Physics	(B)	L.K.No. 1069	Paper Code No. 8473
Paper II	(Objective Type)	Ist – A – Exam 2023	Group Ist
Time :	20 Minutes	Inter (Part - II)	
Marks :	17	Session (2019 – 21) to (2021 – 23)	

Note : Four possible choices A , B , C ,D to each question are given. Which choice is correct fill that circle in front of that Question No. Use Marker or Pen to fill the circles. Cutting or filling two or more circles will result in Zero Mark in that Question.

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Q.No.1 (1)	Half Life of Uranium – 239 is : (A) 26 . 5 Minutes (B) 23 . 5 Minutes (C) 24 . 5 Minutes (D) 25 . 5 Minutes
(2)	The Number of Neutrons in $^{238}_{92}U$ is : (A) 92 (B) 238 (C) 146 (D) 330
(3)	For Paschen Series , the value of ' n ' starts from : (A) 2 (B) 8 (C) 6 (D) 4
(4)	1 Kg Mass will be equivalent to energy : (A) 9×10^{8} J (B) 9×10^{16} J (C) 9×10^{12} J (D) 9×10^{19} J
(5)	Mathematical Treatment for Electromagnetic Waves was given by : (A) Faraday (B) *Maxwell* (C) *Hertz* (D) *Coulomb*
(6)	In forward biasing a p – n junction ideal, offers : (A) High Resistance (B) Infinite Resistance (C) Low Resistance (D) Medium Resistance
(7)	Which One is not a Donor Impurity here : (A) Antimony (B) Phosphorus (C) Aluminium (D) Arsenic
(8)	Which One is not Crystalline Solid : (A) Zinc (B) Copper (C) Nylon (D) Zirconia
(9)	The graph between time and A.C. Voltage is known as : (A) Parabola (B) Tangent Curve (C) Sine Curve (D) Straight Line
(10)	The Peak Value of A.C. Source is 20 A , then its rms value will be : (A) 20 A (B) 10 A (C) 14 . 1 A (D) 28 . 2 A
(11)	Inductance is measured in : (A) Ohm (B) Volts (C) Henry (D) Weber
(12)	The Mutual Inductance of Coils depends on : (A) Stiffness (B) Density (C) Nature of Material (D) Geometry
(13)	The relation between Tesla and smaller unit Gauss of Magnetic Induction is given by : (A) $1\,T = 10^{3}\,G$ (B) $1\,T = 10^{6}\,G$ (C) $1\,T = 10^{2}\,G$ (D) $1\,T = 10^{4}\,G$
(14)	The most suitable material for making magnet is : (A) Soft Iron (B) Copper (C) Gold (D) Silver
(15)	One Coulomb per second is equal to : (A) One Volt (B) One Ampere (C) One Watt (D) One Ohm
(16)	If the distance between two point charges is halved , the Electric Intensity becomes : (A) Half (B) ¼ Times (C) 4 Times (D) Double
(17)	Relative Permitivity for air is : (A) 1 . 06 (B) 1 . 006 (C) 1 . 0006 (D) 1 . 6

Roll No.	1069 - 2 / 000	Inter (Part II)	Group Ist
Physics (Subjective)	Ist – A – Exam 2023	Time 2 : 40 Hours Marks : 68	Session (2019 –21) to (2021 – 23)

Note : It is compulsory to attempt any (8 – 8) Parts each from Q.No. 2 and Q.No.3 and attempt any (6) Parts from Q.No.4. Attempt any (3) Questions from Part – II .Write same Question No. and its Part No. as given in the Question Paper.

Make Diagram where necessary.

