Physics

Note: Time allowed for Section-B and Section-C is 2 Hours and 40 minutes.

SECTION-B

Q2: Answer any TEN parts. Each part carries FOUR marks.

1) Show that Coulomb's Law fits into Newton's 3rd Law of Motion?
2) How are units of volts and electron volts related? How do they differ?
3) A heavy duty battery of truck maintains a current of 3A for 24 hours. How much charge flows from the battery during this time?
4) Calculate the resistance of a wire 10m long that has a diameter of 2mm and resistivity of $2.63 \times 10^{-8}\ \Omega m$.
5) How does a current carrying coil behave like a bar magnet?
6) How electromagnetic induction is used in cook tops in electric ranges?
7) The value of A.C voltage across 0.5 μF capacitor is $16\text{Sin}(2\text{x}10^{3})$V. Find capacitive reactance?
8) Coercive force of steel is greater than iron. Why?
9) Why the base current is weak as compare to collector current?
10) Write a note on pair annihilation.
11) Write down few applications of x-rays.
12) Describe the interaction of radiations with matter?
13) What is nuclear fission chain reaction? Explain.

SECTION-C

Note: Attempt any THREE questions. All questions carries equal marks.

Q3: (a) Define and explain electric potential energy and electric potential due to a point charge.

(b) Two positive charges of $15\text{x}10^{-10}$C and $13\text{x}10^{-10}$C are placed 12cm apart. Find the work done bringing the charges 4cm closer.

Q4: (a) Explain construction and working of AC generator.

(b) Current in a circuit falls from 5.0A to 0A in 1s. If an average emf of 200V induced, calculate self inductance of the coil?

Q5: (a) What is Half life of a radio-active nucleus? Derive mathematical relation for it.

(b) The temperature of the human skin is 35°C. What is the wavelength at which the peak occurs in the radiation emitted from the skin?

Q6: Give a brief explanation of any two topics.

(a) Determine the electric field intensity due to infinite sheet of charge

(b) Explain RLC Series AC circuit in detail.

(c) Describe Compton's Effect