

Attempt all parts.

Physics 2019

- Q.No.1 (a) Choose the correct answers.
- The Unit of electric flux is  
(a)  $\frac{N-m}{c^2}$  (b)  $\frac{N-m^2}{c}$  (c)  $\frac{N-m^2}{c^2}$  (d)  $\frac{N-m}{c}$
  - If  $R=25$  ohm them conductance will be  
(a)  $0.4\Omega^{-1}$  (b)  $0.04\Omega^{-1}$  (c)  $4.0\Omega^{-1}$  (d)  $0.44\Omega^{-1}$
  - 1 webar =  
(a)  $1N - mA$  (b)  $\frac{N-m}{A}$  (c)  $\frac{N}{mA}$  (d)  $NmA$
  - The material used in the fluorescent screen of CRO is  
(a) Magnesium (b) Glass (c) Phosphor (d) Sodium
  - The back emf exist in  
(a) Generator (b) Motor (c) Transformer (d) Diodes
  - The measuring of shearing strain is  
(a)  $\tan\theta$  (b)  $\frac{\Delta L}{L}$  (c)  $\frac{\Delta V}{V}$  (d) None of them
  - The velocity of laser light is  
(a) Less than ordinary light (b) More than ordinary light (c) Equal to ordinary light (d) Non of them
  - Sub atomic particles are divided into groups  
(a) 2 (b) 3 (c) 4 (d) 5
  - Potential barrier across the P-N junction of Germanium is  
(a) 0.3V (b) 0.5V (c) 0.7V (d) 0.9V
- (b) Fill in the blanks.
- The value of  $\epsilon_0$  is.....
  - The magnetic flux is maximum when the angle between B and A is .....
  - Positron is the antiparticle of.....
  - The inverse of OR gate is.....
  - The reciprocal of resistance is called.....
  - Longitudinal strain is defined as.....
  - The value of Plank's constant is.....

SECTION - B (14 x 3 = 42) Marks

Q.No.2. Attempt any fourteen parts. The answers should not exceed 4 lines.

- Prove that  $\frac{IV}{Im} = \frac{IN}{C}$
- What is the difference between resistance and conductance. Write down their units.
- How do we make the track of electrons been visible to find e/m.
- In which procedure electron-positron pair is created explain.
- Why energy losses reduce the efficiency of a transformer.
- Convert  $2.177 \times 10^{-18}$  Joule into electron Volts and 13.6 eV into Joule.
- How proton is made up from Quarks. Draw the diagram.
- if  $E_1 = 13.6 \text{ eV}$  then find the value of energy corresponding to  $E=3$  and  $E=5$ .
- Calculate the rest mass of photon.
- Write down the truth table of XoR and NAND gate.
- Differentiate diamagnetic and paramagnetic materials.
- Prove that  $1\text{eV} = 1.6 \times 10^{-19}$ .
- Find the resistance of a resistor having white blue, and yellow colour bands.
- Define Volt, ampere and Farad.
- At high temperature why conductors donot obey ohm's law.
- Differentiate inertial and non inertial frame of reference.
- How chain reaction is controlled in atomic reactor.
- Differentiate the threshold frequency and frequency write down their units.

SECTION - C (6 x 3 = 18) Marks

Attempt any three Questions .

- Q.No.3. Show that electric field near a plane charged surface is  $E = \frac{\sigma}{2\epsilon_0}$ .
- Q.No.4. What is the principle of laser. Describe the process of population inversion and meta stable states with figure.
- Q.No.5. Explain the full wave rectification using bridge circuit . Define coulomb's law.
- Q.No.6. What is the heating effect of current. Drive the expression for power dissipation in resistors in detail.
- Q.No.7. Explain the condition under which electro magnetic waves are produced.

SECTION - D (3 x 3 = 9) Marks

Attempt any three Problems.

- Q.No.8. Find the mutual inductance of the Coil when electric current 1.4 ampere in one of the coils is reduced to 0.5 ampere in 0.06 sec causes an induced emf of 5 Volts in the other coil.
- Q.No.9. Compute the shortest wave length radiation in the bracket series and  $n=\infty$ .
- Q.No.10. An oil drop of  $2.35 \times 10^{-15}$  kg is held motionless between parallel plates. The distance between the plates is 2cm and potential differences is 4000 Volts. Calculate the charge on electron.
- Q.No.11. What is the peak value of voltage if its root mean square value is 2v.
- Q.No.12. A steel wire 4mm in diameter is stretched by a force of 1500N. The length of steel wire is 1.5m. Calculate the tensile stress.