maximum rate at which the current changes in the circuit is

(A) 2000 A/s
(B) 5000 A/s
(C) 2500 A/s
(D) 10000 A/s

Answer: (B) 5000 A/s · The council's preliminary key

Q78 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

A pair of adjacent coils having a mutual inductance, M. The current in one coil changes from 0 to 16 A in 0.3 s and the change of flux linkage with the other coil is 40 Wb. The value of M is

(A) $0.4\ \mathrm{H}$
(B) $0.12\ \mathrm{H}$
(C) $2.5\ \mathrm{H}$
(D) $8.3\ \mathrm{H}$

Answer: (C) $2.5\ \mathrm{H}$ · The council's preliminary key

Q79 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

A long solenoid having 100 turns per cm carries a current of $\frac{4}{\pi}$ A. At the centre of it is placed a coil of 200 turns of cross sectional area $25\ \mathrm{cm}^2$ having its axis parallel to the field produced by the solenoid. When the direction of the current in the solenoid is reversed with in 0.04 s, the induced emf in the coil is

(A) 0.2 V
(B) 0.4 V
(C) 0.002 V
(D) 0.016 V

Answer: (B) 0.4 V · The council's preliminary key

Q80 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

A solenoid has the length 1 m and the area of cross section $0.02\ \mathrm{m}^2$. If no. of turns in the solenoid is 5000 then the self inductance of the solenoid is

(A) 0.2π henry
(B) 0.4π henry
(C) 0.02π henry
(D) 0.04π henry

Answer: (A) 0.2π **henry** · The council's preliminary key

Q81 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Assertion (A) : When a circular coil, placed in a region with its plane parallel to a magnetic field, expands radially outwards, no emf is induced in it.
Reason (R) : There is a constant magnet (sic) field in the perpendicular (to the plane of the coil) direction.

(A) Both (A) and (R) are true. (R) is correct explanation of (A).
(B) Both (A) and (R) are true. (R) is not correct explanation of (A).
(C) (A) is true, (R) is false
(D) (A) is false, (R) is true

Answer: (C) (A) is true, (R) is false · The council's preliminary key

Q82 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

A uniform magnetic field $\vec{B}$ is perpendicular to the plane of a circular loop of diameter 10 cm formed from wire of diameter 2 mm and resistivity $2 \times 10^{-8}\ \Omega\mathrm{m}$. If a current of 11 A is to be induced in the loop then the rate at which $\vec{B}$ is to be changed is

(A) $2.8\ \mathrm{Ts}^{-1}$
(B) $1.4\ \mathrm{Ts}^{-1}$
(C) $3.2\ \mathrm{Ts}^{-1}$
(D) $2.4\ \mathrm{Ts}^{-1}$

Answer: (A) $2.8\ \mathrm{Ts}^{-1}$ · The council's preliminary key

Q83 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

A long solenoid is carrying a current $I = I_o \sin(\omega t)$, having N turns per unit length and radius R. A square loop is placed inside the solenoid with its plane perpendicular to the solenoid axis, and its corners touching the solenoid. Now the e m f induced in the square coil

(A) $\mu_o N I_o R^2 \sin(\omega t)$
(B) $2\mu_o N I_o R^2 \sin(\omega t)$
(C) $2\mu_o N I_o R^2 \omega \cos(\omega t)$
(D) $\mu_o N I_o R^2 \pi\omega \cos(\omega t)$

Answer: (C) $2\mu_o N I_o R^2 \omega \cos(\omega t)$ · The council's preliminary key

Q84 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

A circular loop of wire of radius 14 cm is placed in a magnetic field directed perpendicular to the plane of the loop. If the field decreases at a steady rate of $0.05\ \mathrm{Ts}^{-1}$ in some interval, then the magnitude of the emf induced in the loop is

(A) 2.08 mV
(B) 3.08 mV
(C) 2.16 mV
(D) 3.24 mV

Answer: (B) 3.08 mV · The council's preliminary key

Q85 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

A metal loop of area $10\ \mathrm{cm}^2$ is placed in a region such that its area vector points along $\hat{k}$. The region contains a uniform magnetic field of magnitude 1.73 T that points in the direction $\hat{i}+\hat{j}+\hat{k}$. When the magnetic field is switched off, the field decreases to zero at a steady rate in 10 s, then the magnitude of emf induced in the loop is

(A) $0.10\ \mathrm{mV}$
(B) $0.17\ \mathrm{mV}$
(C) $1\ \mathrm{mV}$
(D) $1.7\ \mathrm{mV}$

Answer: (A) $0.10\ \mathrm{mV}$ · The council's preliminary key

Q86 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A circular coil has 100 turns, radius 3 cm and resistance $4\ \Omega$. This coil is co-axial with a solenoid of 200 turns/cm and diameter 4 cm. If the solenoid current is decreased from 2 A to zero in 0.04 s, then the current induced in the coil is

(A) $4\pi^2$ mA
(B) 8π mA
(C) 30.3 mA
(D) 45.5 mA

Answer: (A) $4\pi^2$ mA · The council's preliminary key

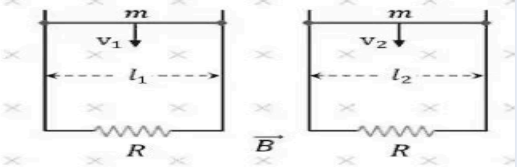
Q87 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

Two horizontal wires of lengths l_1 and l_2, having the same mass m, are free to slide on different vertical rails with velocities v_1 and v_2 respectively, in the same magnetic field $\vec{B}$ as shown in the figure. If a_1 and a_2 are the accelerations of the two horizontal wires respectively, then the necessary condition for $a_1 > a_2$ is _____

(see the figure above)

Mandatory : No

Two horizontal wires of lengths l_1 and l_2, having the same mass m, are free to slide on different vertical rails with velocities v_1 and v_2 respectively, in the same magnetic field $\vec{B}$ as shown in the figure. If a_1 and a_2 are the accelerations of the two horizontal wires respectively, then the necessary condition for $a_1 > a_2$ is _____



ఒక ద్రవ్యరాశి మరియు పొడవులు l_1 , l_2 గల రెండు క్షితిజ సమాంతర తీగలు ఒక ఆయస్కాంత క్షేత్రము $\vec{B}$ లో వేర్వేరు నిలువు పట్టాలపై క్రమముగా v_1 , v_2 వేగాలతో స్వేచ్ఛగా జారుతున్నాయి. ఆ రెండు క్షితిజ సమాంతర తీగల త్వరణాలు క్రమముగా a_1 మరియు a_2 అయితే $a_1 > a_2$ కావడానికి షరతు _____

Options :

1. $\frac{l_1}{l_2} = \frac{v_2}{v_1}$
2. $\frac{l_1}{l_2} = \left(\frac{v_2}{v_1}\right)^2$
3. $\frac{l_1}{l_2} > \left(\frac{v_1}{v_2}\right)^{1/2}$
4. $\frac{l_1}{l_2} > \frac{v_1}{v_2}$

(A) $\frac{l_1}{l_2} = \frac{v_2}{v_1}$
(B) $\frac{l_1}{l_2} = \left(\frac{v_2}{v_1}\right)^2$
(C) $\frac{l_2}{l_1} > \left(\frac{v_1}{v_2}\right)^{1/2}$
(D) $\frac{l_1}{l_2} > \frac{v_1}{v_2}$

Answer: (C) $\frac{l_2}{l_1} > \left(\frac{v_1}{v_2}\right)^{1/2}$ · Checked by our team

Q88 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

A small square loop of wire of side 'l' is placed inside a large square loop of wire if side 'L' ($L \gg l$). The loops are coplanar and their centers coincide. The mutual inductance of the system is proportional to _____

(A) $\frac{l}{L}$
(B) $\frac{l^2}{L}$
(C) $\frac{L}{l}$
(D) $\frac{L^2}{l}$

Answer: (B) $\frac{l^2}{L}$ · The council's preliminary key

Q89 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A copper rod is moved in a magnetic field. The charge developed across its ends will be proportional to _____

(A) Magnetic flux
(B) Rate of change of magnetic flux
(C) 1/ velocity of the rod
(D) 1/ magnitude of the magnetic field

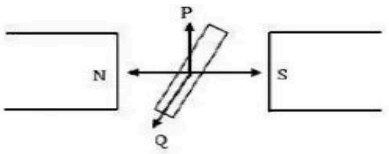
Answer: (B) Rate of change of magnetic flux · The council's preliminary key

Q90 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Figure shows a straight wire placed between the pole pieces of a magnet. Induced emf will be developed across the ends of the wire when it is moved towards *(see the figure above)*

Mandatory : No

Figure shows a straight wire placed between the pole pieces of a magnet. Induced *emf* will be developed across the ends of the wire when it is moved towards



పటంలో చూపిన విధంగా ఒక తిన్నని తీగ అయస్కాంత ధ్రువాల మధ్య ఉంచబడింది. అయితే తీగను ఏ దిశలో కదిపినప్పుడు, దాని చివరల మధ్య వి.దా.బ ప్రేరితమవుతుంది?

