1222 Warning:- Please write your Roll No. in the space provided and sign. Roll No----------
(Inter Part – II) (Session 2018-20 to 2020-22) Sig. of Student ----------

Physics (Objective) **(Group I)** SGD-91-22 **Paper (II)**

PAPER CODE 4471

Time Allowed:- 20 minutes Maximum Marks:- 17

Note:- You have four choices for each objective type question as A, B, C and D. The choice which you think is correct; fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Write **PAPER CODE**, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q. 1

1) A rubber ball of radius 2 cm has a charge of 5 μc on its surface, which is uniformly distributed. The value of E at its Centre is
(A) 10 NC^{-1} (B) Zero (C) 2.5 NC^{-1} (D) 5×10^{-6} NC^{-1}

2) The minimum value of charge on free particle is
(A) $\frac{2}{3}e$ (B) $\frac{1}{3}e$ (C) $\frac{-2}{3}e$ (D) e

3) During danger the 'eel' turn itself into a living battery. Then the potential difference between its head and tail can be upto
(A) 600 V (B) 440 V (C) 220 V (D) 160 V

4) The sum of electric and magnetic force is called
(A) Maxwell force (B) Newton's force (C) Lorentz force (D) Centripetal force

5) Output waveform of sweep or time base generator is
(A) Saw tooth wave (B) Digital wave (C) Sinusoidal wave (D) Square wave

6) Emf is induced due to change in
(A) Electric flux (B) Magnetic flux (C) Electric potential (D) Electric current

7) When the motor is just started, its back emf is
(A) Maximum (B) Minimum (C) Almost zero (D) Equal to current

8) An A.C Voltmeter reads 220V, its peak value will be
(A) 255 V (B) 311.12 V (C) 300 V (D) 200 V

9) When we acclerate the charge, which type of waves are produced?
(A) Mechanical waves (B) Travelling waves (C) Stationary waves (D) Electromagnetic waves

10) A device used to detect very weak magnetic fields produced by brain is named as
(A) MRI (B) CAT Scans (C) SQUIDS (D) C.R.O

11) The magnitude of voltage gain of an amplifier having r_{ie}=1 ohm, β =100 and R_c=200 ohm is
(A) 2000 (B) 1000 (C) 500 (D) 5

12) Which one is used as temperature sensor in electrical circuit?
(A) Capacitor (B) diode (C) LDR (D) Thermistor

13) The rest mass of photon is
(A) infinite (B) zero (C) 1.6×10^{-27} kg (D) 3×10^{8} kg

14) The materialization of energy takes place in the process of
(A) photoelectric effect (B) Compton effect (C) Pair Production (D) Annihilation of matter

15) The unit of Rydberg's constant R_H is
(A) ms^{-1} (B) m (C) m^2 (D) m^{-1}

16) The unit of decay constant is
(A) Second (B) $(Second)^{-1}$ (C) m^{-1} (D) m.K

17) Half life of radioactive isotope of Iodine-131 is
(A) 6 days (B) 8 days (C) 10 days (D) 12 days

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Physics (Subjective) **(Group I)** (Session 2018-20 to 2020-22) (Inter Part - II) **Paper (II)**

Time Allowed: 2.40 hours **Section --------- I** Maximum Marks: 68

2. Answer briefly any Eight parts from the followings:- SGD-G1-228 **× 2 = 16**

(i) How can you identify that which plate of a capacitor is positively charged?

(ii) Suppose that you follow an electric field line due to positive point charge. Do electric field and the potential increase or decrease?

(iii) What is meant by EEG and ECG? **(iv)** Show that $1\ eV = 1.6\times10^{-19} J$

(v) Why the voltmeter should have a very high resistance?

(vi) Is it possible to orient a current loop in a uniform magnetic Field such that the loop will not tend to rotate? Explain.

(vii) Write any two uses of CRO. **(viii)** What is dead beat galvanometer?

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

(x) What do you understand by "background" radiations? State two sources of this radiation.

(xi) Define mass defect and binding energy. **(xii)** What are basic forces of nature?

3. Answer briefly any Eight parts from the followings:- **8 × 2 = 16**

(i) A charge of 90 C passes through a wire in 1 hour and 15 minute. What is the current in the wire.

(ii) Why does the resistance of a conductor rise with temperature?

(iii) Differentiate between electro motive force (EMF) and potential difference?

(iv) What do you mean by phase lag and phase lead?

(v) How does doubling the frequency affect the reactance of (a) an inductor (b) a capacitor

(vi) Explain the conditions under which electromagnetic waves are produced from a source?

(vii) Differentiate between ductile and brittle substances; Give Examples?

(viii) Define retentivity and coercive current?

(ix) What is meant by para, dia and ferromagnetic substances? Give examples for each.

(x) The anode of diode is 0.2 V positive with respect to its cathode. Is it forward biased?

(xi) Why a photodiode is operated in reverse biased state?

(xii) Define rectification. Draw a circuit diagram of half wave rectification.

4. Answer briefly any Six parts from the followings:- **6 × 2 = 12**

(i) Write any two methods in which current induce in a coil.

(ii) Show that $\in$ and $\frac{\Delta\phi}{\Delta t}$ have same units. **(iii)** Why the motor is overloaded? Give its Reason.

(iv) Does the induce emf always act to decrease the Magnetic flux through the circuit?

(v) What are the measurement on which two observers in relative motion will always agree upon?

(vi) As a solid is heated and begin to glow, why does it first appear red?

(vii) Write two postulates of special theory of relativity.

(viii) Can X-rays be reflected, refracted Diffracted and Polarized just like any other waves? Explain.

(ix) Is energy conserved when an atom emit a photon of light.

Note: Attempt any three questions. **Section ---------- II** **(8 × 3 = 24)**

5. (a) What is motional emf. Derive an expression for it.

(b) How fast must a proton move in a magnetic field of 2.50×10^{-3} T such that magnetic force is equal to its weight.

6. (a) What is the behaviour of A.C. current and voltage in an inductor? Discuss power loss through an inductor over a period.

(b) The current flowing into the base of a transistor is 100 μA. Find its collector current and its emitter current, if the value of current gain is 100.

7. (a) Explain Photo electric effect. Write its experimental results, also the failure of classical theory.

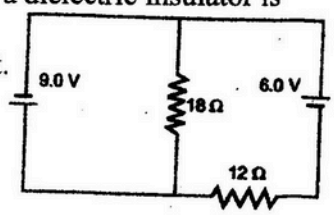
(b) What stress would cause a wire to increase in length by 0.01%, if the Young's modulus of wire is 12×10^{10} Pa. What force would produce this stress, if the diameter of wire is 0.56 mm.

8. (a) What is meant by half life of radioactive element? How it can be determined by the decay of radioactive element.

(b) An Electron jumps a level $E_i = -3.5\times10^{-19}$ J to $E_f = -120\times10^{-18}$ J What is the wavelength of emitted light?

9. (a) Explain capacitance of parallel plate capacitor. What happens when a dielectric insulator is placed between the plates?

(b) Find the current which flows in all the resistance of the given circuit.



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