

FIRST REVISION TEST - 2024	12 - STD	
PHYSICS	Marks 70	Time 3.00 Hrs.

YouTube/ Akwa Academy PART - I

I. Answer all the questions.

15 x 1 = 15

1. An inductor 20mH, a capacitor 50 μ F and a resistor 40 Ω are connected in series across a source of emf $V = 10 \sin 340t$. The power loss in AC circuit is
 - a) 7.6 W
 - b) 0.89 W
 - c) 0.46 W
 - d) 0.67 W
2. In an electron microscope, the electrons are accelerated by a voltage of 14KV. If the voltage is changed to 224KV, then the de-Broglie wavelength associated with the electrons would
 - a) decrease by 4 times
 - b) increase by 2 times
 - c) increase by 4 times
 - d) decrease by 2 times
3. Which of the following is an electromagnetic wave?
 - a) β -rays
 - b) γ -rays
 - c) α -rays
 - d) All of the above
4. The variation of frequency of carrier wave with respect to the instantaneous amplitude of the modulating signal is called
 - a) phase modulation
 - b) Amplitude modulation
 - c) Pulse width modulation
 - d) Frequency modulation
5. If the angular speed of rotation of an armature of AC generator is doubled, the induced emf will be
 - a) same
 - b) doubled
 - c) halved
 - d) quadrupled
6. Which range of frequencies is suitable for skywave propagation?
 - a) 20 KHz to 250 KHz
 - b) 500 KHz to 1500 KHz
 - c) 10 MHz to 200 MHz
 - d) 3 MHz to 30 MHz
7. If in nuclear fusion process, the masses of the fusing nuclei be m_1 and m_2 and the mass of the resultant is m_3 , then
 - a) $m_3 = m_1 + m_2$
 - b) $m_3 = (m_1 - m_2)$
 - c) $m_3 < (m_1 + m_2)$
 - d) $m_3 > (m_1 + m_2)$
8. If a half wave rectified voltage is fed to a load resistor, which part of a cycle the load current will flow?
 - a) $0^\circ - 90^\circ$
 - b) $90^\circ - 180^\circ$
 - c) $0^\circ - 180^\circ$
 - d) $0^\circ - 360^\circ$
9. If a current of 7.5A is maintained in a wire for 45 seconds then the charge flowing through the wire is
 - a) 6C
 - b) 365.5 C
 - c) 3 C
 - d) 337.5 C
10. The ratio of Kinetic energy to the total energy of an electron in a Bohr orbit of the hydrogen atom is
 - a) 1 : -2
 - b) 1 : -1
 - c) 1 : 1
 - d) 2 : -1
11. Two nuclei have mass numbers in the ratio 1 : 8. Find the ratio of their nuclear radii
 - a) 1 : 8
 - b) 1 : 2
 - c) 2 : 1
 - d) 8 : 1
12. A system consists of N_0 nucleus at $t = 0$, then number of nuclei remaining after half of a half life ($t = 1/2 T_{1/2}$)
 - a) $\frac{N_0}{2}$
 - b) $\frac{N_0}{\sqrt{2}}$
 - c) $\frac{N_0}{4}$
 - d) $\frac{N_0}{8}$

13. If the input to the NOT gate is $A = 1001$, then its output is
 a) 1000 b) 0100 c) 0110 d) 0011
14. The strongest source of gravitational waves is
 a) Sun b) Stars c) Neutron star d) black holes
15. At infinity, the electrostatic potential is
 a) infinity b) maximum c) minimum d) zero

II. Answer any 6 questions. Q.No. 24 is compulsory.

6 x 2 = 12

16. How will you increase the current sensitivity of a galvanometer?
17. What is displacement current?
18. State Fleming's right hand rule.
19. Differentiate between Joule's heating effect and peltier effect.
20. Define electric potential. Give a relation between electric field and electric potential.
21. In a nuclear fission 0.1% mass is converted into energy. Calculate the energy released by the fission of 1kg mass. [YouTube/ Akwa Academy](#)
22. Calculate the radius of ${}_{79}^{197}\text{Au}$ nucleus.
23. Mention any two advantages and disadvantages of Robotics.
24. The angle of minimum deviation for the equilateral prism is 40° . Find the refractive index of the material of the prism.

III. Answer any 6 questions. Q.No. 33 is compulsory.

6 x 3 = 18

25. Derive the relation between f and R for a spherical mirror.
26. List out the laws of photo electric effect.
27. Draw the circuit diagram of NPN transistor in Common Emitter Configuration.
28. Give the uses of Polaroids.
29. Derive the expression for resultant capacitance when capacitors are connected in series.
30. Write short note on absorption spectra.
31. When the resistors connected in series and parallel their equivalent resistances are 15Ω and $56/15\Omega$ respectively. Find the two resistances.
32. State and prove de-morgan's theorems.
33. In a transistor connected in the common base configuration, $\alpha = 0.95$, $I_E = 1\text{mA}$. Calculate the values of I_C and I_B .

IV. Answer all the questions.

5 x 5 = 25

34. a) Derive an expression for phase angle between the applied voltage and current in a series RLC circuit. (OR)
 b) Describe the Fizeau's method to determine speed of the light.
35. a) Explain the construction and working of full wave rectifier. (OR)
 b) Explain the construction and working of transformer.
36. a) Derive an expression for electro static potential due to an electric dipole. (OR)
 b) Obtain the equation for band width in Young's Double Slit Experiment.
37. a) using Biot-Savart Law deduce the relation for the magnetic field at a point due to an infinitely long straight conductor carrying current. (OR)
 b) Discuss the spectral series of hydrogen atom.
38. a) Obtain Lens maker's formula (OR)
 b) Explain the determination of the internal resistance of cell using voltmeter.