Options :

1. N
2. S

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3. P
4. Q

(A) N
(B) S
(C) P
(D) Q

Options (3) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q91 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

A solenoid has 2000 turns wound over a length of $0.30\,\mathrm{m}$. The area of its cross-section is $1.2 \times 10^{-3}\,\mathrm{m}$ (sic). Around its central section, a coil of 300 turns is wound. If an initial current of $2\,\mathrm{A}$ in the solenoid is reversed in $0.25\,\mathrm{s}$, the e.m.f. induced in the coil is equal to:

(A) $6 \times 10^{-4}\,\mathrm{V}$
(B) $4.8 \times 10^{-2}\,\mathrm{V}$
(C) $6 \times 10^{-2}\,\mathrm{V}$
(D) $48\,\mathrm{kV}$

Answer: (B) $4.8 \times 10^{-2}\,\mathrm{V}$ · The council's preliminary key

Q92 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The initial rate of increase of current when a battery of emf $6\ \mathrm{V}$ is connected in series with an inductance of $2\ \mathrm{H}$ and resistance $12\ \Omega$ is _____

(A) $0.5\ \mathrm{A\,s^{-1}}$
(B) $1\ \mathrm{A\,s^{-1}}$
(C) $3\ \mathrm{A\,s^{-1}}$
(D) $4\ \mathrm{A\,s^{-1}}$

Answer: (C) $3\ \mathrm{A\,s^{-1}}$ · The council's preliminary key

Q93 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A magnetic field given by $B(t) = (0.2\,t - 0.05\,t^2)\ T$ is directed perpendicular to the plane of a circular coil containing 25 turns of radius $1.8\ cm$ and whose total resistance is $5\ \Omega$. The power dissipation at 3 seconds is nearly _____

(A) $4\ \mu W$
(B) $7\ \mu W$
(C) $2.3\ \mu W$
(D) $1.25\ \mu W$

Answer: (D) $1.25\ \mu W$ · The council's preliminary key

Q94 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A coil having 500 square loops each of side $10\ cm$ is placed normal to a magnetic flux which increases at a rate of $1\ Ts^{-1}$. The induced emf is _____

(A) $0.1\ V$
(B) $0.5\ V$
(C) $1\ V$
(D) $5\ V$

Answer: (D) $5\ V$ · The council's preliminary key

Q95 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

The self-inductance of a coil is $50\ mH$. When a current of $1\ A$ passing through the coil, reduces to zero at a steady rate in 0.1 second, then find the self-induced emf.

(A) $5\ V$
(B) $0.05\ V$
(C) $50\ V$
(D) $0.5\ V$

Answer: (D) $0.5\ V$ · The council's preliminary key

Q96 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

A conductor moving in the magnetic field 'B' the induced current is 'I'. If the magnetic field is doubled the induced current will _____

(A) Remain the same
(B) be half
(C) be doubled
(D) be four times

Answer: (C) be doubled · The council's preliminary key

Q97 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

An LC circuit contains $196\ pF$ capacitor and a $441\ \mu H$ inductor. The frequency of electromagnetic radiation emitted by antenna coupled to the LC circuit is _____

(A) $7.96 \times 10^5\ Hz$
(B) $54.1 \times 10^5\ Hz$
(C) $79.6 \times 10^5\ Hz$
(D) $5.41 \times 10^5\ Hz$

Answer: (D) $5.41 \times 10^5\ Hz$ · The council's preliminary key

Q98 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

A rectangular loop circuit has a sliding wire PQ as shown in the figure. The loop is placed in a magnetic field 'B', perpendicular to its plane. The resistance of the wire PQ is R. If the wire moves with constant velocity 'v', then find the current flowing through the wire PQ?
(see the figure above)

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Mandatory : No

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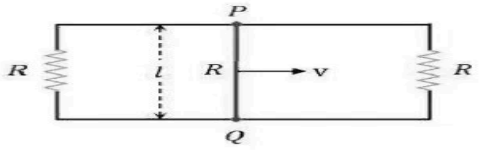
A rectangular loop circuit has a sliding wire PQ as shown in the figure. The loop is placed in a magnetic field 'B', perpendicular to its plane. The resistance of the wire PQ is R. If the wire moves with constant velocity 'v', then find the current flowing through the wire PQ?



పటములో చూపినట్లు ఒక దీర్ఘ చతురస్రాకార లూపు వలయము జారుతున్న తీగ PQ ను కలిగి ఉన్నది. లూపును ఒక అయస్కాంత క్షేత్రము తలానికి లంబముగా ఉందారు. PQ తీగ నిరోధము R. తీగ PQ స్థిరవేగముతో కదులుతుంటే దాని ద్వారా ప్రవహించే విద్యుత్ _____

Options :

1. $\frac{Blv}{3R}$
2. $\frac{Blv}{2R}$
3. $\frac{3Blv}{2R}$
4. $\frac{2Blv}{3R}$

(A) $\frac{Blv}{3R}$
(B) $\frac{Blv}{2R}$
(C) $\frac{3Blv}{2R}$
(D) $\frac{2Blv}{3R}$

Answer: (D) $\frac{2Blv}{3R}$ · The council's preliminary key

Q99 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The current in an inductor of self-inductance $L = 40\ mH$ is to be increased uniformly from 2 A to 12 A in 8 ms. The emf induced in the inductor during this process is _____

(A) 50 V
(B) 0.4 V
(C) 40 V
(D) 100 V

Answer: (A) 50 V · The council's preliminary key

Q100 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The induced emf cannot be produced by:

(A) Moving a magnet near a circuit
(B) Moving a circuit near a magnet
(C) Changing the current in one circuit placed near the other
(D) Maintaining large but constant current in a circuit

Answer: (D) Maintaining large but constant current in a circuit · The council's preliminary key

Q101 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Assertion (A): When plane of coil is perpendicular to magnetic field, magnetic flux linked with the coil is maximum, but induced emf is zero
Reason (R): $\phi = nAB\cos\theta$ and $e = \frac{d\phi}{dt}$

(A) Both A and R are true and R is a correct explanation for A
(B) Both A and R are true but R is not a correct explanation for A
(C) A is true, R is false
(D) A is false, R is true

Answer: (A) Both A and R are true and R is a correct explanation for A · The council's preliminary key

Q102 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Assertion (A): Magnetic flux is a vector quantity.
Reason (R): Value of magnetic flux can be positive negative or zero.

(A) Both A and R are true and R is a correct explanation for A
(B) Both A and R are true but R is not a correct explanation for A
(C) A is true, R is false
(D) A is false, R is true

Answer: (D) A is false, R is true · The council's preliminary key

Q103 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Assertion (A): It is more difficult to move a magnet into a coil with more loops
Reason (R): This is because emf induced in each current loop resists the motion of the magnet

(A) Both A and R are true and R is a correct explanation for A
(B) Both A and R are true but R is not a correct explanation for A
(C) A is true, R is false
(D) A is false, R is true

Answer: (A) Both A and R are true and R is a correct explanation for A · The council's preliminary key

Q104 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Two inductors A and B when connected in parallel are equivalent to a single inductor of inductance $1.5\ H$, and when connected in series are equivalent to a single inductor of inductance $8\ H$. Find the difference in the inductances of A and B.

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(A) $3\ H$
(B) $7.5\ H$
(C) $2\ H$
(D) $4\ H$

Answer: (D) $4\ H$ · The council's preliminary key

Q105 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

A solenoid of length $60\ \text{cm}$ with 15 turns per cm and area of cross section $4 \times 10^{-3}\ \text{m}^2$ completely surrounds another co-axial solenoid of same length and area of cross-section $2 \times 10^{-3}\ \text{m}^2$ with 40 turns per cm. Mutual inductance of the system is _____

(A) $9\ \text{mH}$
(B) $6\ \text{mH}$
(C) $3\ \text{mH}$
(D) $10\ \text{mH}$

Answer: (A) $9\ \text{mH}$ · The council's preliminary key

Q106 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A circular coil of area 100 cm^2 & 20 turns is kept in magnetic field of flux density 2 Wb- m^2. It rotates from a position where its plane makes an angle of 30° with the field to a position perpendicular to the field in a time 0.2 sec. Find the magnitude of the emf induced in the coil due to its rotation

(A) 2 V
(B) 3 V
(C) 1.5 V
(D) 1 V

Answer: (D) 1 V · The council's preliminary key

Q107 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

When a metal rod of length ℓ is placed in a magnetic field $\vec{B}$ and moved with velocity V perpendicular to the field, then the induced emf across its ends is

