**PHYSICS 2021 - 22 March 14, 2022**

**Today’s Agenda (Day 121)**

1. HOUSEKEEPING ITEMS

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1. HOMEWORK CHECK:

🡪 Project Operation Beagle

🡪 Ch 24 & 25 Vocabulary

1. CLASS ACTIVITY

🡪BEGIN: Chapter 25 PPT Review

1. **Section 25.1 – Inducing Currents**
2. Section 25.2 – Applications of Induced Current

HOMEWORK:

* READ: Chapter 25 – Electromagnetic Induction
* STUDY: Chapter 24 & 25 Vocabulary Quiz AND Chapter 25 Test

<http://glencoe.mheducation.com/sites/0078807220/student_view0/self-check_quizzes.html>

Chapter 24 – Magnetic Fields

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| --- | --- | --- | --- | --- |
| Polarized | Magnetic field | Solenoid | Galvanometer | Armature |
| Domain | Magnetic flux | Electromagnet | Electric motor |  |

Chapter 25 – Electromagnetic Induction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Electromagnetic induction | Electric generator | Eddy current | Transformer | Step-up transformer |
| Induced electromotive force | Lenz’s law | Self-inductance | Mutual inductance | Step-down transformer |

REMINDERS:

* **QUIZ: Ch 24 & 25 Vocabulary – March 15**
* TEST: Chapter 25 🡪 March 17

**PHYSICS 2021 - 22 Review Questions**

**CH 25 PRACTICE PROBLEMS**

SECTION 25.1

1. You move a straight wire that is 0.5 m long at a speed of 20 m/s vertically through a 0.4-T magnetic field pointed in the horizontal direction.

a. What EMF is induced in the wire? b. The wire is part of a circuit with a total resistance of 6.0 Ω. What is the current?

1. A straight wire that is 25 m long is mounted on an airplane flying at 125 m/s. The wire moves in a perpendicular direction through Earth’s magnetic field (B = 5.0×10−5 T). What EMF is induced in the wire?
2. A straight wire segment in a circuit is 30.0 m long and moves at 2.0 m/s perpendicular to a magnetic

field.

a. A 6.0-V EMF is induced. What is the magnetic field? b. The total resistance of the circuit is 5.0 Ω. What is the current?

4.  A horseshoe magnet is mounted so that the magnetic field lines are vertical. You pass a straight wire between the poles and pull it toward you. The current through the wire is from right to left. Which is the magnet’s north pole? Explain.

5. A generator develops a maximum potential difference of 170 V.

a. What is the effective potential difference?

b. A 60W lamp is placed across the generator with an Imax of 0.70. What is the effective current through the lamp?

c. What is the resistance of the lamp?

6.The RMS potential difference of an AC household outlet is 117 V. What is the maximum potential difference across a lamp connected to the outlet? If the RMS current through the lamp is 5.5 A, what is the lamp’s maximum current?

7. If the average power used over time by an electric light is 75W, what is the peak power?

8. An AC generator delivers a peak potential difference of 425 V.

a) What is the Veff in a circuit connected to the generator?

b) The resistance is 5.0 x 102 Ώ . What is the effective current?

SECTION 25.2

1. A step-down transformer has 7500 turns on its primary coil and 125 turns on its secondary coil. The potential difference across the primary circuit is 7.2 kV. What is the potential difference across the secondary circuit? If the current in the secondary circuit is 36 A, what is the current in the primary circuit?
2. A step-up transformer has 300 turns on its primary coil and 90,000 turns on its secondary coil. The potential difference of the generator to which the primary circuit is attached is 60.0 V. The transformer is 95 percent efficient. What is the potential difference across the secondary circuit? The current in the secondary circuit is 0.50 A. What current is in the primary circuit?
3. You hang a coil of wire with its ends joined so it can swing easily. If you now plunge a magnet into the coil, the coil will start to swing. Which way will it swing relative to the magnet and why?
4. If you unplugged a running vacuum cleaner from a wall outlet, you would be much more likely to see a spark than you would be if you unplugged a lighted lamp from the wall. Why?
5. Explain why a transformer may be operated only on alternating current.
6. Frequently, transformer coils that have only a few turns are made of very thick (low-resistance) wire, while those with many turns are made of thin wire. Why?