

## Worksheet: Electromagnetic Induction

IB · Class 12 · Physics · 9 questions · 26 marks

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 26

**Q1.** A coil of area  $0.05 \text{ m}^2$  is placed with its plane perpendicular to a field of  $0.4 \text{ T}$ . Find the flux through it. *[2 marks]*

---

---

---

**Q2.** The flux through a 200-turn coil falls from  $0.06 \text{ Wb}$  to  $0.02 \text{ Wb}$  in  $0.1 \text{ s}$ . Find the average induced emf. *[2 marks]*

---

---

---

**Q3.** A rod of length  $0.5 \text{ m}$  moves at  $4.0 \text{ m/s}$  perpendicular to a field of  $0.30 \text{ T}$ . Find the emf across its ends. *[2 marks]*

---

---

---

**Q4.** A rod of length  $0.8 \text{ m}$  rotates about one end at  $50 \text{ rad/s}$  in a field of  $0.20 \text{ T}$  normal to its plane of rotation. Find the emf between the ends. *[3 marks]*

---

---

---

**Q5.** The current in a coil falls from  $4.0 \text{ A}$  to  $0$  in  $0.05 \text{ s}$ , inducing an average emf of  $80 \text{ V}$ . Find the self-inductance. *[3 marks]*

---

---

---

**Q6.** Two coils have a mutual inductance of 0.8 H. If the current in the first changes from 2.0 A to 6.0 A in 0.2 s, find the emf induced in the second and the change in flux linkage. *[3 marks]*

---

---

---

**Q7.** A solenoid 40 cm long with 800 turns and area  $5.0 \times 10^{-4} \text{ m}^2$  carries 2.0 A. Find its inductance and the energy stored. *[4 marks]*

---

---

---

**Q8.** A coil of 100 turns and area  $0.02 \text{ m}^2$  rotates at 50 rad/s in a field of 0.5 T. Find the peak emf and state the coil orientation at which it occurs. *[4 marks]*

---

---

---

**Q9.** A bar magnet is moved away from a closed coil with its north pole facing the coil. State the direction of the induced current as seen from the magnet, and justify it by energy conservation. *[3 marks]*

---

---

---