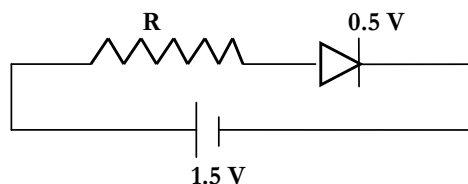


APPENDIX – V  
SAMPLE QUESTIONS

PHYSICS

- The capacitance of two concentric spheres of radii  $R_1$  and  $R_2$  is ( $R_2 > R_1$ )  
 A)  $4\pi \epsilon_0 \frac{R_1 R_2}{R_2 - R_1}$       B)  $4\pi \epsilon_0 R_1$       C)  $4\pi \epsilon_0 R_2$       D)  $4\pi \epsilon_0 \frac{(R_2 - R_1)}{R_1 R_2}$
- A magnet of length 10 cm and magnetic moment 1 Am<sup>2</sup>, is placed along the side AB of an equilateral triangle ABC. If the length of side AB is 10 cm, the magnetic field at point C is  
 A)  $10^{-9}$  T      B)  $10^{-4}$  T      C)  $10^{-5}$  T      D)  $10^{-7}$  T
- In an inductor, the current I (in Ampere) varies with time t (in second) as  $I = 5 + 16t$ . If the emf induced in the inductor is 10 mV, then its self inductance is  
 A)  $6.25 \times 10^{-4}$  H      B)  $6.25 \times 10^{-3}$  H      C)  $7.5 \times 10^{-4}$  H      D)  $7.5 \times 10^{-3}$  H
- The fringe width obtained in Youngs double – slit experiment conducted in a medium of refractive index 3 is 2 mm. The fringe width in vacuum is  
 A) 5 mm      B) 1.5 mm      C) 6 mm      D) 1 mm
- Three equal charges  $+Q$  each are placed on the vertices of an equilateral triangle. A charge  $+q$  is initially placed at the centre of the triangle. If this charge ( $+q$ ) is slightly displaced towards a vertex and left free, the charge will  
 A) continue moving towards the corresponding vertex  
 B) move away from the corresponding vertex  
 C) return back to the centre  
 D) oscillate about the centre
- Three capacitors of capacitances  $2\mu\text{F}$ ,  $4\mu\text{F}$  and  $X \mu\text{F}$  are connected in series. If the resultant capacitance is  $12/11 \mu\text{F}$ , what is the value of X?  
 A)  $6 \mu\text{F}$       B)  $8 \mu\text{F}$       C)  $5 \mu\text{F}$       D)  $4 \mu\text{F}$
- Two electron beams having velocities in the ratio of 1:2 are separately subjected to regions of magnetic field strength in the ratio of 1:2, respectively. The ratio of the radii of the circular paths they will traverse will be  
 A) 1:4      B) 4:1      C) 1:2      D) 1:1
- An ideal transformer with a step up ratio of 100 operates with an input voltage of 230 V and current of 5 A. The output current at the secondary will be  
 A) 0.05 A      B) 0.5 A      C) 0.005 A      D) 500 A
- The ratio of the ionization energy of Bohr’s hydrogen atom and hydrogen like Lithium atom is  
 A) 1:1      B) 1:3      C) 1:9      D) 9:1
- The diode used in the circuit shown in the figure has a constant voltage drop of 0.5 V at all currents and a maximum power rating of 100 mW. What should be the value of the resistor R connected in series with the diode for obtaining maximum current



- A)  $1.5 \Omega$       B)  $5 \Omega$       C)  $6.67 \Omega$       D)  $200 \Omega$