



Physics	(C)	L.K.No. 1463	Paper Code No. 8475
Paper II	(Objective Type)	Inter (1 <sup>st</sup> - A - Exam - 2024)	
Time :	20 Minutes	Inter (Part - II)	(Group 1st)
Marks :	17	Session (2020 - 22) to (2022 - 24)	

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 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
  - 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
  - Force between two point charges  $10 \mu\text{C}$  and  $40 \mu\text{C}$  is 9000 N. Then distance between them is :  
(A) 2 cm (B) 20 cm (C) 20 m (D) 400 m
  - In case of Torque on a Current carrying coil, ' $\alpha$ ' is angle between :  
(A)  $\vec{B}$  and  $\vec{A}$  (B) Pole faces and Plane of Coil (C)  $\vec{B}$  and Plane of Coil (D) None of these
  - 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
  - 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
  - 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
  - A parallel resonance circuit has resonance frequency ' $f$ '. If Capacitance of this circuit is increased four times, then resonance frequency becomes :  
(A)  $2f$  (B)  $4f$  (C)  $f/4$  (D)  $f/2$
  - The phase difference between input voltage and output voltage of the Transistor Amplifier is :  
(A)  $0^\circ$  (B)  $90^\circ$  (C)  $180^\circ$  (D)  $120^\circ$
  - In Hysteresis Loop, lagging of magnetism behind magnetizing current is called :  
(A) Saturation (B) Retentivity (C) Hysteresis (D) Coercivity
  - Power factor is 1 for :  
(A) Pure Inductor (B) Pure Capacitor (C) Pure Resistor (D) Both Capacitor and inductor
  - 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
  - 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
  - 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
  - The momentum of a Photon of frequency ' $f$ ' is :  
(A)  $hc/f$  (B)  $c/hf$  (C)  $f/hc$  (D)  $hf/c$
  - In a Nuclear Reactor, Cadmium rods are used to :  
(A) Speed Up Electrons (B) Slow Down Neutrons  
(C) Absorb Neutrons (D) Produce Neutrons
  - 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)  $\sqrt{h}/2mE$

B





Roll No.	1463 - 201600	Inter (Part - II)	Session (2020-22) to (2022-24)
Physics (Subjective)	Inter (1 <sup>st</sup> - A- Exam - 2024)	Group 1st	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 $\rho$ 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 $I_B = 40$ $\mu$ A , 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

BWP-1-24

Q.No.5	(a)	What is Wheatstone Bridge? How it can be used to find the unknown resistance?	(5)
	(b)	Two Point Charges $q_1 = -1.0 \times 10^{-6} \text{ C}$ and $q_2 = +4.0 \times 10^{-6} \text{ C}$ , 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 $10,000 \text{ Vm}^{-1}$ 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 $0.5 \mu\text{F}$ 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 $10^{-8} \text{ s}$ . 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 $\alpha$ -particles for which RBE factor is 12. Calculate : (a) The Absorbed Energy in Joules (b) The Equivalent dose in rem.	(3)

04-04-2024

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Physics	(A)	L.K.No.1464	Paper Code No. 8472
Paper II	( Objective Type )	Inter ( 1 <sup>st</sup> - A - Exam - 2024 )	
Time :	20 Minutes	Inter ( Part - II )	Group 2 <sup>nd</sup>
Marks :	17	Session (2020 - 22) to (2022 - 24)	

