

Sign. Dy. Supdnt.

Fictitious Roll No. (For Office Use)

Sign. Candidate

PHYSICS (GROUP -I)

21/01

(Smart Syllabus)

(PART -II)

(INTERMEDIATE)

Marks : 17

(OBJECTIVE PART)

(****)

Time : 20 Minutes

Note:- Write your Roll No. in space provided. Over writing, cutting, using of lead pencil will result in loss of marks. All questions are to be attempted.

1- Each question has four possible answers, Tick (\checkmark) the correct answer. (17)

1	Compton shift in wave length ($\Delta\lambda$) is zero, when the scattered angle of photon is;							
	A	0°	B	45°	C	90°	D	180°
2	The number of photo electrons depends upon;							
	A	Wave length of light	B	Intensity of light	C	Threshold frequency	D	Work function
3	Production of x-rays can be regarded as the inverse of;							
	A	Compton effect	B	Pair production	C	Photo-electric effect	D	Annihilation of matter
4	Curie is the unit of;							
	A	Conductivity	B	Resistivity	C	Radio activity	D	Radio graphy
5	The mass of β -Particle is equal to mass of;							
	A	Proton	B	Electron	C	Neutron	D	Photon
6	A capacitor stores energy in the form of;							
	A	Magnetic field	B	Heat energy	C	Electrical energy	D	Mechanical energy
7	The smallest possible charge which a particle can have is;							
	A	$1.6 \times 10^{-19} \text{ C}$	B	$2.4 \times 10^{-19} \text{ C}$	C	$2 \times 10^{-19} \text{ C}$	D	$3 \times 10^{-19} \text{ C}$
8	Drift velocity of electrons is of the order of;							
	A	10 ms^{-1}	B	10^{-2} ms^{-1}	C	10^{-3} ms^{-1}	D	10^{-4} ms^{-1}
9	The force F in the equation $F=F_e+F_m$ is called;							
	A	Lorentz Force	B	Restoring Force	C	Frictional Force	D	Gravitation Force
10	The brightness of spot on CRO screen is controlled by;							
	A	Anodes	B	Cathodes	C	Grid	D	Plates
11	Energy stored per unit volume inside a solenoid is called as;							
	A	Energy density	B	Electric flux	C	Work	D	Volume charge density
12	The S.I unit of mutual inductance is "Henry" which is;							
	A	VsA^{-1}	B	Vs^{-1}A	C	$\text{Vs}^{-1}\text{A}^{-1}$	D	VsA
13	For R-L Series Circuit, the voltage leads the current by phase angle of;							
	A	$\tan^{-1}\left(\frac{\omega C}{R}\right)$	B	$\tan^{-1}\left(\frac{1}{\omega CR}\right)$	C	$\tan^{-1}\left(\frac{\omega L}{R}\right)$	D	$\tan^{-1}\left(\frac{\omega}{RC}\right)$
14	S.I unit of stress is same as that of;							
	A	Momentum	B	Pressure	C	Force	D	Length
15	The photo diodes are used for;							
	A	Security system	B	Counting System	C	Automatic door system	D	All of these
16	Open loop gain of op-amp is of the order of							
	A	10^4	B	10^5	C	10^6	D	10^7
17	The gain of transistor amplifier depends upon;							
	A	Resistance connected with collector	B	Resistance connected at base	C	Input voltage	D	Output voltage

(The End)

Note:- Attempt any TWENTY TWO (22) short questions in all selecting eight from Q. 2 and Q. 3 each and six from Q. 4.

ATK-21
SECTION – I

(22 x 2 = 44)

2- Write short answers of any eight parts. (2 x 8 = 16)

i	Define potential gradient and give its SI Units.	ii	What is dielectric co-efficient write it in mathematical form.
iii	Describe the force or forces on a positive point charge when placed between parallel plates. i. With similar and equal charges. ii. With opposite and equal charges.	iv	Suppose that a charge q is moving in a uniform magnetic field with a velocity v, why is there no work done by the magnetic force that acts on the charge.
v	Differentiate between magnetic flux and flux density.	vi	Write any two characteristics of electric field lines.
vii	How can you use a magnetic field to separate isotopes of chemical element?	viii	Write uses of CRO.
ix	State Faraday's Law and write its mathematical form.	x	Does the induced emf always act to decrease the magnetic flux through a circuit?
xi	Is it possible to change both the area of the loop and the magnetic field passing through loop and still not have an induced emf in the loop?	xii	Define self induction. Write its formula and SI Unit.

3- Write short answers of any eight parts. (2 x 8 = 16)

i	Why does the resistance of a conductor rise with temperature?	ii	Explain why the terminal potential difference of a battery decreases when the current drawn from it is increased.
iii	Define temperature coefficient of resistance and write its formula.	iv	Write four properties of parallel resonance circuit.
v	A sinusoidal current has rms value of 10A. What is the maximum or peak value?	vi	How many times per second will an incandescent Lamp reach maximum brilliance? When connected to a 50Hz source.
vii	What are ductile substances give its two examples.	viii	Distinguish between intrinsic and extrinsic semi conductor.
ix	Define modulus of elasticity. Show that the unit of modulus of elasticity and stress are the same.	x	Why a photo diode is operated in a reverse biased state.
xi	Why charge carriers are not present in the depletion region?	xii	What is photo diode? Write down its any two applications.

4- Write short answers of any six parts. (2 x 6 = 12)

i	Show that as the temperature of a material is increased, the emitted radiation becomes richer in shorter wavelengths.	ii	Which has lower energy quanta? Radio waves or X-rays?
iii	We do not notice the de Broglie wavelength for a pitched cricket ball. Explain why?	iv	How X-rays cause damage to living tissues?
v	What are the advantages of laser over ordinary light?	vi	Discuss the emission of γ -radiation from a radioactive nucleus in short.
vii	How a stable element can be made radioactive?	viii	What information is revealed by the length and shape of the tracks of an incident particle in Wilson cloud chamber?
ix	What factors make a fusion reaction difficult to achieve?		

SECTION – II

Note:- Attempt any three questions. (8 x 3 = 24)

5	a	State the Kirchhoff's rules and explain Kirchhoff's voltage rule.	(05)
	b	A particle having a charge of 20 electrons on it falls through a potential difference of 100 volts. Calculate the energy acquired by it in electron volts (ev).	(03)
6	a	State only Ampere's law and apply to find the magnetic field due to a current carrying solenoid?	(05)
	b	A square coil of side 10cm has 200 turns and rotates in a uniform magnetic field of magnitude 0.05T. If peak emf is 12V, What is angular velocity of the coil?	(03)
7	a	How the comparator can be used as night switch?	(05)
	b	What is the resonance frequency of a circuit which includes a coil of inductance 2.5H and a capacitance $40\mu F$?	(03)
8	a	What is fission chain reaction? Describe controlled and uncontrolled chain reactions?	(05)
	b	A 1.25cm diameter cylinder is subjected to a load of 2500kg. Calculate the stress on the bar in mega pascals.	(03)
9	a	What is LASER? Explain Helium – Neon laser. Write its four uses.	(05)
	b	X-rays of wavelength 22pm are scattered from a carbon target. The scattered radiations being viewed at 85° to the incident beam. What is Compton shift?	(03)