

SYJC PHYSICS - SAMPLE PAPER
TOPICS - Oscillations, E.M. Induction
Time 1 hour
Marks: 25

Std :- XII-Sci
Time :- 1 Hr. Sub :- PHYSICS Mark :- 25
(Oscillations, Electromagnetic induction)

Sec-A 08

Select the correct alternative from the following

Q.1. Negative sign appearing in Faraday's law of electromagnetic induction indicates that
a) the induced e. m. f. is produced only when magnetic flux decreases
b) the induced emf is opposite to the direction of magnetic flux
c) the induced emf opposes the changes in magnetic flux
d) the induced e. m. f. is produced only when magnetic flux increases

Q.2. The period of SHM of a particle with maximum velocity 50 cm/s and maximum acceleration is 10 cm/s^2 is....
a) 31.42 s b) 6.284 s c) 3.142 s d) 0.3142 s

Q.3. A 100 mH coil carries 1 A current. Energy stored in its magnetic field is
a) 1 J b) 0.5 J c) 0.05 J d) 0.1 J

Q.4. If the length of simple pendulum is doubled keeping its amplitude constant its energy will be ...
a) unchanged b) doubled c) halved d) increase to 4 time of its initial energy

Write the answer in one sentence

Q.5. Explain phenomenon of self induction.
Q.6. Define linear simple harmonic motion.
Q.7. State Faraday's law of electromagnetic induction.
Q.8. Define ideal simple pendulum. 06

Sec-B

Q.9. Explain the concept of mutual induction.
Q.10. Obtain differential equation in linear SHM.
Q.11. Define period and frequency of SHM.

OR

Q.11. A search coil having 2000 turns with area 1.5 cm^2 is placed in a magnetic field of 0.60 T. The coil is moved rapidly out of the field in a time of 0.2 s. Calculate the induced emf in the search coil. 06

Sec-C

Q.12. State Lenz's law of EMI Explain it is consequence of law of conservation of energy.
Q.13. Find the period of a magnet vibrating in uniform magnetic field.

OR

Q.13. Total energy of a body of mass 2 kg performing SHM is 40 J. Find its speed while crossing the center of the path. 05

Sec-D

Q.14. State the principle of transformer. Explain its construction and working.
Derive an expression for the ratio of emfs in terms of no. of turns in the primary and secondary coils.
An emf of 96.0 mV is induced in the 3 winding of a coil when the current in a nearby coil is increasing at the rate of 1.20 A/s. What is the mutual inductance of the two coils ?

OR

Q.14. Find the total energy of particle performing linear SHM.
Define phase of SHM and Angular SHM.