(A) $B\ell V$
(B) $\frac{B\ell}{V}$
(C) $\frac{V}{B\ell}$
(D) $eB\ell$

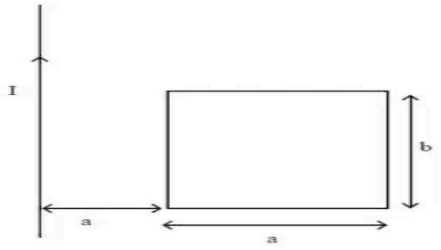
Answer: (A) $B\ell V$ · The council's preliminary key

Q108 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

A long straight wire carrying current I and a rectangular frame with side lengths a and b lie in the same plane as shown in the figure. The mutual inductance of the wire and frame is

(see the figure above)

A long straight wire carrying current I and a rectangular frame with side lengths a and b lie in the same plane as shown in the figure. The mutual inductance of the wire and frame is



Options :

1. $\frac{\mu_0}{2\pi} ab$
2. $\frac{\mu}{4\pi} \frac{b}{a}$
3. $\frac{\mu_0 a}{2\pi} \ln 2$
4. $\frac{\mu_0 b}{2\pi} \ln 2$

(A) $\frac{\mu_0}{2\pi} ab$

(B) $\frac{\mu}{4\pi} \frac{b}{a}$ (sic)

(C) $\frac{\mu_0 a}{2\pi} \ln 2$

(D) $\frac{\mu_0 b}{2\pi} \ln 2$

Answer: (D) $\frac{\mu_0 b}{2\pi} \ln 2$ · The council's preliminary key

Q109 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A coil of resistance $50\ \Omega$ is connected across a 5.0 V battery. If the current in the coil is found to be 50 mA after time t = 0.1 s battery is connected, then the inductance of the coil is

(A) $\frac{5}{\ln(2)}$

(B) $10 \ln(2)$

(C) $5e^4$

(D) $\frac{10}{e^4}$

Answer: (A) $\frac{5}{\ln(2)}$ · The council's preliminary key

Q110 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

An infinitely long cylinder is kept parallel to an uniform magnetic field B directed along the positive z-axis. The direction of induced current as seen from the z-axis will be

(A) zero
(B) along the magnetic field
(C) clockwise of the +ve z-axis
(D) anti-clockwise of the +ve z-axis

Answer: (A) zero · The council's preliminary key

Q111 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

A long straight solenoid with cross sectional radius 'a' and number of turns per unit length 'n' has a current varying with time as $I(\mathrm{As}^{-1})$. The magnitude of the electric field as a function of distance 'r' from the solenoid axis is

(A) $\frac{n\mu_0 a^2 I}{2r}$
(B) $\frac{\mu_0 In}{2a}$
(C) $\frac{na^2 I}{2\mu_0 r}$
(D) $\frac{\mu_0 Ia}{2n}$

Answer: (A) $\frac{n\mu_0 a^2 I}{2r}$ · The council's preliminary key

Q112 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The emf induced in the secondary coil due to unit rate of change of current in the primary is called _____

(A) Impedance of two coils
(B) Reactance of two coils
(C) Mutual induction of two coils
(D) Self induction of a coil

Answer: (C) Mutual induction of two coils · The council's preliminary key

Q113 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The magnetic flux through a circuit of resistance R changes by an amount $\Delta\phi$ in time Δt. Then the total quantity of electric charge Q, which is passing during this time through any point of the circuit is given by _____

(A) $Q = \frac{\Delta\phi}{\Delta t}$
(B) $Q = \frac{\Delta\phi}{\Delta t} \times R$
(C) $Q = -\frac{\Delta\phi}{\Delta t} + R$
(D) $Q = \frac{\Delta\phi}{R}$

Answer: (D) $Q = \frac{\Delta\phi}{R}$ · The council's preliminary key

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Q114 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

A coil of area $10\ \mathrm{m}^2$ is placed in a uniform magnetic field of $0.3\ k\ lb.m^{-2}$, with its plane perpendicular to the field. The coil rotates at a uniform rate to complete the revolution in 8 s. find the average e.m.f. in the coil during intervals when the coil rotates from
i. 0° to 90° position
ii. 90° to 180° position
iii. 180° to 270° position
iv. 270° to 360° position

(A) ${}^{3}/_{2}V;\ {}^{3}/_{2}V;\ {}^{-3}/_{2}V;\ {}^{-3}/_{2}V$
(B) ${}^{3}/_{2}V;\ {}^{-3}/_{2}V;\ {}^{3}/_{2}V;\ {}^{-3}/_{2}V$
(C) $0\ V;\ 0\ V;\ 0\ V;\ 0\ V$
(D) ${}^{-3}/_{2}V;\ {}^{-3}/_{2}V;\ {}^{3}/_{2}V;\ {}^{3}/_{2}V$

Answer: (A) ${}^{3}/_{2}V;\ {}^{3}/_{2}V;\ {}^{-3}/_{2}V;\ {}^{-3}/_{2}V$ · The council's preliminary key

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Q115 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The Lenz's law gives

(A) The direction of induced current
(B) the quantity of charge flowing
(C) the magnitude of the induced emf
(D) motional emf in the circuit

Answer: (A) The direction of induced current · The council's preliminary key

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Q116 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Consider the situation shown in the figure. The wire AB is sliding on the fixed rails with a constant velocity. If the wire AB is replaced by semicircular wire, the magnitude of the induced current will

_____

(see the figure above)

Orientation : Vertical

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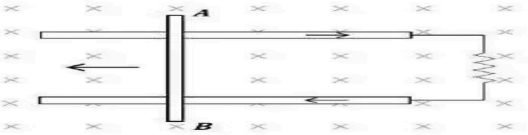
Consider the situation shown in the figure. The wire AB is sliding on the fixed rails with a constant velocity. If the wire AB is replaced by semicircular wire, the magnitude of the induced current will _____

పటములో విశదీకరించిన విధముగా ఒక AB అనే తీగ స్థిర వేగముతో పట్టాలపై దొర్లుతుంది. ఆ తీగని ఒక అర్ధవృత్తాకార తీగతో మార్చితే ప్రేరితమయ్యే విద్యుత్



Options :

1. Increase
పెరుగుతుంది

2. Remain the same
మార్పు చెందదు

3. Decrease
తగ్గుతుంది

4. Increase or decrease depending whether the semicircle bulges towards the resistance or away from it
అర్ధవృత్తము నిరోధము దిశలో లేదా ప్రతిదిశలో ఉబ్బడము ద్వారా పెరగడము కానీ, తగ్గడము కానీ జరుగుతుంది

(A) Increase
(B) Remain the same
(C) Decrease
(D) Increase or decrease depending whether the semicircle bulges towards the resistance or away from it

Answer: (B) Remain the same · The council's preliminary key

Q117 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

Lenz's law is consequence of the law of conservation of _____

(A) Charge
(B) Momentum
(C) Mass
(D) Energy

Answer: (D) Energy · The council's preliminary key

Q118 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A rod of length 1.0 m is rotated in a plane perpendicular to a uniform magnetic field of induction 0.25 T with a frequency of 12 rev/s. The induced emf across the ends of the rod is

(A) 18.89 V
(B) 3 V
(C) 15 V
(D) 9.42 V

Answer: (D) 9.42 V · The council's preliminary key

Q119 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

The magnitude of induced emf is directly proportional to the rate of change of magnetic flux linked with the coil. This statement is known as _____

(A) Ohm's law
(B) Lenz's law
(C) Faraday's law
(D) Ampere's law

Answer: (C) Faraday's law · The council's preliminary key

Q120 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

A tuned circuit of a transistor oscillator unit has an inductance of $5\,mH$ and a capacitance of $5\,pF$. The natural frequency of the oscillator is _____

(A) $100\,kHz$
(B) $1\,GHz$
(C) $10\,MHz$
(D) $1\,MHz$

Answer: (D) $1\,MHz$ · The council's preliminary key

Q121 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

A current $I = 10\,A$ is passed through the part of a circuit shown in the figure. What will be the potential difference between A and B when 'I' is decreased at constant rate of $10^2\ \mathrm{A.s^{-1}}$ at the beginning?
(see the figure above)

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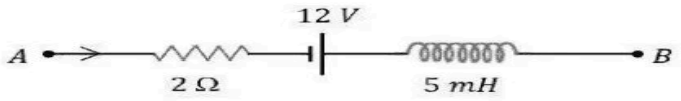
Orientation : Vertical

A current $I = 10\ A$ is passed through the part of a circuit shown in the figure. What will be the potential difference between A and B when 'I' is decreased at constant rate of $10^2\ A.s^{-1}$ at the beginning?

పటములో చూపిన విధముగా $I = 10\ A$ విద్యుత్ వలయములో ఒక భాగములో ప్రవహిస్తుంది. విద్యుత్ప్రవాహము ఒక స్థిరమయిన రేటు $10^2\ A.s^{-1}$ ప్రారంభంలో తగ్గించిన, A, B ల మధ్య పొటన్షియల్ భేదము ఎంత?



