APPLIED PHYSICS - II

2nd/Common/2154/2351/5423/Nov'15

Duration: 3hrs **M.Marks=75**

SECTION A

Q1 FILL IN THE BLANKS **15x1=15**

(a) Velocity of light is maximum in ……..
(b) For sustained interference two sources must be ……. Sources.
(c) Value of absolute permittivity of air is …….
(d) 1Volt is numerically equal to ……
(e) Forbidden energy band gap of Silicon (Si) is …….

STATE TRUE OR FALSE

f) Electric current is vector quantity.
g) To decrees the capacity of parallel plate capacitor, a sheet of mica should be introduced between the plates.
h) Susceptibility is positive and large for ferromagnetic substances.
i) Ruby laser is solid state laser.
j) Holes are majority carriers in N type semiconductor.

CHOOSE CORRECT ONE

k) The refractive index of glass with respect of air is 3/2.The refractive index of air with respect of glass is:
(a)1 (b) 3/2 (c) 1/3(d) none of these
l) Electric lines of force at negative point charge are
(a) radial inwards (b) radial outwards (c) circular (d) all of these
m) Kirchhoff's second law is based on law of conservation of
(a) charge (b) mass (c) energy (d) none of these
n) When the conductivity of semiconductor is only due to breaking of covalent bonds then semiconductor is called
(a) extrinsic (b) acceptor (c) intrinsic (d) none of these
o) An electron can remain in excited state for about
(a) 10^{-6} sec (b) 10^{-9} sec (c) 10^{-8} sec (d) 10^{-10} sec

SECTION B

Q2 ATTEMPT ANY SIX **6x5=30**

a) What is total internal reflection? Explain with Diagram.
b) An astronomical telescope having magnifying power of 5 and length 24 cm consists of two lenses. Find the focal length of lenses.
c) State and prove Gauss law of electrostatics.
d) Capacitors of 4,5 and 6μF are connected in series and in parallel. Compare the effective capacitances in two cases.
e) What is wheat stone bridge? Derive the condition for balanced wheat stone bridge.
f) Explain the conversion of galvanometer into ammeter. Why ammeter is always connected in series in circuits.
g) Differentiate between intrinsic and extrinsic semiconductors.
h) Find the force acting on an electron moving with velocity 10^7 m/sec in magnetic field of 10^{-4} Tesla perpendicular to it.

SECTION C

ATTEMPT ANY THREE QUESTIONS: **10x3=30**

Q3 (a) With the help of labeled diagram explain the construction and working of compound microscope and find its magnifying power. **7**
(b) You are given four lenses of focal lengths 30cm, 20cm, 8cm and 2cm.Which two would you prefer for compound microscope and why? **3**
Q4 (a) Derive an expression for electric field intensity due to long charged straight conductor. **7**
(b) A charge of 4μC is placed in an electric field of intensity 50×10^5 N/C .What is the magnitude of force acting on the charge. **3**
Q5 (a) Derive an expression for the force acting on a current carrying conductor placed in magnetic field. **7**
(b) A current carrying conductor is placed in magnetic field. Find the angle between current and magnetic field when force acting on the conductor is maximum and minimum. **3**
Q6 What is Rectifier? Explain full wave bridge rectifier with diagram **10**
Q7 What is Laser? Explain He-Ne laser with diagram. **10**