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Inter. (Part II) A- 2019

(For all sessions)

Paper Code | 8 | 4 | 7 | 7

Roll No. 762490 *to be filled in by the candidate.*

RWP-12-19

Physics (Objective Type)

Time: 20 Minutes **Marks: 17**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. In RLC series circuit, at higher frequencies.

(A) $X_L = X_c$ (B) $X_L > X_c$ (C) $X_L < X_c$ (D) $X_L = 0$

2. Which one belongs to trivalent group?

(A) Aluminium (B) Antimoney (C) Phosphorous (D) Arsenic

3. Colour of light emitted by LED depends upon

(A) its forward biasing (B) its reverse biasing (C) type of material (D) forward current

4. At low temperature, a body emits radiations of:

(A) shorter wavelength (B) longer wavelength (C) high frequency (D) high frequency & shorter wavelength

5. The shortest wavelength in Lyman series is equal to:

(A) R_H (B) $\frac{R_H}{2}$ (C) $\frac{1}{R_H}$ (D) $\frac{2}{3} R_H$

6. In the reaction, $X + {}^{12}_{8}O \rightarrow {}^{14}_{7}N + {}^{4}_{2}H$, X is:

(A) ${}^{1}_{1}H$ (B) ${}^{2}_{1}H$ (C) ${}^{0}_{0}c$ (D) ${}^{0}_{1}c$

7. If the charges are doubled and the distance between them is also doubled, then Coulomb's force will be:

(A) double (B) halved (C) remains same (D) four times

8. A rubber ball of radius 2cm has a charge of $5\mu c$ 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) $5 \times 10^{-6} NC^{-1}$

9. Which one of the following relation is correct?

(A) joule=volt x ampere (B) joule=coulomb / volt (C) joule=volt / ampere (D) joule=coulomb x volt

10. In carbon resistors, which colour band indicates the tolerance of $\pm 10\%$?

(A) White (B) Silver (C) Gold (D) Violet

11. For an open circuit, terminal potential difference 'Vt' is.

(A) Vt=2emf (B) Vt=emf (C) Vt>emf (D) Vt<emf

12. An electron travelling at 10^6 m/s enters parallel in a magnetic field of 1 tesla, the magnetic force acting on it is.

(A) Zero (B) $10^{-12}N$ (C) $10^3 N$ (D) $1.6 \times 10^{-13}N$

13. When a charged particle is projected opposite to the direction of magnetic field, it experiences a force equal to.

(A) $quB\cos\theta$ (B) $quB\sin 90$ (C) quB (D) zero

14. In order to increase the range of voltmeter R_H is:

(A) increased (B) decreased (C) unchanged (D) increased by 4 times

15. Which device permits the flow of D.C?

(A) Capacitor (B) Photocell (C) Inductor (D) transformer

16. For an ideal step up transformer.

(A) $N_p > N_s$ (B) $V_s I_s > V_p I_p$ (C) $V_s < V_p$ (D) $I_s < I_p$

17. When a metal detector comes close to a metal then its frequecy

(A) becomes double (B) remains same (C) becomes half (D) increases

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Roll No. _____ *(To be filled in by the candidate)* (For all sessions) RWP-12-19

Physics (Essay Type)

Time: 2:40 Hours   Section - I   Marks: 68

2- Write short answers of any eight parts from the following.   2 x 8 =16

i. Show that Σ and $\frac{\Delta\phi}{\Delta t}$ have the same units.

ii. What is the effect of current passing through a long straight wire?

iii. Electric lines of force never cross. Why?

iv. What is motional emf? State the factors it depends upon.

v. What is the back emf effect in motors?

vi. Why the resistance of ammeter should be very low?

vii. Why does the picture on T.V screen become distorted when a magnet is brought near the screen?

viii. Write down the factors upon which the force on current carrying conductor placed in uniform magnetic field depands

ix. What is Coulomb's law and effect of dielectric on Coulomb's force?

x. State Gauss's law and its mathematical expression.

xi. Is $\vec{E}$ necessarily zero inside a charged rubber balloon if balloon is spherical? Assume that charge is distributed uniformly over the surface.

xii. Does the induced emf in a circuit depend on the resistance of the circuit? Does induced current depend on the resistance of the circuit?

3- Write short answers of any eight parts from the following.   2 x 8 =16

i. What are difficulties in testing whether the filament of a lighted bulb obey's ohm's law?

ii. How heating effect produced when current flow through the conductor?

iii. What is Thermister? Give its two applications.

iv. What is Choke? Why is it used in A.C circuit?

v. At what frequency will an inductor of 1.0H have a reactance of 500Ω?

vi. How many times per second will an incandescent lamp reach maximum/brilliances when connected to a 50Hz source?

vii. What are ductile and brittle substances? Give an example of each.

ix. What is meant by hysteresis loss? How is it used in the construction of a transformer?

viii. What is meant by Dia and Feromagnetic substances? Give an example for each.

xi Write four applications of photo diode

xii Draw the symbol and truth table of NOR gate.

x. Why a photo diode is operated in reverse biased state?

4- Write short answers of any six parts from the following.   2 x 6 =12

i. What advantages an electron microscope has over an optical microscope?

ii. Why do we not observe compton effect with visible light?

iii. Define positron and Heisenberg uncertainty principle.

iv. What do we mean when we say that atom is excited?

v. What are the advantages of laser over ordinary light?

vi. How can radioactivity help in the treatment of cancer?

vii. What factors make a fusion reaction difficult to achieve?

viii. What do you mean by the terms critical mass?

ix. Define Hadrons and Leptons

Section - II

NOTE: Answer any three questions from the following.   8x3=24

5. (a) Define a capacitor and capacitance. Derive an expression for capacitance of a parallel plate capacitor when a dielectric material is inserted between the plates.   05

 (b) The resistance of an iron wire at 0^oC is $1\times10^4\ \Omega$. What is the resistance at 500^oC, if the temperature co-efficient of resistance of iron is $5.2\times10^{-3}K^{-1}$?   03

6. (a) What do you mean by the galvanometer? Write down the principle, construction and working of galvanometer.   05

 (b) A square coil of side 16cm has 200 turns and rotates in a uniform magnetic field of magnitude 0.05T. If the peak emf is 12V. What is angular velocity of the coil?   03

7. (a) What is RC series circuit? Calculate the impedance and phase angle for RC series circuit.   05

 (b) The current flowing into the base of transistor is 100 μA. Find its collector current I_C and emitter current I_e if the value of current gain β is 100   03 / 05

8. (a) What is meant by photo electric effect? Explain it with refrence to (i). Intensity of light (ii) Frequency of light. Also write and discuss its important results.   05 / 03

 (b) What stress would cause a wire into increase in length of 0.01%. If Young's modulus of the wire is $12\times10^{10}Pa$? What force would produce this stress if the diameter of the wire is 0.56mm?   05

9. (a) Describe the principle, construction and working of Wilson's cloud chamber. How it provide information about charged particle?   05

 (b) Calculate the longest wavelength of radiation for the Paschen Series   03