Options :

1. $-7.5\ V$
2. $3.5\ V$
3. $-3.5\ V$
4. $4\ V$

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(A) $-7.5\,V$
(B) $3.5\,V$
(C) $-3.5\,V$
(D) $4\,V$

Answer: (A) $-7.5\,V$ · The council's preliminary key

Q122 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The energy stored in a $50\,\mathrm{mH}$ inductor carrying a current of $4\,\mathrm{A}$ is _____

(A) 0.4 J
(B) 4.0 J
(C) 0.8 J
(D) 0.04 J

Answer: (A) 0.4 J · The council's preliminary key

Q123 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The coefficient of mutual inductance between the primary and the secondary coil of a transformer is $0.2\,\mathrm{H}$. When the current in the primary changes by $5\,\mathrm{A.s^{-1}}$, the induced $e.m.f.$ in the secondary will be

(A) $5\,\mathrm{V}$
(B) $1\,\mathrm{V}$
(C) $25\,\mathrm{V}$
(D) $10\,\mathrm{V}$

Answer: (B) $1\,\mathrm{V}$ · The council's preliminary key

Q124 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

What is the phase difference between the flux linked with a coil rotating in a magnetic field, and the induced $e.m.f.$ produced in it?

(A) 0
(B) $\frac{\pi}{4}$
(C) $\frac{\pi}{2}$
(D) π

Answer: (C) $\frac{\pi}{2}$ · The council's preliminary key

Q125 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

A coil of inductance L is divided in to four equal parts and all the parts are connected in parallel. The effective inductance of the combination is _____

(A) $\frac{L}{4}$
(B) $\frac{L}{8}$
(C) $\frac{L}{16}$
(D) $4L$

Answer: (C) $\frac{L}{16}$ · The council's preliminary key

Q126 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The energy stored in a coil of inductance L, carrying a steady current i is in the form

(A) Magnetic
(B) Electrical
(C) Both magnetic and electrical
(D) Heat

Answer: (A) Magnetic · The council's preliminary key

Q127 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

The current in a coil changes from 3 A to 1 A in 0.1 s in a coil of self inductance 8 mH. The emf induced in the coil is

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(A) $16\ V$
(B) $1.6 \times 10^{-2}\ V$
(C) $16 \times 10^{-2}\ V$
(D) $2\ V$

Answer: (C) $16 \times 10^{-2}\ V$ · The council's preliminary key

Q128 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Lenz's law is a consequence of the law of conservation of _____

(A) Energy
(B) Charge
(C) Linear momentary (sic)
(D) Electric flux

Answer: (A) Energy · The council's preliminary key

Q129 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Two concentric circular coils, one of small radius r and the other of large radius R are placed co-axially with centers coinciding. If the radius r is changed by 2%, then the change in mutual inductance of the arrangement is
(Assume r<<R)

(A) 2 %
(B) 1.5 %
(C) 4 %
(D) 0 %

Answer: (C) 4 % · Official TGCHE final key

Q130 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Consider two solenoids X and Y such that the area and length of Y are twice that of X respectively, of the magnetic energy stored in both the solenoids is same, then the ratio of magnitude of magnetic fields of the two solenoids $\frac{|\vec{B}_X|}{|\vec{B}_Y|}$ is

(A) 1 : 4
(B) 2 : 1
(C) 1 : 2
(D) 4 : 1

Answer: (B) 2 : 1 · Official TGCHE final key

Q131 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A circular coil consists 70 closely wound turns and has a radius of 10 cm. An externally produced magnetic field of magnitude 2×10^{-3} T is applied perpendicular to the coil. The net flux through the coil is found to vanish when the current in the coil is 2.2 A. The inductance of the coil is

(A) 2 mH
(B) 3 mH
(C) 4 mH
(D) 1.5 mH

Answer: (A) 2 mH · Official TGCHE final key

Q132 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A varying current in a coil changes from 10 A to zero in 1.5 sec. If the average emf induced in the coil is 200 V, the self inductance of the coil is

(A) 25 H
(B) 30 H
(C) 50 H
(D) 45 H

Answer: (B) 30 H · Official TGCHE final key

Q133 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

Two straight conducting rails form a right angle as shown below. A conducting bar in contact with the rails starts at the vertex at time t = 0 and moves with constant velocity of v = 5 m/s along them. A magnetic field with B = 0.1 T is directed out of the page. The absolute value of the emf around the triangle at the time t = 4 s will be?

(see the figure above)

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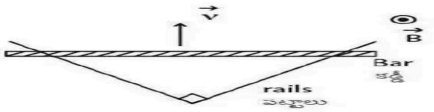
Question Number : 112 Question Id : 719650272 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

Two straight conducting rails form a right angle as shown below. A conducting bar in contact with the rails starts at the vertex at time $t = 0$ and moves with constant velocity of $v = 5$ m/s along them. A magnetic field with $B = 0.1$ T is directed out of the page. The absolute value of the emf around the triangle at the time $t = 4$ s will be?

ఈ క్రింద చూపినట్లు రెండు తిన్నని వాహక పట్టాలు ఒకదానితో ఒకటి లంబముగా వున్నాయి. $t = 0$ కాలం వద్ద ఒక వాహక కడ్డి పట్టాల శీర్షము వద్ద తాకినట్లు వుండి $v = 5$ m/s స్థిర వేగముతో ఈ రెండు పట్టాల గుండా కదులుతుంది. పటలంనకి లంబముగా $B = 0.1$ T గల అయస్కాంత క్షేత్రము పటం నుండి బాహ్యముగా ఏర్పాటుచేయబడింది. అయిన ఆ త్రిభుజాకారములో $t = 4$ s కాలం వద్ద ఏర్పడే విద్యుత్చాలక బలము (emf) సంపూర్ణ విలువ



Options :

1. 10 V
2. 15 V
3. 20 V
4. 30 V

(A) 10 V
(B) 15 V
(C) 20 V
(D) 30 V

Answer: (C) 20 V · Official TGCHE final key

Q134 TS EAMCET 2019 · 6 May · Shift 1 MCQ

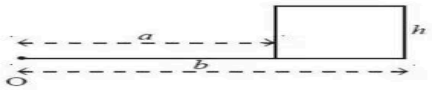
Consider a toroid with rectangular cross section, of inner radius 'a', outer radius 'b' and height 'h', carrying 'n' number of turns. Then the self inductance of the toroidal coil when current 'I' passing through the toroid is

(see the figure above)

Question Number : 112 Question Id : 7512365072 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider a toroid with rectangular cross section, of inner radius 'a', outer radius 'b' and height 'h', carrying 'n' number of turns. Then the self inductance of the toroidal coil when current 'I' passing through the toroid is

'n' చుట్ల సంఖ్య కలిగి దీర్ఘచతురస్రాకార అడ్డుకోత, అంతర వ్యాసార్ధము 'a', బాహ్య వ్యాసార్ధము 'b' మరియు ఎత్తు 'h' లు కలిగిన ఒక టొరాయిడ్‌ను పరిగణించుము. టొరాయిడ్ గుండా 'I' విద్యుత్ ప్రవాహము ప్రసరిస్తున్నప్పుడు టొరాయిడ్ తీగచుట్ట స్వయం ప్రేరకత్వము విలువ



Options :

1. $\frac{\mu_0 n^2 h}{2\pi} ln\left(\frac{b}{a}\right)$
2. $\frac{\mu_0 n h}{2\pi} ln\left(\frac{b}{a}\right)$
3. $\frac{\mu_0 n^2 h}{2\pi} ln\left(\frac{a}{b}\right)$
4. $\frac{\mu_0 n h}{2\pi} ln\left(\frac{a}{b}\right)$

(A) $\frac{\mu_0 n^2 h}{2\pi} ln\left(\frac{b}{a}\right)$
(B) $\frac{\mu_0 n h}{2\pi} ln\left(\frac{b}{a}\right)$
(C) $\frac{\mu_0 n^2 h}{2\pi} ln\left(\frac{a}{b}\right)$
(D) $\frac{\mu_0 n h}{2\pi} ln\left(\frac{a}{b}\right)$

Answer: (A) $\frac{\mu_0 n^2 h}{2\pi} ln\left(\frac{b}{a}\right)$ · Official TGCHE final key

Q135 TS EAMCET 2019 · 4 May · Shift 1 MCQ

Consider a current in a circuit falls from 6.0 A to 1.0 A in 0.2 s. If an average emf of 150 V is induced by the circuit, then the self inductance of the circuit is:

(A) 2 H
(B) 6 H
(C) 4 H
(D) 8 H

Answer: (B) 6 H · Official TGCHE final key

Q136 TS EAMCET 2019 · 4 May · Shift 1 MCQ

The magnetic field of an Electromagnetic wave obeys the relation in a certain region is $B = 10^{-12}\sin(5 \times 10^6 t)$ T, where t is the time. Then the induced emf, in a 300-turn coil of area 20 cm^2 oriented perpendicular to the field is

