

Roll No. of Candidate : _____

PHYSICS

Intermediate Part-II , Class 12th (1stA 424 - I) Paper: II Group – II

Time: 20 Minutes

OBJECTIVE Code: 8472

Marks: 17

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

1. The capacity of condenser is 4×10^{-6} Farad and its potential is 100 Volt. The energy released on discharging it fully will be
(A) 0.02 J (B) 0.04 J (C) 0.025 J (D) 0.05 J
2. Two metallic spheres of radius 1cm and 2cm get equal quantity of charge. Which has greater surface charge density?
(A) 1st sphere (B) 2nd sphere (C) both get equal surface (D) none of these
3. If the length of conductor is doubled and its cross sectional area is halved, its conductance will be
(A) increased four times (B) become one fourth
(C) become one-half (D) remained un-changed
4. For a current carrying solenoid the term "n" has unit as
(A) no unit (B) m (C) m^{-1} (D) m^{-2}
5. Force on a current carrying conductor per unit length is given by
(A) $IL \sin\theta$ (B) ILB (C) IB (D) $IB \sin\theta$
6. The induced emf is primarily produced at the cost of
(A) internal energy (B) mechanical energy (C) chemical energy (D) electrical energy
7. The emf induced in 1mH inductor in which current changes from 5A to 3A in 1s is
(A) $2 \times 10^{-6}V$ (B) $8 \times 10^{-6}V$ (C) 2V (D) 8V
8. The reactance of an inductor at 50Hz is 10Ω . Its reactance at 100Hz is
(A) 2.5Ω (B) 5Ω (C) 10Ω (D) 20Ω
9. When applied potential difference is increased; capacitance of parallel plate capacitor
(A) increases (B) decreases (C) remains same (D) reduces to zero
10. If a wire is stretched to double of its length then strain will be
(A) zero (B) 1 (C) $1/2$ (D) double
11. The term transistor stands for
(A) transfer of resistance (B) transfer of voltage
(C) transfer of current (D) all of these
12. The voltage gain of an amplifier having $r_{ie} = 1\Omega$, $\beta = 100$, $R_c = 20\Omega$ is
(A) 2000 (B) 1000 (C) 500 (D) 5
13. In photoelectric effect the intensity of light made twice than initial value. The maximum K.E of photoelectron becomes
(A) same (B) double (C) half (D) four times
14. Threshold wavelength for metal having work function 40 is λ_0 . What is the threshold wavelength for metal having work function 240 is
(A) 2λ (B) 4λ (C) $\lambda/2$ (D) $\lambda/4$
15. Using spectroscopy the helium was identified in the
(A) Earth (B) Sun (C) Stars (D) all of these
16. Unit of decay constant λ is
(A) ms (B) m^{-1} (C) m (D) s^{-1}
17. Circulation of blood can be studied by
(A) Sodium – 24 (B) Strontium – 90 (C) Carbon – 14 (D) Iodine – 131

Note: Section I is compulsory. Attempt any three (3) questions from Section II.

SECTION – I

2. Write short answers to any EIGHT questions. (2 x 8 = 16)

- Suppose you follow an electric field line due to a positive point charge. Do electric field and the potential increase or decrease.
- Describe the force or forces on a positive point charge when placed between parallel plates.
a) with similar and equal charges b) with opposite and equal charges
- State Gauss's Law. Write down its mathematical form.
- Define dielectric constant. Give its mathematical form.
- Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate? Explain.
- Why the voltmeter should have a very high resistance.
- A sensitive galvanometer cannot be stable. Why?
- What should be the orientation of current carrying coil in a magnetic field so that torque acting on it is
a) maximum b) minimum
- If a nucleus has a half life of 1 year, does this mean that it will be completely decayed after 2 years? Explain.
- What fraction of a radioactive sample decays after two half lives have elapsed?
- What are baryons and mesons? How are they formed?
- Describe principle and working of Mass Spectrograph.

3. Write short answers to any EIGHT questions. (2 x 8 = 16)

- Describe a circuit which will give continuously varying potential.
- Explain why the terminal potential difference of a battery decreases when the current drawn from it is increased.
- Distinguish between resistance and resistivity. Give units.
- How does doubling the frequency effect the resistance of an (a) Inductor (b) Capacitor
- What is meant by A.M and F.M?
- Give four characteristics of series resonance circuit.
- What are Para and ferromagnetic substances? Give example.
- What is meant by Hysteresis loss? How is it used in the construction of a transformer?
- What are applications of Superconductors?
- Why ordinary silicon diodes do not emit light?
- Why a photodiode is operated in reverse biased state?
- What are the characteristics of operation amplifier?

4. Write short answers to any SIX questions. (2 x 6 = 12)

- Does the induced emf always act to decrease the magnetic flux through a circuit?
- How would you position a flat loop of wire in a changing magnetic field so that there is no emf induced in the loop?
- How the "Eddy Currents" are produced? What are their effects on the efficiency of a transformer?
- As a solid is heated and begins to glow, why does it first appear red?

(Turn Over)

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- Can pair production take place in vacuum? Explain.
- Find the relativistic mass of an object moving with speed $0.8C$, where ' C ' is the speed of light.
- Write down at least four applications of a photocell.
- What are the advantages of laser over ordinary light?
- Write down any two postulates of Bohr's theory of Hydrogen atom.

SECTION – II

- (a) Find the charge on an electron by Millikan's method. (5)

(b) A rectangular bar of iron is 2.0cm by 2.0cm in cross-section and 40cm long. Calculate the resistance, if the resistivity of iron is $11 \times 10^{-8} \Omega m$ (3)
- (a) Discuss the principle, construction and working of a Galvanometer. (5)

(b) A square coil of side 16cm has 200 turns and rotates in a uniform magnetic field of magnitude 0.05T. If the peak emf is 12V, what is the angular velocity of the coil? (3)
- (a) Discuss the flow of A.C. through a capacitor. Explain phase relationship between current and voltage graphically and also vectorially. (5)

(b) The current flowing into the base of a transistor is $100 \mu A$. Find its collector current I_C , its emitter current I_E and the ratio I_C/I_E if the value of current gain β is 100. (3)
- (a) Define strain energy. Derive its relation for an elastically deformed wire in terms of modulus of elasticity. (5)

(b) What is the de-Broglie wavelength of an electron whose Kinetic Energy is 120eV? (3)
- (a) Explain the phenomenon of nuclear transmutation or radioactive decay. (5)

(b) The wavelength of K x-ray from copper is $1.377 \times 10^{-10} m$. What is the energy difference between the two levels from which transition results? (3)

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