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	The SI unit of Electric Flux is :
(1)	(A) $\text{Nm}^2 \text{C}^{-1}$ (B) $\text{Nm}^{-2} \text{C}$ (C) $\text{Nm}^2 \text{C}^{-2}$ (D) $\text{Nm} \text{C}^{-2}$
(2)	The Force between two point charges in the presence of air is 80 N. When a dielectric "Germanium" of dielectric constant 16 is placed between them, the force reduces to : (A) 2N (B) 5N (C) 10N (D) 32N
(3)	The Potential Difference between the head and tail of an Electric EEL can be up to : (A) 200 V (B) 500 V (C) 600 V (D) 1000 V
(4)	The relation between Current 'I' and angle of deflection 'θ' in a moving coil Galvanometer is : (A) $I \propto \theta$ (B) $I \propto \frac{1}{\theta}$ (C) $I \propto \sin \theta$ (D) $I \propto \cos \theta$
(5)	Torque on a Current Carrying coil placed in a uniform magnetic field is minimum when angle between plane of coil and magnetic field is : (A) $0^\circ$ (B) $30^\circ$ (C) $45^\circ$ (D) $90^\circ$
(6)	When the motor is just started, the back emf is : (A) Maximum (B) Minimum (C) Almost Zero (D) Equal to Current
(7)	The Inductor Stores energy in : (A) Electric Field (B) Magnetic Field (C) Gravitational Field (D) Nuclear Field
(8)	The Slope of $q - t$ Curve at any instant of time when A.C passes through a capacitor represents : (A) Current (B) Voltage (C) Inductance (D) Capacitance
(9)	The Impedance of a parallel resonance circuit at resonance is : (A) Resistive (B) Capacitive (C) Inductive (D) Zero
(10)	Which of the following is a brittle substance : (A) Lead (B) Copper (C) Glass (D) Wrought Iron
(11)	A Photodiode can turn its current ON and OFF in : (A) Milli Seconds (B) Micro Seconds (C) Nano Seconds (D) Mega Seconds
(12)	The size of base in a transistor is of the order of : (A) $10^{-4} \text{ m}$ (B) $10^{-6} \text{ m}$ (C) $10^{-8} \text{ m}$ (D) $10^{-10} \text{ m}$
(13)	In Photoelectric Effect, the Photoelectric Current can be increased by : (A) Increasing the Frequency of Light (B) Decreasing the Frequency of Light (C) Increasing the Intensity of Light (D) Decreasing the Intensity of Light
(14)	When a platinum wire is heated, it becomes white at about : (A) $900^\circ \text{C}$ (B) $1100^\circ \text{C}$ (C) $1300^\circ \text{C}$ (D) $1600^\circ \text{C}$
(15)	$K_\alpha$ X-rays are produced due to transition of electron from : (A) K to L Shell (B) L to K Shell (C) M to K Shell (D) M to L Shell
(16)	The range of weak nuclear force is of the order of : (A) $10^{-9} \text{ m}$ (B) $10^{-10} \text{ m}$ (C) $10^{-17} \text{ m}$ (D) $10^{-15} \text{ m}$
(17)	In Karachi Nuclear Power Plant (KANUP), the moderator used is : (A) Graphite (B) Carbon (C) Heavy Water (D) Boron Rod





Roll No.	1464 - 20,000	Inter (Part - II)	Session (2020 - 22) to (2022 - 24)
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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 (03) Questions from Part - II .Write the Same Question Number and its Part Number as given in the Question Paper

RWP-2-24

Make Diagram where necessary.