(A) $-2 \times 10^{-5} \cos(5 \times 10^{6} t)$ V
(B) $-3 \times 10^{-6} \cos(5 \times 10^{6} t)$ V
(C) $-2.5 \times 10^{-6} \cos(5 \times 10^{6} t)$ V
(D) $-3.3 \times 10^{-6} \cos(5 \times 10^{6} t)$ V

Answer: (B) $-3 \times 10^{-6} \cos(5 \times 10^{6} t)$ V · Official TGCHE final key

Q137 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A rod of length 80 cm rotates about its mid point with a frequency of 10 rev/s. The potential difference (in Volts) between two ends of the rod due to a magnetic field B $= 0.5$ T directed perpendicular to the rod is

(A) π
(B) 1.6π
(C) 2π
(D) 0.8π

Answer: (B) 1.6π · Official TGCHE final key

Q138 TS EAMCET 2019 · 3 May · Shift 1 MCQ

A 10 Ω coil of 180 turns and diameter 4 cm is placed in a uniform magnetic field so that the magnetic flux is maximum through the coil's cross-sectional area. When the field is suddenly removed a charge of 360 μC flows through a 618 Ω galvanometer connected to the coil, find the magnetic field:

(A) 12 T
(B) 6 T
(C) 1 T
(D) 8 T

Answer: (C) 1 T · Official TGCHE final key

Q139 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A metal disc of radius $a = 10$ cm rotates with a constant angular speed of $\omega = 200$ rad/s about its axis. The potential difference between the centre and the rim of the disc under a uniform magnetic field $B = 5$ mT directed perpendicular to the disc, is

(A) 2 mV
(B) 5 mV
(C) 10 mV
(D) 15 mV

Answer: (B) 5 mV · Official TGCHE final key

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Q140 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A conducting wire bent in the shape of semicircle has length L and moves in its plane with constant velocity v. A uniform magnetic field B exists in the direction perpendicular to the plane of the wire. The velocity makes an angle 45° to the diameter joining free ends and the emf induced between the ends of the wire is $\Phi = \alpha(BVL)$. The value of constant α is

(A) $\sqrt{2}$
(B) $\frac{2}{\pi}$
(C) $\frac{1}{\sqrt{2}}$
(D) $\frac{\sqrt{2}}{\pi}$

Answer: (D) $\frac{\sqrt{2}}{\pi}$ · Official TGCHE final key

Q141 TS EAMCET 2019 · 3 May · Shift 2 MCQ

The concept of displacement current solves an ambiguity in

(A) Gauss's law
(B) Faraday's law
(C) Ampere's law
(D) Coulomb's law

Answer: (C) Ampere's law · Official TGCHE final key

Q142 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

A long solenoid with 2000 turns per metre has a small loop of radius $3\ \text{cm}$ placed inside the solenoid normal to its axis. If the current through the solenoid increases steadily from $1.5\ \text{A}$ to $5.5\ \text{A}$ in $\frac{\pi^2}{100}$ s, the induced emf in the loop is

(A) $0.144\ \text{mV}$
(B) $0.288\ \text{mV}$
(C) $0.072\ \text{mV}$
(D) $0.316\ \text{mV}$

Answer: (B) $0.288\ \text{mV}$ · Official APSCHE final key

Q143 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

Two concentric coplanar circular conducting loops have radii R and r ($\text{R} \gg r$). Their mutual inductance is proportional to

(A) $\frac{r}{\mathrm{R}}$
(B) $\frac{\mathrm{R}}{r}$
(C) $\frac{r^2}{\mathrm{R}}$
(D) $\frac{\mathrm{R}^2}{r}$

Answer: (C) $\frac{r^2}{\mathrm{R}}$ · Official APSCHE final key

Q144 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A circular coil of area $0.1\ \mathrm{m}^2$ having 200 turns is placed in a magnetic field of $40\ \mathrm{T}$. The plane of the coil makes 30° with the field. If the field is removed for $0.1\ \mathrm{s}$ then the induced emf in the coil is

(A) $4000\ \mathrm{V}$
(B) $4000\sqrt{3}\ \mathrm{V}$
(C) $2000\ \mathrm{V}$
(D) $2000\sqrt{3}\ \mathrm{V}$

Answer: (A) $4000\ \mathrm{V}$ · Official APSCHE final key

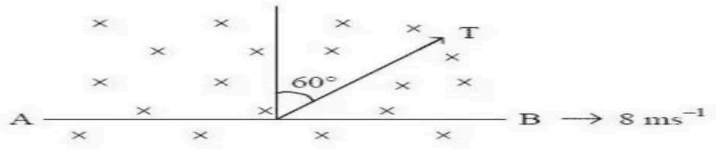
Q145 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A metal rod AB of length 50 cm is moving at a velocity $8\ \mathrm{ms}^{-1}$ in a magnetic field of 2 T. If the field is at 60° with the plane of motion as shown in figure, then the potentials V_A and V_B are related by *(see the figure above)*

Question Number : 113 Question Id : 1874634113 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A metal rod AB of length 50 cm is moving at a velocity 8 ms^{-1} in a magnetic field of 2 T. If the field is at 60° with the plane of motion as shown in figure, then the potentials $\mathrm{V_A}$ and $\mathrm{V_B}$ are related by

50 cm పొడవుగల ఒక లోహపు కడ్డీ AB, 8 ms^{-1} వేగముతో 2 T అయస్కాంత క్షేత్రంలో కదులుతున్నది. పటంలో చూపిన విధంగా ఆ క్షేత్రం చలన తలానికి 60° కోణంలో ఉంటే, $\mathrm{V_A}$ మరియు $\mathrm{V_B}$ పొటెన్షియల్ల మధ్య సంబంధం



Options :

1. $\mathrm{V_A} - \mathrm{V_B} = 8\ \mathrm{V}$
2. $\mathrm{V_A} - \mathrm{V_B} = 4\ \mathrm{V}$
3. $\mathrm{V_B} - \mathrm{V_A} = 8\ \mathrm{V}$
4. $\mathrm{V_B} - \mathrm{V_A} = 4\ \mathrm{V}$

(A) $V_A - V_B = 8\,\text{V}$
(B) $V_A - V_B = 4\,\text{V}$
(C) $V_B - V_A = 8\,\text{V}$
(D) $V_B - V_A = 4\,\text{V}$

Answer: (B) $V_A - V_B = 4\,\text{V}$ · Official APSCHE final key

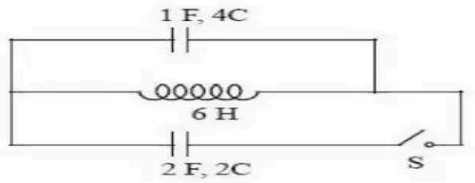
Q146 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

In the given electrical circuit, if the switch S is closed then the maximum energy stored in the inductor is
(see the figure above)

Question Number : 114 Question Id : 1874634114 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the given electrical circuit, if the switch S is closed then the maximum energy stored in the inductor is

ఇచ్చిన విద్యుత్ వలయంలో, స్విచ్ 'S' ను మూసిన, ప్రేరకంలో నిల్వ ఉన్న గరిష్ఠ శక్తి



Options :
1. 3 J
2. 9 J
3. 12 J
4. 6 J

(A) 3 J
(B) 9 J
(C) 12 J
(D) 6 J

Answer: (D) 6 J · Official APSCHE final key

Q147 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A coil of mean area $500\ \text{cm}^2$ and having 1000 turns is held with its plane perpendicular to a uniform field of 0.4 G. If the coil is turned through 180° in $\frac{1}{10}$ second, then the average induced emf is
$(1\ \text{G} = 10^{-4}\ \text{T})$

(A) 0.04 V
(B) 0.4 V
(C) 4 V
(D) 40 V

Answer: (A) 0.04 V · Official APSCHE final key

Q148 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

An emf of 15 V is applied to a circuit containing 5 H inductance and $10\ \Omega$ resistance. The ratio of currents at time $t = \infty$ and $t = 1$ s is

(A) $\frac{e}{e^2-1}$
(B) $\frac{e^2}{e-1}$
(C) $\frac{e}{1-e^2}$
(D) $\frac{e^2}{e^2-1}$

Answer: (D) $\frac{e^2}{e^2-1}$ · Official APSCHE final key

Q149 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

To measure a magnetic field between the magnetic poles of a loud speaker, a small coil having 30 turns and $2.5\ \text{cm}^2$ area is placed perpendicular to the field and removed immediately. If the total charge flown through the coil is 7.5×10^{-3} C, and the total resistance of wire and galvanometer is 0.3 Ω, then the magnitude of the magnetic field is

(A) 0.03 T
(B) 0.3 T
(C) 3 T
(D) 3×10^2 T

Answer: (B) 0.3 T · Official APSCHE final key

Q150 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

In an oscillating LC circuit, the maximum charge on the capacitor is Q. The charge on the capacitor when the energy is stored equally between the electric and magnetic fields is

