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

(Academic Sessions 2015 – 2017 to 2017 – 2019)

PHYSICS 219-(INTER PART – II) Time Allowed : 2.40 hours

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

SECTION – I

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

(i) State Gauss's law and write its mathematical relation.

(ii) Define electron volt and show that $1\,eV = 1.6\times10^{-19}\,J$.

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

(iv) Do electrons tend to go to region of high potential or of low potential?

(v) State Lorentz force and write its formula.

(vi) Write two uses of cathode ray oscilloscope.

(vii) How can you use a magnetic field to separate isotopes of chemical element?

(viii) Why the resistance of an ammeter should be very low?

(ix) How the induced current can be increased?

(x) What is motional emf and write its mathematical relation?

(xi) Does the induced emf in a circuit depend on the resistance of the circuit? Explain.

(xii) Show that ε and $\frac{\Delta\phi}{\Delta t}$ have the same units.

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

(i) Define conventional current and solar cell.

(ii) Define electrolysis and basic principle of electroplating.

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

(iv) Define peak value and peak to peak value of voltage or current.

(v) A sinusoidal current has rms of 10A. What is the peak value?

(vi) What are superconductors?

(vii) What is meant by para, diamagnetic substances?

(viii) What is meant by strain energy?

(ix) Draw the truth table of XNOR gate.

(x) Why ordinary silicon diodes do not emit light?

(xi) Why is the base current in a transistor very small?

(xii) Define intrinsic and extrinsic semi-conductor.

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

(i) Will higher frequency light eject greater number of electrons than low frequency light?

(ii) Photon A has twice the energy of photon B. What is the ratio of momentum of A to that of B?

(iii) What is the energy of photon in a beam of infrared radiation of wavelength 1240 nm?

(iv) What are the advantages of LASER over ordinary light?

(v) Can the electron in ground state of hydrogen absorb a photon of energy 13.6 eV and greater than 13.6 eV?

(vi) Define the isotopes of an element. Write down the isotopes of hydrogen.

4. (vii) What is radioactive decay? Give an example.

(viii) What factor does make a fusion reaction difficult to achieve?

(ix) How can radioactivity help in the treatment of cancer?

SECTION – II

Note : Attempt any THREE questions.

5. (a) State Gauss's law and apply it to find electric field intensity due to an infinite sheet of charge. 5

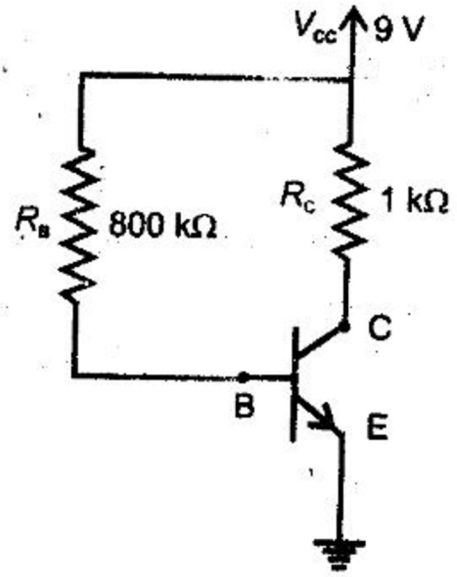
(b) A platinum wire has resistance of 10 Ω at 0 °C and 20 Ω at 273 °C. Find the value of temperature co-efficeint of resistance. 3

6. (a) Define galvanometer. How it is converted into an ammeter and voltmeter? 5

(b) A pair of adjacent coils has a mutual inductance of 0.75 H. If the current in the primary changes from 0 to 10 A in 0.025 s, what is the average induced emf in the secondary? What is the change in flux in it, if the secondary has 500 turns? 3

7. (a) Discuss the behaviour of an inductor in an A.C. circuit and write an expression for the inductive reactance. 5

(b) In circuit as shown in fig. there is negligible potential drop between B and E. If β is 100, calculate : (i) base current. (ii) collector current. (iii) potential drop across R_c (iv) V_{CE} 3



8. (a) Write down the postulates of special theory of relativity. Discuss the relation of time dilation, length contraction, mass variation and energy-mass relation with reference of this theory. 5

(b) A 1.0 m long copper wire is subjected to stretching force and its length increased by 20 cm. Calculate the percent elongation which the wire undergoes. 3

9. (a) What are inner shell transitions? Describe the production of X-rays and their uses. 5

(b) How much energy is absorbed by a man of mass 80 kg who receives a lethal whole body equivalent dose of 400 rem in the form of low energy neutrons for which RBE factor is 10? 3