Roll No. _____ (To be filled in by the candidate)

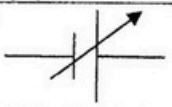
(Academic Sessions 2018 – 2020 to 2020 – 2022)

PHYSICS 222-(INTER PART – II) Time Allowed : 20 Minutes

Q.PAPER – II (Objective Type) GROUP – II Maximum Marks : 17

PAPER CODE = 8474 LHR-G2-22

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	$\frac{E}{B}$ has the unit of : (A) meter (B) ms^{-1} (C) ms^{-2} (D) s^{-2}
2	If V_o is peak value of A.C. voltage then mean square value of voltage is : (A) $\frac{V_o}{\sqrt{2}}$ (B) V_o^2 (C) $\frac{1}{2}V_o^2$ (D) V
3	A black body is both an ideal absorber and an ideal : (A) Reflector (B) Radiator (C) Conductor (D) Insulator
4	Energy given out per nucleon per fission of heavy element like uranium is : (A) 200 MeV (B) 208 MeV (C) 5 MeV (D) 0.9 MeV
5	Electric flux through a closed surface enclosing a charge depends on : (A) Medium (B) Size (C) Shape (D) Location of charge
6	 is symbol of : (A) High tension battery (B) Low tension battery (C) Variable voltage battery (D) Zero resistance battery
7	Thermo-couples produce electric energy by : (A) Heat (B) Chemical energy (C) Sunlight (D) Mechanical energy
8	When PN junction is conducting then its resistance is of the order of : (A) Mega Ohm (B) Kilo Ohm (C) 100 Ohm (D) Few Ohms
9	Two quark combination forms : (A) Mesons (B) Baryons (C) Leptons (D) No Composite particle
10	Lenz's law is also a statement of law of conservation of : (A) Linear momentum (B) Angular momentum (C) Energy (D) Charge
11	Unit of electric intensity is same as : (A) Force (B) Potential gradient (C) Viscosity (D) Magnetic field
12	If the frequency of A.C is 40 Hz then current passing through filament bulb get brilliance : (A) 100 times (B) 80 times (C) 40 times (D) 50 times
13	A metal meter rod is moving at the speed of 0.5 ms^{-1} in the direction parallel to a 0.5 T magnetic field, emf will be : (A) 0.25 V (B) 0.5 V (C) Zero (D) 0.125 V
14	In cubical crystal, all the sides meet at : (A) Acute angle (B) Abtuse angle (C) Right angle (D) 45°
15	Work done by a magnetic force of 5 N when a q charge is displaced 2 m is : (A) Non-zero (B) Zero (C) 10 J (D) 5 J
16	The observations on objects moving very fast, approaching the speed of light, are well explained by : (A) Quantum theory (B) Newton's law (C) Special theory of relativity (D) Kepler's law
17	Plank's constant has the unit of : (A) Linear momentum (B) Angular momentum (C) Torque (D) Force

Roll No. _____ (To be filled in by the candidate)

(Academic Sessions 2018 – 2020 to 2020 – 2022)

PHYSICS 222-(INTER PART – II) Time Allowed : 2.40 hours

PAPER – II (Essay Type) GROUP – II Maximum Marks : 68

SECTION – I

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2. Write short answers to any EIGHT (8) questions : **16**

(i) What is meant by electric polarization?

(ii) Prove that electric intensity in side a hollow charged sphere is zero.

(iii) Electric lines of force never cross each other . Why?

(iv) How can you identify that which plate of the capacitor is positively charged? Explain it.

(v) Write down any four uses of CRO.

(vi) What is Lorentz force? Write down its formula.

(vii) Why does the picture on the TV screen is distorted when a magnet is brought near its screen?

(viii) How a galvanometer can be made sensitive?

(ix) What is the binding energy? Write down the name of element which has highest value.

(x) Heavy nuclei are unstable. Why?

(xi) What do you mean by dead time in Geiger-Muller Counter?

(xii) What factors make a fusion reaction difficult to achieve?

3. Write short answers to any EIGHT (8) questions : **16**

(i) Write down four sources of current.

(ii) Do bends in a wire affect its electrical resistance? Explain.

(iii) Is the filament resistance lower or higher in a 500 w , 220 volt bulb than in a 100 w, 220 volt bulb?

(iv) Define the terms peak value and peak to peak value.

(v) Discuss two uses of three phase A.C. supply.

(vi) How the reception of a particular radio station is selected on your radio set?

(vii) Explain ductile substances and brittle substances.

(viii) What is meant by hysteresis loss?

(ix) Show that units of modulus of elasticity and stress are the same.

(x) Why charge carriers are not present in the depletion region?

(xi) What is the principle of virtual ground?

(xii) Calculate the gain of a non-inverting amplifier. When R_1 = infinity and R_2 = zero

4. Write short answers to any SIX (6) questions : **12**

(i) Can a step-up transformer increase the power level? Explain.

(ii) How would you position a flat loop of a wire in changing magnetic field, so that there is no emf induced in the loop?

(iii) Write down the factors upon which the mutual inductance depend.

(iv) Distinguish between A.C. generator and transformer.

(Turn Over)

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4. (v) Will higher frequency light eject greater number of electrons than low frequency light?

(vi) When does light behave as a wave? When does it behave as particle?

(vii) State Stefen's Boltzman law. Also write the value of Stefen's constant.

(viii) Find the shortest wavelength of radiation in the Balmer series.

(ix) What do we mean when we say that the atom is excited?

SECTION – II

Note : Attempt any THREE questions.

5. (a) State and explain Gauss's law, also calculate the electric intensity due to an infinite sheet of charge. 5

(b) The resistance of an iron wire at 0 °C is $1\times10^{4}\Omega$. What is the resistance at 500 °C, if the temperature co-efficient of resistance of iron is $5.2\times10^{-3}K^{-1}$? 3

6. (a) State Ampere's law and apply it to find magnetic field due to a current carrying solenoid. 5

(b) A solenoid has 250 turns and its self inductance is 2.4 mH. What is the flux through each turn when current is 2 A? What is the induced emf when current changes at 20 As^{-1}? 3

7. (a) Write a note on transistor as an amplifier. 5

(b) A circuit has an inductance of $\frac{1}{\pi}H$ and resistance of 2000 Ω. A 50 Hz A.C. is supplied to it. Calculate the reactance and impedance offered by the circuit. 3

8. (a) Define photoelectric effect. Give its explanation on the basis of Quantum theory. 5

(b) A wire 2.5 m long and cross-section area $10^{-5}m^{2}$ is stretched 1.5 mm by a force of 100 N in the elastic region. Calculate Young's modulus. 3

9. (a) What is laser? Write down its properties and also explain laser action in detail. 5

(b) Find the mass defect and binding energy of the deuteron nucleus. The experimental mass of deuteron is $3.3435\times10^{-27}kg$. 3