(A) $\frac{Q}{2}$
(B) $\frac{Q}{\sqrt{3}}$
(C) Q
(D) $\frac{Q}{\sqrt{2}}$

Answer: (D) $\frac{Q}{\sqrt{2}}$ · Official APSCHE final key

Q151 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

A coil is placed in a time varying magnetic field. The power dissipated due to current induced in the coil is P_1. If the number of turns is doubled and radius of the wire is halved, the power dissipated is P_2. Then $\mathrm{P}_1 : \mathrm{P}_2$ is

(A) $1 : 4$
(B) $3 : 2$
(C) $2 : 1$
(D) $4 : 1$

Answer: (C) $2 : 1$ · Checked by our team

Q152 TS EAMCET 2018 · 7 May · Shift 1 MCQ

A solenoid of radius R has 'n' turns per unit length. The self-inductance of the solenoid per unit length is

(A) $\mu_0 n \pi R^2$
(B) $\mu_0 n R^2$
(C) $\mu_0 n^2 R^2$
(D) $\mu_0 n^2 \pi R^2$

Answer: (D) $\mu_0 n^2 \pi R^2$ · The council's preliminary key

Q153 TS EAMCET 2018 · 5 May · Shift 1 MCQ

A rectangular loop of wire is placed in the XY plane with its side of length 3 cm parallel to the X-axis and the side of length 4 cm parallel to the Y - axis. It is moving in the positive X direction with the speed 10 cm/sec. A magnetic field exists in the space with its direction parallel to the Z - axis. The field decreases by 2×10^{-3} T/cm along the positive X - axis and increases in time by 2×10^{-2} T/sec. The induced emf in the wire is

(A) -4.8×10^{-5} V
(B) 4.8×10^{-5} V
(C) 0
(D) 3.6×10^{-5} V

Answer: (C) 0 · The council's preliminary key

Q154 TS EAMCET 2018 · 5 May · Shift 2 MCQ

A wheel with radial metal spokes $1\ \mathrm{m}$ in length is rotated in a magnetic field of $0.5 \times 10^{-4}\ T$ normal to the plane of the wheel. If the emf induced between the rim and axle is $\pi/3000\ \mathrm{V}$, the rotational speed of the wheel in revolutions per minute is

EdLoop EAPCET

(A) 400
(B) 500
(C) 600
(D) 700

Answer: (A) 400 · The council's preliminary key

Q155 TS EAMCET 2018 · 5 May · Shift 2 MCQ

An initially charged undriven LCR circuit having inductance L, capacitance C and resistance R will

(A) Oscillate with frequency $\frac{1}{\sqrt{LC}}$
(B) Oscillate without damping if $R^2 < \frac{4L}{C}$
(C) Oscillate with damping if $R^2 > \frac{4L}{C}$
(D) Oscillate with damping if $R^2 < \frac{4L}{C}$

Answer: (D) Oscillate with damping if $R^2 < \frac{4L}{C}$ · The council's preliminary key

Q156 TS EAMCET 2018 · 4 May · Shift 1 MCQ

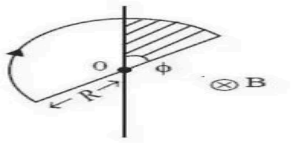
A wire loop enclosing a semi-circle of radius 'R' is located on the boundary of a uniform magnetic field of induction $\vec{B}$. At time $t = 0$, the loop is set into rotation with velocity 'ω' about its axis '0', coinciding with a line of vector $\vec{B}$ on the boundary as shown in the figure. The emf induced in the loop is

(see the figure above)

Question Number : 112 Question Id : 4928631712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct : 1 Wrong : 0

A wire loop enclosing a semi-circle of radius 'R' is located on the boundary of a unifor magnetic field of induction $\vec{B}$. At time $t = 0$, the loop is set into rotation with velocity ' about its axis '0', coinciding with a line of vector $\vec{B}$ on the boundary as shown in the figu The emf induced in the loop is

ఒక తీగ వలయం, R వ్యాసార్ధంగల అర్ధవృత్తాకారాన్ని కలిగి ఏకరీతి అయస్కాంత క్షేత్ర ప్రేరణ $\vec{B}$ అంచు వద్ద ఉంచారు. వలయాన్ని $t = 0$ వద్ద దాని అక్షం '0', అంచుల వద్ద $\vec{B}$ సదిశతో ఏకీకృతముగునట 'ω' వేగంతో పటంలో చూపిన విధంగా భ్రమణం చెందించారు. వలయంలో ప్రేరితమైన విద్యుచ్చా బలం విలువ



Options :
1. $\frac{BR^2}{2}\omega$
2. $BR\omega$
3. $BR^2\omega$
4. $\frac{BR^2}{2\omega}$

(A) $\frac{BR^2}{2}\omega$

(B) $BR\omega$

(C) $BR^2\omega$

(D) $\frac{BR^2}{2\omega}$

Answer: (A) $\frac{BR^2}{2}\omega$ · The council's preliminary key

Q157 TS EAMCET 2018 · 4 May · Shift 1 MCQ

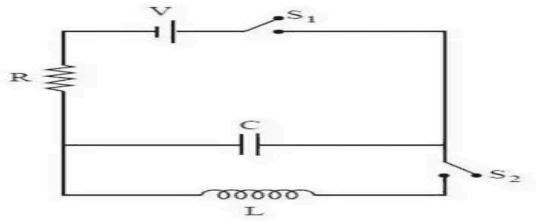
In the circuit given below, the capacitor C is charged by closing the switch S_1 and opening the switch S_2. After charging, the switch S_1 is opened and S_2 is closed, then the maximum current in the circuit *(see the figure above)*

Question Number : 113 Question Id : 4928631713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

In the circuit given below, the capacitor C is charged by closing the switch S_1 and openi the switch S_2. After charging, the switch S_1 is opened and S_2 is closed, then the maximu current in the circuit

క్రింద ఇచ్చిన వలయంలో, కండెన్సర్ C ని S_1 మీటను మూసి మరియు S_2 మీటను తెరిచి ఆవేశపూరిత చేసారు. ఆవేశ పూరితం కాగానే, S_1 మీటను తెరిచి మరియు S_2 మీటను మూసివేసారు. అప్పుడు వలయంలో ప్రవహించు గరిష్ఠ విద్యుత్ ప్రవాహము



Options :

1. $V\sqrt{\frac{L}{C}}$
2. $V\sqrt{\frac{C}{L}}$
3. $\frac{V}{2\pi}\sqrt{\frac{L}{C}}$
4. $2\pi V\sqrt{\frac{L}{C}}$

(A) $V\sqrt{\frac{L}{C}}$

(B) $V\sqrt{\frac{C}{L}}$

(C) $\frac{V}{2\pi}\sqrt{\frac{L}{C}}$

(D) $2\pi V\sqrt{\frac{L}{C}}$

Answer: (B) $V\sqrt{\frac{C}{L}}$ · The council's preliminary key

Q158 TS EAMCET 2018 · 4 May · Shift 2 MCQ

A conducting rod of length L lies in X-Y plane and makes an angle 30° with the X-axis. One end of the rod lies at origin initially. A magnetic field also exists in the region pointing along positive Z-direction. The magnitude of the magnetic field varies with y as $B_0\left(\frac{y}{L}\right)^3$ where B_0 is a constants. At some instant the rod starts moving with a velocity v_0 along X-axis. The emf induced in the rod is

(A) $\frac{B_0 v_0 L}{64}$
(B) $\frac{B_0 v_0 L}{16}$
(C) $B_0 v_0 L$
(D) $64\, B_0 v_0 L$

Answer: (A) $\frac{B_0 v_0 L}{64}$ · The council's preliminary key

Q159 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

Two circular loops of diameters 0.6 cm and 40 cm are kept coaxially with a separation of 15 cm between their centers. If a current 2 A flows through the smaller loop, the flux linked with the bigger loop is (approximately)

(A) 9.0×10^{-11} Wb
(B) 0.9×10^{-11} Wb
(C) 1.8×10^{-11} Wb
(D) 2.7×10^{-11} Wb

Answer: (A) 9.0×10^{-11} Wb · The council's preliminary key

Q160 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A current carrying circular loop is perpendicular to a magnetic field of induction 10^{-4} T. If the radius of the loop starts shrinking at a uniform rate of $2\ \mathrm{mms}^{-1}$, then the emf induced in the loop at the instant when its radius is 20 cm will be _____

(A) $0.02\pi\ \mu$V
(B) $0.08\pi\ \mu$V
(C) $0.03\pi\ \mu$V
(D) $0.05\pi\ \mu$V

Answer: (B) $0.08\pi\ \mu$V · The council's preliminary key

Q161 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

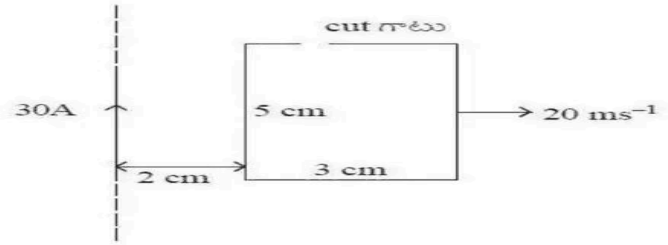
A rectangular wire loop of sides 5 cm and 3 cm with a small cut is moving away from an infinitely long straight wire carrying a current of 30 A with a velocity of $20\ \mathrm{ms}^{-1}$ as shown in the figure. The emf induced across the cut is

