

Roll No. of Candidate : _____

PHYSICS

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

Time: 20 Minutes

OBJECTIVE Code: 8477 GUF-1-24

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. Which of the following circuit is called electrical oscillator?
(A) R.L circuit (B) R.C circuit (C) R.L.C circuit (D) L.C circuit
2. A charged particle enters in a strong magnetic field, then its K.E
(A) remains constant (B) increases
(C) decreases (D) first increases then decreases
3. Turn ratio of a transformer is 50. If 220 volt A.C is applied to its primary coil, voltage in the secondary coil will be
(A) 440 V (B) 4.4 V (C) 220 V (D) 11000 V
4. The physical quantity related to photon, that does not change in Compton scattering is
(A) energy (B) speed (C) frequency (D) wavelength
5. In photoelectric effect, the number of photoelectrons depends upon
(A) wavelength of light (B) intensity of light
(C) threshold frequency (D) work function
6. Glass is also known as
(A) solid (B) liquid (C) solid liquid (D) gas
7. The unit of electric intensity other than NC^{-1} is
(A) V/A (B) V/m (C) V/C (D) N/V
8. The unit of \vec{E} is NC^{-1} and that of \vec{B} is $NA^{-1}m^{-1}$, then the unit of E/B is
(A) ms^{-2} (B) ms (C) $m^{-1}s^{-1}$ (D) ms^{-1}
9. The binding energy per nucleon is maximum for
(A) Helium (B) Iron (C) Polonium (D) Radium
10. For holography, we use a beam of
(A) r – rays (B) x – rays (C) β – rays (D) Laser
11. The colour of light emitted by LED depends on
(A) its forward biasing (B) the reverse biasing
(C) amount of forward current (D) type of semi-conductor material used
12. When current flowing through an inductor is doubled, the energy stored in it becomes
(A) half (B) four times (C) one fourth (D) double
13. The half-life of Radon gas is
(A) 3.8 days (B) 38 days (C) 3.8 months (D) 38 months
14. An ideal voltmeter would have
(A) zero resistance (B) high resistance (C) infinite resistance (D) low resistance
15. A parallel plate capacitor with oil having $\epsilon_r = 2$ has a capacitance C. If the oil is removed between the plates, then capacitance of capacitor becomes
(A) C (B) C/2 (C) $C/\sqrt{2}$ (D) 2C
16. The voltage gain of an amplifier having $r_{ie} = 1 \Omega$, $\beta = 100$ and $R_c = 20 \Omega$ is
(A) 2000 (B) 1000 (C) 500 (D) 5
17. When we accelerate the charge, which type of waves are produced?
(A) Mechanical waves (B) Travelling waves
(C) Stationary waves (D) Electromagnetic waves

PHYSICS

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

Group - I

Time: 2:40 Hours

SUBJECTIVE

GUJ-1-24

Marks: 68

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)

- i. Define electric field intensity. Also give its mathematical form.
- ii. Define electron volt? Relate electron volt with Joule.
- iii. The time constant of a series RC circuit is, $t = RC$. Verify that an Ohm times Farad is equal to Second.
- iv. Why the resistance of an ammeter should be very low?
- v. Electric lines of force never cross. Why?
- vi. How can you use a magnetic field to separate isotopes of chemical elements?
- vii. What do you mean by lamp-scale arrangement?
- viii. What is Lorentz force?
- ix. A particle which produces more ionization is less penetrating. Why?
- x. How can radioactivity help in the treatment of Cancer?
- xi. Differentiate between nuclear fission and nuclear fusion.
- xii. Define isotopes. Write down isotopes of Hydrogen atom.

3. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- i. Describe a circuit which will give a continuously varying potential.
- ii. What is the difference between the emf and potential difference?
- iii. What is the temperature co-efficient of resistance?
- iv. How the reception of a particular radio station is selected on your radio set?
- v. What is the principle of metal detector?
- vi. Why power loss in a pure capacitance circuit is zero?
- vii. What is meant by hysteresis loss? How it is used in the construction of a transformer?
- viii. What is meant by Retativity and Coercivity?
- ix. How can you identify tumors and inflamed tissues using 'MRI'?
- x. Why is the base current in a transistor very small?
- xi. Explain OP-AMP as a comparator.
- xii. What is the voltage gain of transistor?

