12 Physics

Name: _____

Roll #: | | | | | | | |

Ti chp12,13,14 21/04/2020 Time: 2h40m; Marks: 85

Wasim Tahir physics center

Q1) Choose the most appropriate option. Cutting / overwriting is not allowed: 17 Marks

i) The torque on current carrying coil is ____

A) $\tau = NIABCos\alpha$ B) $\tau = BILSin\alpha$ C) $\tau = NIABSin\alpha$ D) $\tau = BILCos\alpha$

ii) The amount of energy acquired or lost by an alpha particle as it moves through potential difference of 1V is ____

A) $3.2x10^{-19}$J B) $6.4x10^{-19}$J C) $1.6x10^{-19}$J D) Zero

iii) The magnetic force is simply a

A) Reflecting force B) Deflecting force C) Restoring force D) Gravitational force

iv) For the computation of electric flux, the surface area should be ____

A) Flat B) Curved C) Inclined D) Spherical

v) Sensitivity of a galvanometer can be increased by ____

A) Decreasing the value of torsional couple B) Decreasing the number of turns C) Decreasing area of plane of coil D) Decreasing magnetic field

vi) Resistivity at a given temperature depends upon ____

A) Area of cross section B) Length C) Nature of material for conductor D) Both length and area

vii) A particle having 2e charge falls through a potential difference of 5V. Energy acquired by it is ____

A) 2.5eV B) 20eV C) 0.4eV D) 10eV

viii) The substance having negative temperature coefficient is ____

A) Carbon B) Iron C) Tungsten D) Gold

ix) The S.I. unit of electric flux is ____

A) Nm C^{-1} B) NmC^{-2} C) Nm^2C^{-1} D) Nm^2C^{-2}

x) The value of Coulomb's constant (K) in S.I. units is ____

A) $9x10^9Nm^2C^{-2}$ B) $9x10^9NC^2m^{-2}$ C) $9x10^9$ $N^{-1}m^2C^2$ D) $9x10^9$ Nm^2C^2

xi) Shunt resistor is called ____

A) Bypass resistor B) Specific resistance C) Reactance D) Impedance

xii) The graphical representation of Ohm's law is ____

A) Hyperbola B) Ellipse C) Parabola D) Straight line

xiii) The power output of a lamp is 6W. How much energy does the lamp give out in two minutes?

A) 3J B) 12J C) 120J D) 720J

xiv) $\sum_{r=1}^{N}(B.\Delta L)_r = \mu_0$ is the relation for ____

A) Millikan's law B) Gauss's law C) Ampere's law D) Lenz's law

xv) Two opposite point charges of same magnitude are separated by distance 2d. electric potential mid-way between them is ____

A) 1V B) 2V C) Zero D) V / 2

xvi) Resistance of a voltmeter should be ____ as compared to the resistance across which it is connected.

A) High B) Very high C) Low D) Very low

xvii) A dielectric material is placed between plates of a parallel plate capacitor. Its capacitance increases due to ____

A) Polarization B) Rectification C) Magnification D) Increased electric field

Q2) Write short answers of the following: 44 Marks

i) Describe the force or forces on a positive point charge when placed between parallel plates: (i) with similar and equal charges (ii) with opposite and equal charges.
ii) Define dielectric constant. Give its mathematical form.
iii) What is the number of electrons in one coulomb charge?
iv) Define electron volt. Show that 1eV = 1.6×10^{-19}J.
v) How can you identify that which plate of a capacitor is positively charge?
vi) Electric lines of force never cross each other. Why?
vii) On which factors does electric flux depend upon?
viii) Define resistivity and give its S.I. units.
ix) What is electromotive force? Give its units.
x) Describe a circuit, which will give a continuously varying potential.
xi) What is meant by the term "Tolerance"? Explain.
xii) The resistance of a conductor rises with temperature. Explain why?
xiii) Find the resistance of a filament in 500W, 220V light bulb.
xiv) How can a current loop be used to determine the presence of a magnetic field in a given region of space?
xv) What is dead beat galvanometer?
xvi) If a charged particle moves in a straight line through some region of space, can you say that the magnetic field in the region is zero?
xvii) Write down two uses of CRO.
xviii) Why does the picture on a TV screen become distorted when a magnet is brought near the TV screen?
xix) What is shunt resistance? Explain briefly.
xx) Why the resistance of an ammeter should be very low?
xxi) Explain right hand rule to find the direction of lines of magnetic field.
xxii) Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate? Explain.

Give explanatory answers of the following: 24 Marks

3A) Define electric potential. Derive the expression for electric potential at a certain point due to a point charge.
3B) The electronic flash attachment for a camera contains a capacitor for storing the energy used to produce the flash. In one such unit, the potential difference between the plates of a $750\mu F$ capacitor is 330V. Determine the energy that is used to produce the flash.
4A) What is potentiometer? How it can be used as (i) potential divided (ii) measuring of emf of a cell?
4B) A rectangular bar of iron is 2.0 cm by 2.0 cm in cross section and 40 cm long. Calculate its resistance if the resistivity of iron is $11 \times 10^{-8} \Omega m$
5A) Describe the principle, construction and working of a moving coil galvanometer.
5B) What current should pass through a solenoid that is 0.5m long with 10,000 turns of coper wire so that it will have a magnetic field of 0.4T?