Physics	(C)	L.K.No. 1463	Paper Code No. 8475
Paper II	(Objective Type)	Inter (Ist – A – Exam – 2024)	
Time :	20 Minutes	Inter (Part – II)	(Group Ist)
Marks :	17	Session (2020 – 22) to (2022 – 24)	

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

Q.No.1 (1)	A wire of resistance 9 Ohm is cut into three equal parts and these are connected in parallel. The Equivalent Resistance is : (A) 1 Ohm (B) 3 Ohm (C) 9 Ohm (D) 27 Ohm
(2)	By Introducing a Dielectric between the plates of a Charged Capacitor , energy stored will be : (A) Increased (B) Decreased (C) Remain Constant (D) Nothing Can Be Said
(3)	Force between two point charges 10 μC and 40 μC is 9000 N. Then distance between them is : (A) 2 cm (B) 20 cm (C) 20 m (D) 400 m
(4)	In case of Torque on a Current carrying coil , ' α ' is angle between : (A) $\bar{B}$ and $\bar{A}$ (B) Pole faces and Plane of Coil (C) $\bar{B}$ and Plane of Coil (D) None of these
(5)	A Transformer consists of 500 turns in Primary and 200 turns in Secondary . When a battery of emf 9V is connected at the Primary , The Voltage obtained at Secondary is : (A) 3 . 6 V (B) 22 . 4 V (C) 9 V (D) Zero Volt
(6)	A steady current of 1 A in a coil of 1000 turns generates a flux of 10^{-4} Wb to pass through the loop of the coil. The energy stored in the inductor is : (A) 5 J (B) 0 . 05 J (C) 0 . 5 J (D) 50 J
(7)	The restoring couple in moving coil Galvanometer is due to : (A) Current in the coil (B) Magnetic Field (C) Material of Coil (D) Twist in Wire
(8)	A parallel resonance circuit has resonance frequency ' f ' . If Capacitance of this circuit is increased four times , then resonance frequency becomes : (A) 2 f (B) 4 f (C) f /4 (D) f/2
(9)	The phase difference between input voltage and output voltage of the Transistor Amplifier is : (A) 0^{o} (B) 90^{o} (C) 180^{o} (D) 120^{o}
(10)	In Hysteresis Loop, lagging of magnetism behind magnetizing current is called : (A) Saturation (B) Retentivity (C) Hysteresis (D) Coercivity
(11)	Power factor is 1 for : (A) Pure Inductor (B) Pure Capacitor (C) Pure Resistor (D) Both Capacitor and Inductor
(12)	A Transistor has a base current of 1mA and emitter current 100 mA . The current gain of the transistor is : (A) 1 (B) 99 (C) 100 (D) 101
(13)	In laser , the excited atom returns to its ground state from its meta stable state is about : (A) 10^{-10} s (B) 10^{-8} s (C) 10^{-5} s (D) 10^{-3} s
(14)	Which of the following detectors can count fast and operate at low voltage : (A) Geiger Counter (B) Wilson Cloud Chamber (C) Solid State Detector (D) Scintillation Counter
(15)	The momentum of a Photon of frequency ' f ' is : (A) hc / f (B) c / hf (C) f / hc (D) hf / c
(16)	In a Nuclear Reactor , Cadmium rods are used to : (A) Speed Up Electrons (B) Slow Down Neutrons (C) Absorb Neutrons (D) Produce Neutrons
(17)	The de-Broglie wavelength of a particle of mass ' m ' moving with Kinetic energy ' E ' is : (A) $\sqrt{h/2mE}$ (B) $h/\sqrt{2mE}$ (C) h / 2mE (D) $\sqrt{h}$ / 2mE

Roll No.	1463 - 20,000	Inter (Part – II)	Session (2020 –22) to (2022 – 24)
Physics (Subjective)	Inter (Ist – A– Exam – 2024)	Group Ist	Time 2 : 40 Hours Marks : 68

Note : It is compulsory to attempt any (8 – 8) Parts each from Q.No. 2, Q.No.3 and attempt any (6) Parts from Q.No.4. Attempt any (3) Questions from Part – II .Write the Same Question Number and its Part Number as given in the Question Paper BWP-1-24

