

- _____ 8. How does an electromagnetic wave propagate itself?
- A changing electric field induces a magnetic field perpendicular to the electric field.
 - Changing electric and magnetic fields produce a transverse wave that is perpendicular to both of the oscillating fields.
 - A changing magnetic field induces an electric field perpendicular to the magnetic field.
 - all of the above
- _____ 9. A step-down transformer has 2500 turns on its primary and 5.0×10^1 turns on its secondary. If the potential difference across the primary is 4850 V, what is the potential difference across the secondary?
- 1.0 V
 - 97 V
 - 240 V
 - 110 V
- _____ 10. Which of the following statements about electromagnetic radiation is true?
- It transports the energy of electromagnetic waves.
 - It transfers energy to objects in the path of the electromagnetic waves.
 - It can be converted to other energy forms.
 - all of the above
- _____ 11. Which conversion process is the basic function of the electric generator?
- electrical energy to mechanical energy
 - low emf to high emf, or vice versa
 - mechanical energy to electrical energy
 - alternating current to direct current
- _____ 12. A generator's maximum output is 220 V. What is the rms potential difference?
- 110 V
 - 150 V
 - 310 V
 - 160 V
- _____ 13. Electricity may be generated by rotating a loop of wire between the poles of a magnet. The induced current is greatest when
- the plane of the loop is perpendicular to the magnetic field.
 - the plane of the loop is parallel to the magnetic field.
 - the magnetic flux through the loop is a minimum.
 - the plane of the loop makes an angle of 45° with the magnetic field.
- _____ 14. Electromagnetic waves are _____ electric and magnetic fields.
- transverse
 - parallel
 - constant
 - oscillating
- _____ 15. An ac generator has a maximum emf output of 150 V. What is the rms current in the circuit when the generator is connected to a 35Ω resistor?
- 2.6 A
 - 1.5 A
 - 3.1 A
 - 1.2 A
- _____ 16. An ac generator has a maximum output emf of 215 V. What is the rms potential difference?
- 145 V
 - 304 V
 - 152 V
 - 216 V
- _____ 17. A current can be induced in a closed circuit without the use of a battery or an electrical power supply by moving the circuit through a
- magnetic field.
 - high temperature field.
 - gravitational field.
 - nuclear field.

- _____ 18. A bar magnet falls through a loop of wire with constant velocity, and the north pole enters the loop first. The induced current will be greatest when the magnet is located so that the loop is
- With no acceleration, the induced current is zero.
 - near the middle of the magnet.
 - near either the north or the south pole.
 - near the north pole only.
- _____ 19. A generator supplies an rms current of 1.66 A. If the resistance of the circuit is 66.0Ω , what is the maximum emf?
- 156 V
 - 77.5 V
 - 38.7 V
 - 125 V
- _____ 20. According to Lenz's law, if the applied magnetic field changes,
- the induced field attempts to keep the total field strength constant.
 - the induced field attempts to decrease the total field strength.
 - the induced field attempts to increase the total field strength.
 - the induced field attempts to oscillate about an equilibrium value.
- _____ 21. Where is energy stored in electromagnetic waves?
- in the oscillating electric and magnetic fields
 - in the wave's moving atoms
 - in the wave's directional vector
 - in the electromagnetic force
- _____ 22. Under which condition is the back emf in an electric motor at its maximum value?
- Current is at maximum.
 - Motor speed is at maximum.
 - Motor speed is zero.
 - Voltage is at maximum.
- _____ 23. Which conversion process is the basic function of the electric motor?
- mechanical energy to electrical energy
 - electrical energy to mechanical energy
 - alternating current to direct current
 - low emf to high emf, or vice versa
- _____ 24. In most electric generators, either the armature or the magnetic field is _____, generating a(n) _____.
- turned off; temporary dipole
 - interrupted; impulse change
 - nonconducting; flux line
 - rotated; induced current
- _____ 25. Which of the following options can be used to generate electricity?
- Change the orientation of the circuit loop with respect to the magnetic field.
 - Change the magnetic field strength around the circuit loop.
 - Move the circuit loop into and out of a magnetic field.
 - all of the above
- _____ 26. In a two-coil system, the induced potential difference in the secondary coil depends on
- the switch being kept open.
 - the number of turns of wire.
 - the iron ring around which the coils are wrapped.
 - the orientation of the coils being kept constant.
- _____ 27. An electric current that changes directions at regular intervals is called
- directional current.
 - reversible current.
 - fluctuating current.
 - alternating current.

- _____ 28. All of the following statements about ac rms values and maximum values are true *except* which one?
- a. Rms values are approximately 70 percent of the maximum values.
 - b. Rms values are always less than maximum values.
 - c. Rms values may equal maximum values.
 - d. Rms values are different from maximum values because the alternating current is at its maximum only for an instant.
- _____ 29. What do radio waves, microwaves, X rays, and gamma rays all have in common?
- a. They are detected in the same way.
 - b. They are produced in the same way.
 - c. They are electromagnetic waves.
 - d. They store the same amount of energy.
- _____ 30. A loop of wire is rotated 360° across an external magnetic field. During one period of revolution, the induced current changes in
- a. amplitude.
 - b. magnitude only.
 - c. direction only.
 - d. both magnitude and direction.

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