4. Write short answers to any SIX questions.

(2 x 6 = 12)

- i. Name the factors upon which the self-inductance depends.
- ii. Write down the methods to improve the efficiency of a transformer.
- iii. Can a D.C. motor be turned into a D.C. generator? What changes are required to be done?

(Turn Over)

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- iv. Define work function and threshold frequency.
- v. Calculate the value of Compton wavelength of electron.
- vi. We do not notice a de-Broglie wavelength for a pitched cricket ball. Explain why?
- vii. When does light behave as a wave and when does it behave as a particle?
- viii. Describe the types of spectra and give its example.
- ix. What are advantages of laser over ordinary light?

SECTION - II.

- 5. (a) How did Millikan calculate the charge on an electron? Explain (5)
(b) A rectangular bar of iron is 2.0cm by 2.0cm in cross section and 40cm long. Calculate its resistance if the resistivity of iron is $11 \times 10^{-8} \Omega m$ (3)
- 6. (a) Define galvanometer. Explain its principle, construction and working. (5)
(b) The back emf in a motor is 120V when the motor is turning at 1680 rev per min. What is the back emf when the motor turns 3360 rev per min? (3)
- 7. (a) Explain Reverse Biased p-n junction and describe how depletion region increases due to Reverse Biased of p-n junction. (5)
(b) Find the value of the current flowing through a capacitor of capacitance $0.5 \mu F$, when connected to a source of 150V at 50Hz. (3)
- 8. (a) State and explain photoelectric effect. Write down its experimental results. (5)
(b) The length of a steel wire is 1m and its cross-sectional area is $0.03 \times 10^{-4} m^2$. Calculate the work done in stretching the wire when a force of 100N is applied within the elastic region. Young's modulus of steel is $3.0 \times 10^{11} Nm^{-2}$. (3)
- 9. (a) Derive the expression for Quantized Energy of Hydrogen atom on the basis of Bohr's atomic model. (5)
(b) How much energy is absorbed by a man of mass 80Kg who receives a lethal whole body dose of 400 rem in the form of low energy neutrons for which RBE factor is 10? (3)

No. of Candidate : _____

PHYSICS

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

Time: 20 Minutes

OBJECTIVE Code: 8476

GRJ-2-24

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. Using spectroscopy the helium was identified in the
(A) Earth (B) Sun (C) Stars (D) all of these
2. The induced emf is primarily produced at the cost of
(A) internal energy (B) mechanical energy (C) chemical energy (D) electrical energy
3. The reactance of an inductor at 50Hz is 10Ω . Its reactance at 100Hz is
(A) 2.5Ω (B) 5Ω (C) 10Ω (D) 20Ω
4. 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) $\lambda/4$
5. The emf induced in 1mH inductor in which current changes from 5A to 3A in 1s is
(A) $2 \times 10^{-6}\text{V}$ (B) $8 \times 10^{-6}\text{V}$ (C) 2V (D) 8V
6. 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
7. 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
8. 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
9. 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) 0.02J (B) 0.04J (C) 0.025J (D) 0.05J
10. Circulation of blood can be studied by
(A) Sodium - 24 (B) Strontium - 90 (C) Carbon - 14 (D) Iodine - 131
11. If a wire is stretched to double of its length then strain will be
(A) zero (B) 1 (C) $1/2$ (D) double
12. Unit of decay constant λ is
(A) ms (B) m^{-1} (C) m (D) s^{-1}
13. The term transistor stands for
(A) transfer of resistance (B) transfer of voltage
(C) transfer of current (D) all of these
14. Force on a current carrying conductor per unit length is given by
(A) $IL \sin\theta$ (B) ILB (C) IB (D) $IB \sin\theta$
15. For a current carrying solenoid the term "n" has unit as
(A) no unit (B) m (C) m^{-1} (D) m^{-2}
16. When applied potential difference is increased; capacitance of parallel plate capacitor
(A) increases (B) decreases (C) remains same (D) reduces to zero
17. 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

ACS

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

Group - II

me: 2:40 Hours

SUBJECTIVE

GUT-2-24

Marks: 68

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)

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

(2 x 8 = 16)

3. Write short answers to any EIGHT questions.

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

(2 x 6 = 12)

4. Write short answers to any SIX questions.

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

(Turn Over)

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

SECTION – II

- 5. (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)
- 6. (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)
- 7. (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)
- 8. (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)
- 9. (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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