Part - I

22 x 2 = 44

Q.No.2	(i)	Compare between Electric Forces and Gravitational Forces .
	(ii)	A Particle carrying a charge of $2e$ falls through a Potential Difference of $3.0 \text{ V}$ . Calculate the energy acquired by it.
	(iii)	Is it true that Gauss's Law States that the total number of lines of forces crossing any closed surface in the outward direction is proportional to the net positive charge enclosed within the surface ?
	(iv)	What is Electric Polarization of Dielectrics?
	(v)	Explain Digital Multimeter.
	(vi)	What should be the orientation of a current carrying coil in a magnetic field , so that torque acting upon the coil is : (a) Maximum (b) Minimum ?
	(vii)	Two Charged Particles are projected into a region where there is a magnetic field perpendicular to their velocities . If the charges are deflected in opposite directions , what can you say about them ?
	(viii)	What is the function of Sweep Time Base Generator in Cathode Ray Oscilloscope ?
	(ix)	Show that $1 \text{ U} = 931 \text{ MeV}$ by using the relation $E = mc^2$ .
	(x)	Define decay constant of Radioactive Element. What is its Unit?
	(xi)	Name two Processes take place at low energy and at high energy radiation.
	(xii)	Name the Particle which has high Penetrating Power . Give reason.
Q.No.3	(i)	Why some of the Electrons are free in Conductors?
	(ii)	Describe a Circuit which will give a continuously varying potential.
	(iii)	How many electrons pass through an electric bulb in one minute if the $300 \text{ mA}$ current is passing through it?
	(iv)	In Parallel Resonant Circuits , at resonance, the branch currents $I_L$ and $I_C$ may each be larger than the source current $I_r$ . Why?
	(v)	In a R - L Circuit , will the current lag or lead the voltage ? Illustrate your answer by a vector diagram .
	(vi)	Explain the conditions under which Electromagnetic Waves are produced from a source.
	(vii)	Distinguish between Forbidden Energy States and Forbidden Energy Gap.
	(viii)	How would you obtain n - type and p - type material from pure Silicon ? Illustrate it by schematic diagram .
	(ix)	What is meant by Para , Dia and Ferromagnetic Substances ? Give examples for each.
	(x)	What is Current gain of transistor? Write its relation.
	(xi)	Why a Photodiode is operated in reverse biased state ?
	(xii)	What is the biasing requirement of the junctions of a transistor for its normal operation? Explain how these requirements are met in a Common Emitter Amplifier ?
Q.No.4	(i)	Is it possible to change both the area of the loop and the magnetic field passing through the loop and still not have an induced emf in the loop?
	(ii)	What is Ideal Transformer? Also draw the symbol of Transformer.
	(iii)	Define One Henry (1H) .
	(iv)	Photon A has twice the energy of Photon B . What is the ratio of momentum of A to that of B?
	(v)	What advantages an Electron Microscope has over an Optical Microscope?
	(vi)	Calculate the de Broglie Wavelength of an electron moving at $40 \text{ ms}^{-1}$ .
	(vii)	Explain Planck's assumption about the energy distribution curves of Black Body Radiation .
	(viii)	How can the Spectrum of Hydrogen contain so many lines when Hydrogen contains one electron?
	(ix)	Differentiate between Excitation Potential and Ionization Potential .

B

P.T.O.

L.K.No. 1464

( Part - II )

3 x 8 = 24

BWP-2-24

Q.No.5	(a)	Write a note on Construction , working and uses of Potentiometer.	(5)
	(b)	Determine the Electric Field at the position $\vec{r} = (4\hat{i} + 3\hat{j})$ m caused by a point charge $q = 5.0 \times 10^{-6}$ C placed at origin.	(3)
Q.No.6	(a)	Differentiate between Motor and Generator. Is Back Motor effect in generators in accordance with the law of Conservation of Energy ? Explain.	(5)
	(b)	A Galvanometer having an Internal Resistance $R_g = 15.0 \Omega$ gives full scale deflection with Current $I_g = 20.0$ mA . It is to be converted into an Ammeter of range $10.0$ A . Find the value of Shunt Resistance $R_s$ .	(3)
Q.No.7	(a)	What is the Principle of Virtual Ground ? Apply it to find the gain of an Inverting Amplifier.	(5)
	(b)	A $10$ mH , $20 \Omega$ coil is connected across $240$ V and $180/\pi$ Hz Source. How much Power does it dissipate?	(3)
Q.No.8	(a)	Explain Intensity Distribution diagram of Black Body Radiation .	(5)
	(b)	The length of a Steel Wire is $1.0$ m and its cross-sectional area is $0.03 \times 10^{-4}$ m <sup>2</sup> . Calculate the work done in stretching the wire when a force of $100$ N is applied within the elastic region. Young's Modulus of Steel is $3.0 \times 10^{11}$ Nm <sup>-2</sup> .	(3)
Q.No.9	(a)	What is Nuclear Reactor ? Describe the functions of its main parts.	(5)
	(b)	Electrons in an X-ray tube are accelerated through a Potential Difference of $3000$ V. If these electrons were slowed down in a target , what will be the minimum Wavelength of X-rays produced ?	(3)