Make Diagram where necessary. | Part - I | 22 x 2 = 44

Q.No.2	(i)	The Potential is constant throughout a given region of space. Is the Electric Field zero or non-zero in this region ? Explain.
	(ii)	Electric lines of force never cross. Why?
	(iii)	Differentiate between Electric Field and Electric Field Intensity .
	(iv)	What are the properties of Electric Field Lines?
	(v)	How can a Current Loop be used to determine the presence of a Magnetic Field in a given region of space?
	(vi)	Why the Resistance of an Ammeter should be very low?
	(vii)	What are the uses of CRO?
	(viii)	What is Lorentz Force? Give its Mathematical expression.
	(ix)	A Particle which produces more Ionization is less penetrating. Why?
	(x)	What is meant by Critical Mass?
	(xi)	Distinguish between Nuclear Fission and Nuclear Fusion.
	(xii)	What is meant by Radiography?
Q.No.3	(i)	Is the Filament Resistance lower or higher in a 500 W , 220 V light bulb than in a 100 W , 220 V bulb ?
	(ii)	A wire of Resistivity ρ is stretched to twice of its length . What will be the new Resistivity?
	(iii)	Define Tolerance . Give one example.
	(iv)	How many times per second will an Incandescent Lamp reach maximum brilliance when connected to a 50 Hz source?
	(v)	Write any three characteristics of Series Resonance Circuit.
	(vi)	What is the main reason for the world wide use of A.C ?
	(vii)	Distinguish between Crystalline and Amorphous Solids.
	(viii)	What is meant by Para , Dia and Ferromagnetic Substances? Give examples for each.
	(ix)	Define UTS and Plasticity.
	(x)	What is the Net Charge on a n – type or a p – type substance?
	(xi)	Why a Photodiode is operated in Reverse Biased State?
	(xii)	A Transistor has I_C = 10 mA and I_B = 40 μA , calculate the Current gain.
Q.No.4	(i)	What are the factors due to which induced emf can be increased ?
	(ii)	The turns Ratio of a Step up Transformer is 50 . Find the number of turns in Secondary Coil , if the number of turns in Primary Coil is 10.
	(iii)	Four Unmarked wires emerge from a Transformer. What steps would you take to determine the Turns Ratio ?
	(iv)	The life time of an electron in an excited state is about 10^{-8} s. What is its Uncertainty in energy during this time?
	(v)	As a Solid is heated and begins to glow , why does it first appear red?
	(vi)	What happens to total radiation from a black body if its absolute temperature is doubled?
	(vii)	What is NAVSTAR Navigation System?
	(viii)	Write down the Biological Effects of X-Rays.
	(ix)	Explain why Laser action could not occur without Population Inversion between Atomic levels?

B

P.T.O.

.1463	(Part – II)	3 x 8 = 24

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.o.5	(a)	What is Wheatstone Bridge? How it can be used to find the unknown resistance?	(5)
	(b)	Two Point Charges $q_1 = -1.0 \times 10^{-6}$ C and $q_2 = +4.0 \times 10^{-6}$ C, are separated by a distance of 3.0 m. Find and justify the zero – field location.	(3)
Q.No.6	(a)	Derive the expression for energy stored in an inductor in terms of Magnetic Field. Also find the Energy Density.	(5)
	(b)	A velocity selector has a Magnetic Field of 0.30 T. If a perpendicular Electric Field of 10,000 Vm^{-1} is applied, what will be the speed of the particle that will pass through the selector?	(3)
Q.No.7	(a)	Write a note on Transistor as an Amplifier. Calculate its Voltage Gain and give significance of negative sign.	(5)
	(b)	Find the value of the current flowing through a Capacitance 0.5 μF when connected to a source of 150 V at 50 Hz.	(3)
Q.No.8	(a)	What is Hysteresis Loop ? Discuss in detail.	(5)
	(b)	The life time of an electron in an excited state is about 10^{-8} s. What is its uncertainty in energy during this time?	(3)
Q.No.9	(a)	Give the postulates of BOHR'S Atomic Model. Describe Hydrogen Emission Spectrum by using BOHR'S Atomic Model.	(5)
	(b)	A 75 kg person receives a whole body radiation dose of 24 m-rad, delivered by α-particles for which RBE factor is 12. Calculate : (a) The Absorbed Energy in Joules (b) The Equivalent dose in rem.	(3)

04-04-2024