(see the figure above)

Question Number : 113 Question Id : 4557344593 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A rectangular wire loop of sides 5 cm and 3 cm with a small cut is moving away from an infinitely long straight wire carrying a current of 30 A with a velocity of 20 ms^{-1} as shown in the figure. The emf induced across the cut is

ఒక చిన్నగాటు కలిగి, 5 cm మరియు 3 cm భుజాలు గల ఒక దీర్ఘచతురస్రాకార తీగ లూప్ 30 A ప్రవాహం గల ఒక అనంతమైన పొడవు గల తిన్నటి తీగ నుండి 20 ms^{-1} వేగంతో పటంలో చూపిన విధంగా కదులుచున్నది. గాటు వద్ద ప్రేరితమయ్యే emf



Options :

1. 50 μV
2. 75 μV
3. 180 μV
4. 150 μV

(A) 50 μV
(B) 75 μV
(C) 180 μV
(D) 150 μV

Answer: (C) 180 μV · The council's preliminary key

Q162 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

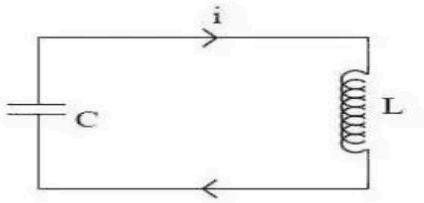
In the given L-C circuit, inductance is 80 μH and capacitance is 20 μF. The maximum potential difference across the capacitor is 80 V. The maximum current is

(see the figure above)

Question Number : 114 Question Id : 4557344594 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the given L-C circuit, inductance is 80 μH and capacitance is 20 μF. The maximum potential difference across the capacitor is 80 V. The maximum current is

ఈ క్రింది L-C వలయములో ప్రేరకత్వం 80 μH మరియు కెపాసిటెన్స్ 20 μF. కెపాసిటర్ మధ్య గల గరిష్ఠ పొటెన్షియల్ భేదము 80 V. అయిన గరిష్ఠ విద్యుత్ ప్రవాహము.



Options :

1. 200 A
2. 40 A
3. 800 A
4. 100 A

(A) 200 A

(B) 40 A

(C) 800 A

(D) 100 A

Answer: (B) 40 A · The council's preliminary key

Q163 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A coil of wire of radius 'r' has 600 turns and self inductance of 108 mH. The self inductance of a coil with same radius and 500 turns is _____

(A) 80 mH

(B) 75 mH

(C) 108 mH

(D) 90 mH

Answer: (B) 75 mH · The council's preliminary key

Q164 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

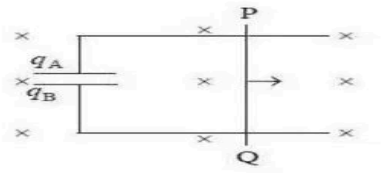
A conducting rod PQ of length $1\ \mathrm{m}$ is moving with a uniform speed $2\ \mathrm{ms}^{-1}$ in a uniform magnetic field of $4\ \mathrm{T}$ which is directed into the paper. A capacitor of capacity $10\ \mu\mathrm{F}$ is connected as shown in the figure. Then the charges on the plates of the capacitor are

(see the figure above)

Question Number : 113 Question Id : 4557343793 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A conducting rod PQ of length 1 m is moving with a uniform speed 2 ms^{-1} in a uniform magnetic field of 4 T which is directed into the paper. A capacitor of capacity 10 μF is connected as shown in the figure. Then the charges on the plates of the capacitor are

కాగితం తలానికి లంబంగా, తలంలోనికి గల 4 T ఏకరీతి అయస్కాంత క్షేత్రంలో 1 m పొడవుగల ఒక వాహక కడ్డీ PQ 2 ms^{-1} సమవడితో కదులుచున్నది. 10 μF కెపాసిటి కల కెపాసిటర్‌ను పటములో చూపిన విధంగా కలిపినారు. అయితే కెపాసిటర్ పలకలపై ఆవేశాలు



Options :

1. $q_A = +80\ \mu C\ ;\ q_B = -80\ \mu C$
2. $q_A = -80\ \mu C\ ;\ q_B = +80\ \mu C$
3. $q_A = +1.25\ \mu C\ ;\ q_B = -1.25\ \mu C$
4. $q_A = -1.25\ \mu C\ ;\ q_B = +1.25\ \mu C$

(A) $q_A = +80\ \mu C\ ;\ q_B = -80\ \mu C$

(B) $q_A = -80\ \mu C\ ;\ q_B = +80\ \mu C$

(C) $q_A = +1.25\ \mu C\ ;\ q_B = -1.25\ \mu C$

(D) $q_A = -1.25\ \mu C\ ;\ q_B = +1.25\ \mu C$

Answer: (A) $q_A = +80\ \mu C\ ;\ q_B = -80\ \mu C$ · The council's preliminary key

Q165 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The length of a wire required to make a solenoid of length 'l' and self induction 'L' is

(A) $\sqrt{\frac{4\pi Ll}{\mu_0}}$

(B) $\sqrt{\frac{Ll}{4\pi\mu_0}}$

(C) $\sqrt{\frac{2\pi Ll}{\mu_0}}$

(D) $\sqrt{\frac{\mu_0 Ll}{4\pi}}$

Answer: (A) $\sqrt{\frac{4\pi Ll}{\mu_0}}$ · The council's preliminary key

Q166 TS EAMCET 2017 · 12 May · Offline MCQ

A coil having 'n' turns and resistance $R\,\Omega$ is connected with a galvanometer of resistance $4R\,\Omega$. This combination is moved in time 't' seconds from a magnetic flux ϕ_1 Weber to ϕ_2 Weber. The induced current in the circuit is

(A) $\frac{\phi_2 - \phi_1}{5Rnt}$
(B) $-\frac{n(\phi_2 - \phi_1)}{5Rt}$
(C) $-\frac{(\phi_2 - \phi_1)}{Rnt}$
(D) $-\frac{n(\phi_2 - \phi_1)}{Rt}$

Answer: (B) $-\frac{n(\phi_2 - \phi_1)}{5Rt}$ · The council's preliminary key

Q167 TS EAMCET 2017 · 12 May · Offline MCQ

Consider a metal ball of radius 'r' moving at a constant velocity 'v' in a uniform magnetic field of induction $\bar{B}$. Assuming that the direction of velocity forms an angle 'α' with the direction of $\bar{B}$, the maximum potential difference between points on the ball is

(A) $r|\bar{B}||\bar{v}|\sin\alpha$
(B) $|\bar{B}||\bar{v}|\sin\alpha$
(C) $2r|\bar{B}||\bar{v}|\sin\alpha$
(D) $2r|\bar{B}||\bar{v}|\cos\alpha$

Answer: (C) $2r|\bar{B}||\bar{v}|\sin\alpha$ · The council's preliminary key

Q168 TS EAMCET 2017 · 12 May · Offline MCQ

Consider a solenoid carrying current supplied by a DC source with a constant emf containing iron core inside it. When the core is pulled out of the solenoid, the change in current will

(A) remain same
(B) decrease
(C) increase
(D) modulate

Answer: (C) increase · The council's preliminary key

Q169 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

Assertion (A): It is more difficult to push a magnet into a coil with more number of turns
Reason (R): The emf induced in a coil opposes the motion of a magnet when it is moved towards the coil.

