Test No. 1 **Physics (Chapter 12)** **Class: Second Year** **Total Marks=40**

Name of Student: _____

Question No. 1. Encircle the correct option. **(20)**

i. If a charge body is moved against the electric field, it will gain
 a. P.E. b. energy c. K.E. d. mechanical energy
ii. The word "Xerography" means
 a. to take photo graph b. dry writing c. writing by machine d. to point something
iii. The S.I. units of flux is
 a. $N\,m^2\,C^{-1}$ b. $N\,m\,C^{-1}$ c. $N\,m^2\,C$ d. $N\,m^{-2}\,C^{-1}$
iv. When area is held perpendicular to the field lines, then the magnitude of electric flux is
 a. maximum b. minimum c. negative d. Either maxi. or mini.
v. Photo copier and inkjet printer are the applications of
 a. electronics b. electricity c. magnetism d. electrostatics
vi. If distance between two charges is doubled then force between them becomes
 a. double b. remains same c. half d. one by fourth
vii. The expression of energy stored in a capacitor is give by
 a. CV^2 b. $\frac{1}{2}\,CV^2$ c. $\frac{1}{2}\,C^2V$ d. $\frac{1}{2}\,C^2V^2$
viii. The potential gradient is defined as
 a. $\Delta E/\Delta V$ b. $-\Delta V/\Delta E$ c. $-\Delta V/\Delta r$ d. $-\Delta r/\Delta V$
ix. The value of relative permittivity for all the dielectrics other than air or vacuum is always
 a. one b. greater than one c. less than one d. zero
x. Farad is defined as
 a. C/V b. V/C c. A/V d. J/C
xi. The capacitance of a capacitor, when dielectric is placed b/w its plates, increases due to
 a. rectification b. polarization c. magnification d. increase in electric field
xii. The force experience by unit positive charge placed at a point in an electric field is called
 a. Coulomb's force b. Faraday's force c. Lorentz force d. Electric field intensity
xiii. Presence of dielectric always
 a. increases electrostatics force b. decreases electrostatics force
 c. does not effect electrostatics force d. double the electrostatics force
xiv. The S.I. units of relative permittivity is
 a. $N\,m^2\,/C^2$ b. $N\,m\,/C^2$ c. $N\,m^2\,/C$ d. No unit
xv. The time constant of a capacitor is time taken by it to discharge to
 a. 63% b. 67% c. 37% d. 70%
xvi. A charge of 0.20 C is accelerated through a P.D of 100 volt gains K.E equal to
 a. 200 J b. 20 J c. 2 J d. 0.2 J
xvii. Both electric and gravitational forces obey
 a. ohm's law b. coulomb's law c. inverse square law d. Faraday's law
xviii. Capacitance of parallel plate capacitor does not depend upon
 a. separation of plates b. area of plates c. medium between plates d. material of plates
xix. Two capacitors having capacitance 4 µF each connected in series. Their equivalent capacitance is equal to
 a. 18 µF b. 4 µF c. 2 µF d. 0.5 µF
xx. When amount of charges on the sheet increases then electric intensity
 a. increases b. decreases c. remains constant d. becomes zero

Question No. 2 Write the short of any six questions. **2x6=12**

i. Is electron volt (eV) unit of potential difference or energy? Explain.

ii. If a point charge q of mass m is released in a non uniform electric field with field lines pointing in the same direction, will it make a rectilinear motion?

iii. Describe a force or forces on a positive pint charge placed between parallel plates with similar and equal charges and with opposite and equal charges.

iv. State Gauss's law and give its mathematical form.

v. Give three characteristics of electric lines of force.

vi. Show that S.I. unit of electric field can be expressed as $V\,m^{-1}$.

vii. State Coulomb's law and give it mathematical form.

viii. Electric lines of force never cross. Why?

Question No. 3 a. Define and explain electric potential at a point due to a point charge. Calculate expression for it. **(5)**
b. Determine electric filed at **r** = (4**i**+3**j**) m caused by a point charge q = 5.0×10^{-6} C placed at origin. **(3)**

OR

Question No. 4 a. What is a capacitor? Derive an expression for the capacitance of a parallel plate capacitor. **(5)**
b. Two point charges $q_1 = -1.0 \times 10^{-6}$ C and $q_2 = 4.0 \times 10^{-6}$ C are separated by a distance of 3 m. Find zero filed location. **(3)**