GOVERNMENT DEGREE COLLEGE MUSTAFA ABAD (KASUR)

Physics Part – II **Objective + Subjective**
Re – Test 2014 – Name : _____ **Roll No: (in words) _____**

<u>OBJECTIVE</u>

Time: 20 Minutes **Marks: 17**

Note: Write your roll No. in space provided. Over-writing, cutting, erasing, using of lead pencils will result into loss of marks.

Q.1: <u>Encircle the correct answers.</u>

i. When the medium is insulator the electrostatic force between the charges is:
a) Decreased
b) Zero
c) Increased
d) None of above

ii. Metals are good conductors of electricity because they have.
a) Large number of bounded electrons
b) Small number of electrons
c) Large number of free electrons
d) Small number of free electrons

iii. The number of electrons in one coulomb charge is equal to.
a) 6.25×10^{18} electrons
b) Zero electrons
c) 6.25×10^{-22} electrons
d) 6.25×10^{21} electrons

iv. When a pot difference of 4 volt is applied across resistance, 10 J of energy is converted. Find charge flows.
a) 0.2. C
b) 2.5 C
c) 5.0 C
d) 10.0 C

v. If a charge Q floes through any cross section of the conductor in time t, the current I is:
a) $I = Qt$
b) $I = \dfrac{Q}{t}$
c) $I = \dfrac{t}{Q}$
d) $I = \dfrac{Q^2}{t}$

vi. During electrolysis process, density of $CuSO_4$ solution.
a) Remains constant
b) Decreased
c) Increased
d) None of these

vii. The unit of magnetic induction $\vec{B}$ is:
a) Coulomb
b) Ampere
c) Coulomb/ampere
d) Weber/m^2

viii. The magnetic field is uniform and stronger:
a) Outside the solenoid
b) Inside the solenoid
c) At the central part of the solenoid
d) None of these

ix. The permeability of free space is measured in:
a) Wb/A/m
b) A m/Wb
c) Wb/A m
d) m/Wb A

x. if a electron is projected in a magnetic field with velocity V, it will experience a force:
a) $\vec{F} = e(\vec{B} \times \vec{v})$
b) $\vec{F} = e(\vec{v} \times \vec{B})$
c) $\vec{F} = \vec{v}(e \times \vec{B})$
d) $\vec{F} = e(\vec{v} . \vec{B})$

xi. The magnitude of motional emf is given by:
a. $\varepsilon = -VBL$
b. $\varepsilon = VBL$
c. $\varepsilon = -\dfrac{V}{BL}$
d. $\varepsilon = \dfrac{L}{VB}$

xii. The unit of induced emf is:
a. Ampere
b. Volt
c. Joule/coulomb
d. Both (b) and (c)

xiii. The negative sign in the equation $\varepsilon_L = -L\dfrac{\Delta I}{\Delta t}$ can be explained by:
a. Lenz's law
b. Faraday's law
c. Ampere' law
d. None of these

xiv. One henry is equal to:
a. 1 ohm × 1 sec
b. 1 ohm × 1 hertz
c. 1 ohm × 1 metre
d. All of above

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SUBJECTIVE

Time: 30 min.   **Marks: 20**

Q.2: Write the short answers.   (2×10)

i. The potential is constant throughout a given region of space, is the electrical field zero or non-zero in this region? Explain

ii. How can you identify that which plate of a capacitor is positively charged?

iii. Electric lines of force never cross. Why?

iv. Do electrons tend to go to region of high

v. Do bends in a wire affect its electrical resistance? Explain.

vi. Why does the resistance of a conductor rise with temperature?

vii. Describe a circuit, which will give a continuously varying potential?

viii. Why does the picture on a TV screen become distorted when a magnet is brought near the screen?

ix. Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate? Explain.

x. How can you use a magnetic field to separate isotopes of chemical element?

xi. What should be the orientation of a current carrying coil in a magnetic field so that torque acting upon the coils is (a) maximum (b) minimum?

xii. Why the resistance of an ammeter should be very low?

xiii. Does the induced emf in a circuit depend on the resistance of the circuit? Does the induced current depend on the resistance of the circuit?

xiv. Show that ε and $\dfrac{\Delta\phi}{\Delta t}$ have same units.

xv. Can an electric motor be used to drive an electric generator with the output from the generator being used to operate the motor?

Note: Attempt any TWO questions:

Q.3 **(a)** Define absolute potential. Also calculate the potential at a point due to point charge. (5)

(b) Determine the electric field at the point $\vec{r} = (4\hat{i} + 3\hat{j})$ m caused by a point charge $q = 5.0 \times 10^{-6}$ C placed at origin. (3)

Q.4 **(a)** What is potentiometer? Give its construction and describe its uses in detail. (5)

(b) 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 11×10^{-8} Ω.m. (3)

Q.5 **(a)** Calculate the force on a moving charge in a uniform magnetic field. (5)

(b) What current should pass through a solenoid that is 0.5 m long with 10,000turns of copper wire so that it will have a magnetic field of 0.4T? (3)