(A) Both A and R are true. R is correct explanation of A.
(B) Both A and R are true. R is not correct explanation of A
(C) A is true, R is false
(D) A is false, R is true

Answer: (A) Both A and R are true. R is correct explanation of A. · The council's preliminary key

Q170 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

A circular wheel with 10 spokes with its plane vertical along East-West is rotating about its natural axis with a uniform speed 100 revolutions per minute in the earth's magnetic field. Radius of the wheel is 0.3 m. If the emf induced between the centre of the wheel and the rim is $3\pi\ \mu\text{V}$, angle of dip at the place is

(Vertical component of the earth's magnetic field $B_V = 15\ \mu\text{T}$)

(A) $\tan^{-1}\left(\frac{1}{2}\right)$

(B) $\tan^{-1}\left(\frac{4}{5}\right)$

(C) $\tan^{-1}\left(\frac{3}{5}\right)$

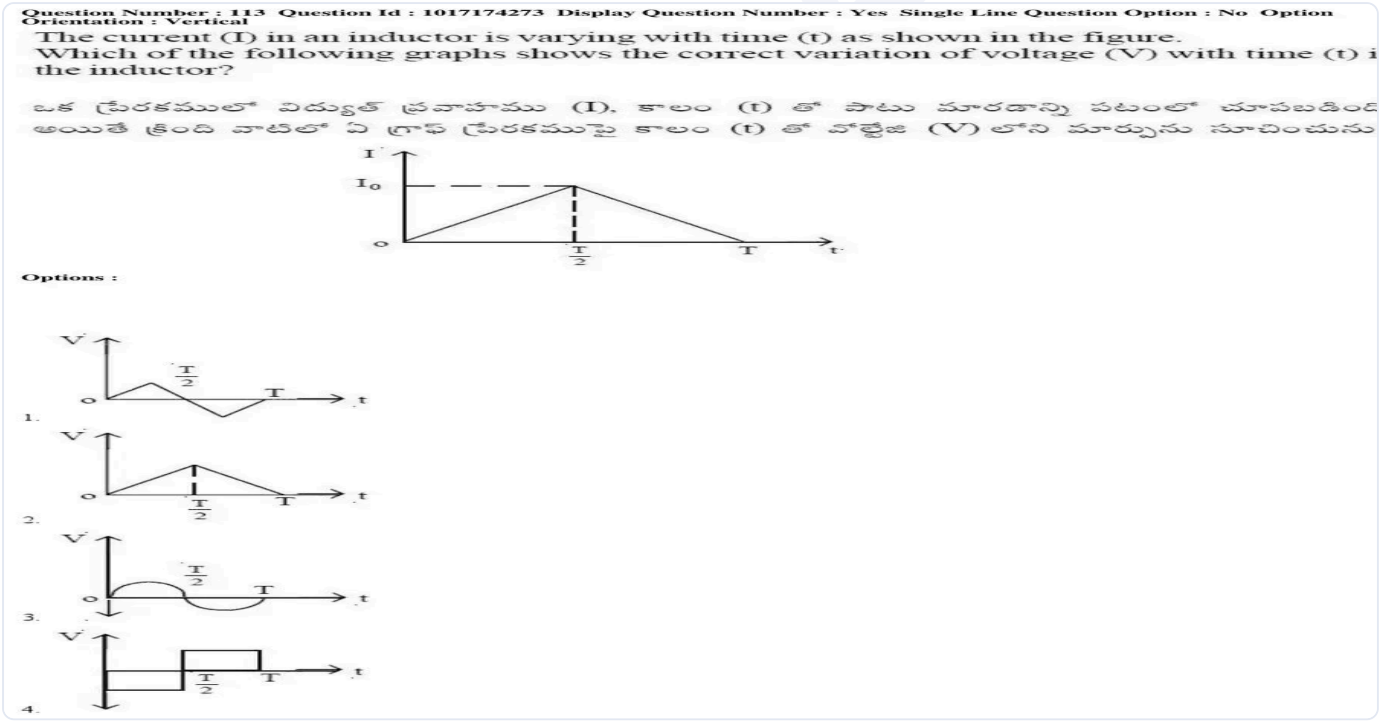
(D) $\tan^{-1}\left(\frac{3}{4}\right)$

Answer: (D) $\tan^{-1}\left(\frac{3}{4}\right)$ · The council's preliminary key

Q171 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

The current (I) in an inductor is varying with time (t) as shown in the figure. Which of the following graphs shows the correct variation of voltage (V) with time (t) in the inductor?

(see the figure above)



(A) *see figure*

(B) *see figure*

(C) *see figure*

(D) *see figure*

Answer: (D) · The council's preliminary key

Q172 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

The magnetic flux linked with a closed coil is increased to a maximum value in 2 s and its relation with time is $\phi = at^2 + bt + c$ then the relation between a, b and c is

(A) $a = -b$
(B) $a = \frac{-b}{4}$
(C) $a + b = c$
(D) $ac = \frac{b}{2}$

Answer: (B) $a = \frac{-b}{4}$ · The council's preliminary key

Q173 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A circular loop made of thin copper wire of mass 'm' is placed in a uniform magnetic field such that the plane of the loop is perpendicular to the magnetic field. If 'd' and 'ρ' are the density and resistivity of copper respectively and the magnetic field varies at a constant rate of $\frac{dB}{dt}$, then the induced current in the loop is _____

(A) $\frac{4\pi m}{\rho d}\left(\frac{dB}{dt}\right)$
(B) $\frac{4m}{\pi\rho d}\left(\frac{dB}{dt}\right)$
(C) $\frac{\pi m}{4\rho d}\left(\frac{dB}{dt}\right)$
(D) $\frac{m}{4\pi\rho d}\left(\frac{dB}{dt}\right)$

Answer: (D) $\frac{m}{4\pi\rho d}\left(\frac{dB}{dt}\right)$ · The council's preliminary key

Q174 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

A rectangular loop is provided with sliding connector of length 1 m and resistance 2 Ω. It is placed in a uniform magnetic field of 2 T perpendicular to the plane of the loop. The external force required to keep the connector moving with uniform velocity 2 ms^{-1} is

(A) 6 N
(B) 4 N
(C) 2 N
(D) 1 N

Answer: (B) 4 N · The council's preliminary key

Q175 TS EAMCET 2016 · 15 May · Offline MCQ

Two coils have mutual inductance 0.005 H. The current changes in the first coil according to equation $I = I_0 \sin \omega t$, where $I_0 = 10$ A and $\omega = 100\,\pi$ rad s^{-1}. The maximum value of emf in the second coil is

(A) 5
(B) 5π
(C) 0.5π
(D) π

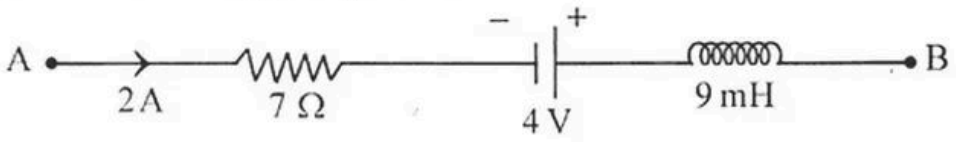
Answer: (B) 5π · Official TGCHE final key

Q176 AP EAMCET 2016 · 29 Apr · Offline MCQ

A branch of a circuit is shown in the figure. If current is decreasing at the rate of 10^3 As^{-1}, the potential difference between A and B is *(see the figure above)*

113. A branch of a circuit is shown in the figure. If current is decreasing at the rate of 10^3 As^{-1}, the potential difference between A and B is

ఒక వలయంలోని ఒక భాగాన్ని పటంలో చూపినారు. విద్యుత్ ప్రవాహము 10^3 As^{-1} చొప్పున తగ్గుతూ ఉంటే, A మరియు B ల మధ్య పొటెన్షియల్ తేడా



(1) 1 V (2) 5 V (3) 10 V (4) 2 V

(A) 1 V
(B) 5 V
(C) 10 V
(D) 2 V

Answer: (A) 1 V · The council's preliminary key

Q177 AP EAMCET 2016 · 29 Apr · Offline MCQ

The natural frequency of an LC circuit is 125 kHz. When the capacitor is totally filled with a dielectric material, the natural frequency decreases by 25 kHz. Dielectric constant of the material is nearly

(A) 3.33
(B) 2.12
(C) 1.56
(D) 1.91

Answer: (C) 1.56 · The council's preliminary key

Q178 AP EAMCET 2014 · 22 May · Offline MCQ

A coil of wire of radius r has 600 turns and a self inductance of 108 mH. The self inductance of a coil with same radius and 500 turns is

(A) 80 mH
(B) 75 mH
(C) 108 mH
(D) 90 mH

Answer: (B) 75 mH · The council's preliminary key

Q179 AP EAMCET 2012 · 12 May · Offline MCQ

A primary coil and secondary coil are placed close to each other. A current, which changes at the rate of 25 amp in a millisecond, is present in the primary coil. If the mutual inductance is 92×10^{-6} Henries, then the value of induced emf in the secondary coil is

(A) 4.6 V
(B) 2.3 V
(C) 0.368 mV
(D) 0.23 mV

Answer: (B) 2.3 V · Official APSCHE final key

Q180 AP EAMCET 2011 · 8 May · Offline MCQ

A constant voltage of 25 V is applied to a series L-R circuit at $t = 0$, by closing a switch. What is the potential difference across the resistor and the inductor at time $t = 0$?

(A) 0 V, 25 V
(B) 12.5 V, 12.5 V
(C) 10 V, 15 V
(D) 25 V, 0 V

Answer: (A) 0 V, 25 V · The council's preliminary key

Q181 AP EAMCET 2010 · 30 May · Offline MCQ

The time constant of inductance coil is 3 m sec. When a 90 Ω resistance is joined in series, then the time constant becomes 0.5 m sec. The inductance and the resistance of the coil are :

(A) 54 mH, 18 Ω
(B) 14 mH, 42 Ω
(C) 42 mH, 14 Ω
(D) 14 mH, 60 Ω

Answer: (A) 54 mH, 18 Ω · Official APSCHE final key