Part - I

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22 x 2 = 44

Q.No.2	(i)	Do Electrons tend to go to region of High Potential or of Low Potential ?
	(ii)	Is $\vec{E}$ necessarily Zero inside a charged rubber balloon if balloon is spherical ? Assume that charge is distributed uniformly over the surface .
	(iii)	How charged particle work during their flight in inkjet printer ?
	(iv)	What is Potential Gradient ? Give its units.
	(v)	Why the Resistance of an Ammeter should be very low ?
	(vi)	If a charged particle moves in a straight line through some region of space , can you say magnetic field in this region is zero ?
	(vii)	How you express Magnetic Flux ? On what factor it depends ?
	(viii)	How we can increase the range of Voltmeter ?
	(ix)	What do we mean by the term Critical Mass ?
	(x)	What do you understand by " Background Radiation" ? State two sources of Radiation.
	(xi)	What do you mean by Quark ?
	(xii)	What is Radiography ? What is its importance ?
Q.No.3	(i)	Why does the Resistance of a conductor rise with temperature ?
	(ii)	Do bends in a wire affect its Electric Resistance ? Explain.
	(iii)	Name any four sources of Current .
	(iv)	Explain the conditions under which Electromagnetic Waves are produced from a source .
	(v)	How many times per second will an Incandescent Lamp reach maximum brilliance when connected to a 50 Hz source ?
	(vi)	What do you mean by Root Mean Square Value (rms) ?
	(vii)	Differentiate between Crystalline Amorphous and Polymeric Solids ?
	(viii)	What is meant by Para , Dia and Ferromagnetic Substance ? Give example of each.
	(ix)	Explain what is Curie Temperature ?
	(x)	Why a Photodiode is operated in reverse biased state ?
	(xi)	What is the Net Charge on a n – type or p – type substance ?
	(xii)	The input of a gate are ' 1 ' and ' 0 ' . Identify the gate if its output is : (a) 0 (b) 1
Q.No.4	(i)	What does Negative Sign in Equation of Faraday's Law indicate ?
	(ii)	Define the SI Unit of Mutual Inductance Henry.
	(iii)	Can a D.C. Motor be turned into a D.C. Generator? What changes are required to be done ?
	(iv)	Which Photon red , green or blue carries the most : (a) Energy and (b) Momentum ?
	(v)	Which has the Lower Energy Quanta Radiowaves or X – rays ?
	(vi)	From theory of Relativity, derive the expression of Momentum of Photon.
	(vii)	What is Energy of a Photon in a beam of Infrared Radiation of Wavelength 1240 nm ?
	(viii)	What do we mean when we say that the atom is excited ?
	(ix)	Differentiate between Spontaneous Emission and Induced or Stimulated Emission.

Part - II

3 x 8 = 24

Q.No.5	(a)	State and Explain Coulomb's Law.	(5)
	(b)	1.0×10^{7} Electrons pass through a conductor in 1.0 . Find the current in Ampere flowing through the conductor. Electric Charge is 1.6×10^{-19} C .	(3)
Q.No.6	(a)	What is Motional emf ? Derive an expression for it .	(5)
	(b)	What current should pass through a Solenoid that is 0.5 m long with 10,000 turns of Copper so that is will have a magnetic field 0.4 T ?	(3)
Q.No.7	(a)	How Transistor can be used as Amplifier ? Explain with Circuit and derive expression for voltage gain.	(5)
	(b)	What is the Resonant Frequency of a Circuit which includes a coil of Inductance 2.5 H and a Capacitance 40 μF ?	(3)
Q.No.8	(a)	Describe the Wave Nature of Particle. Also discuss Davisson and Germer Experiment.	(5)
	(b)	A 1.25 cm diameter cylinder is subjected to a load of 2500 Kg. Calculate the stress on the bar in Mega Pascals.	(3)
Q.No.9	(a)	What is Spectroscopy ? Derive the expression that in Bohr's Atomic Model of Hydrogen Atom , Bohr's Orbital Energies are Quantized.	(5)
	(b)	How much energy is absorbed by a man of mass 80 Kg who receives a lethal whole body equivalent dose of 400 rem in the form of low energy Neutrons for which RBE factor is 10 ?	(3)