

RS-1

FIRST REVISION EXAMINATION - 2024 - 2025

12 - Std

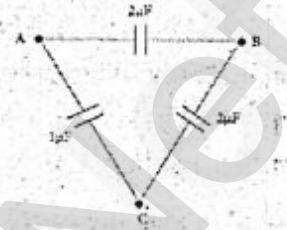
PHYSICS

Time : 3 Hr

Total : 70

CHOOSE THE BEST ANSWER :**15X1=15**

1. Three capacitors are connected in triangle as shown in the figure. The equivalent capacitance between the points A and C is
 (a) $1\mu F$ (b) $2\mu F$ (c) $3\mu F$ (d) $\frac{1}{4}\mu F$
2. In a large building, there are 15 bulbs of 40W, 5 bulbs of 100W, 5 fans of 80W and 1 heater of 1kW are connected. The voltage of electric mains is 220V. The minimum capacity of the main fuse of the building will be
 (a) 14 A (b) 8 A (c) 10 A (d) 12A
3. A circular coil of radius 5 cm and 50 turns carries a current of 3 ampere. The magnetic dipole moment of the coil is
 (a) 10 amp-m² (b) 1.2 amp -m² (c) 0.5 amp -m² (d) 0.8 amp-m²
4. In a series resonant RLC circuit, the voltage across 100 Ω resistor is 40 V. The resonant frequency ω is 250 rad/s. If the value of C is 4 μF then the voltage across L is
 (a) 600 V (b) 4000 V (c) 400V (d) 1 V
5. An e.m. wave is propagating in a medium with a velocity $\vec{v} = v\hat{i}$. The instantaneous oscillating electric field of this e.m. wave is along +y-axis, then the direction of oscillating magnetic field of the e.m. wave will be along:
 (a) -y direction (b) -x direction (c) +z direction (d) -z direction
6. A ray of light travelling in a transparent medium of refractive index n falls, on a surface separating the medium from air at an angle of incidence of 45°. The ray can undergo total internal reflection for the following n,
 (a) n = 1.25 (b) n = 1.33 (c) n = 1.4 (d) n = 1.5
7. A ray of light strikes a glass plate at an angle 60°. If the reflected and refracted rays are perpendicular to each other, the refractive index of the glass is,
 (a) $\sqrt{3}$ (b) $\frac{3}{2}$ (c) $\sqrt{\frac{3}{2}}$ (d) 2
8. In photoelectric emission, a radiation whose frequency is 2 times threshold frequency of a certain metal is incident on the metal. Then the maximum possible velocity of the emitted electron will be
 (a) $\sqrt{\frac{h\nu_0}{m}}$ (b) $\sqrt{\frac{6h\nu_0}{m}}$ (c) $\sqrt{\frac{2h\nu_0}{m}}$ (d) $\sqrt{\frac{h\nu_0}{2m}}$
9. A radioactive nucleus (initial number A and atomic number Z) emits 2 α and 2 positrons. The ratio of number of neutrons to that of proton in the final nucleus will be
 (a) $\frac{A-Z-4}{Z-2}$ (b) $\frac{A-Z-2}{Z-6}$ (c) $\frac{A-Z-4}{Z-6}$ (d) $\frac{A-Z-12}{Z-4}$
10. If the input to the NOT gate is A = 0011, its output is
 (a) 0100 (b) 1000 (c) 1100 (d) 0011
11. The particle size of ZnO material is 30 nm. Based on the dimension it is classified as
 (a) Bulk material (b) Nanomaterial (c) Soft material (d) Magnetic material
12. The heat energy produced in a resistance of 10 Ω when 5 A current flows through it for 5 minutes is
 (a) 250J (b) 250kJ (c) 75kJ (d) 7500J
13. A coil of 200 turns carries a current of 0.4 A. If the magnetic flux of 4 Wb is linked with the coil, then the inductance of the coil is
 (a) 4H (b) 4000H (c) 2H (d) 2000H



14. The ratio of the intensities of lights with wavelengths 500nm and 300nm which undergo Rayleigh scattering is
 (a) 625:81 (b) 5:3 (c) 3:5 (d) 81:625
15. The radius of the 5th orbit of hydrogen atom is 13.25 \AA . Calculate the wavelength of the electron in the 5th orbit.
 (a) 16.63 \AA (b) 0.53 \AA (c) 13.6 \AA (d) 6.626 \AA

ANSWER ANY SIX QUESTIONS :QUESTION NO. 24 COMPULSORY: 6X2=12

16. State Ampere's circuital law.
 17. What is photoelectric effect?
 18. Explain the reason for the glittering of diamond.
 19. Give any two examples for "Nano in nature"
 20. What is Peltier effect?
 21. Define impact parameter.
 22. What is meant by magnetic induction?
 23. A parallel plate capacitor has square plates of side 5 cm and separated by a distance of 1 mm. Calculate the capacitance of this capacitor.
 24. Calculate the power of the lens of the spectacles necessary to rectify the defect of nearsightedness for a person who could see clearly only up to a distance of 1.8 m.

ANSWER ANY SIX QUESTIONS: QUESTION NO. 33 COMPULSORY: 6X3=18

25. How will you induce an emf by changing the area enclosed by the coil?
 26. Discuss about astronomical telescope.
 27. Explain the variation of average binding energy with the mass Number by graph and discuss its features
 28. Write down the properties of electromagnetic waves.
 29. List out the advantages and limitations of frequency modulation.
 30. Explain the determination of the internal resistance of a cell Using voltmeter
 31. Obtain the expression for capacitance for a parallel plate capacitor.
 32. The horizontal component and vertical component of Earth's magnetic field at a place are 0.15 G and 0.26 G respectively. Calculate the angle of dip and resultant magnetic field. (G-gauss, cgs unit for magnetic field $1\text{G} = 10^{-4}\text{T}$)
 33. UV light of wavelength 1800 \AA is incident on a lithium surface whose threshold wavelength 4965 \AA . Determine the maximum energy of the electron emitted.

ANSWER ALL THE QUESTIONS: 5X5=25

34. Explain the types of emission spectrum. (OR)
 Discuss diffraction at single slit and obtain the condition for n^{th} minimum.
 35. Describe the Fizeau's method to determine speed of light. (OR)
 Derive the expression for the force on a current-carrying conductor in a magnetic field.
 36. Obtain the expression for electric field due to an infinitely long charged wire. (OR)
 What do you mean by electron emission? Explain briefly various methods of electron emission.
 37. Describe the microscopic model of current and obtain general form of Ohm's law. (OR)
 Transistor functions as a switch Explain.
 38. Explain the working of a single-phase AC generator with Necessary diagram. (OR)
 Describe the working of nuclear reactor with a block diagram.