

PHY 202 Test 2 Preparation

Spring semester, 2004

The purpose of this assignment is to help you prepare for the Test 2. Fill in the appropriate laws or definitions; all variables must be defined somewhere in review sheet; draw a picture when appropriate (♣). Bring the completed assignment with you for use during the exam, and hand it in with your test: it will count as part of your test grade. Do not include any “extra” information on this assignment.

- Vector definitions

- the gradient operator $\nabla =$
- Cross product (for combinations of \hat{i} , \hat{j} , and \hat{k}).

- electric flux $\Phi_{\mathbf{E}}$ ♣

- Force of \mathbf{E} and \mathbf{B} fields on charged particles

- Lorenz force law (definition of \mathbf{E} and \mathbf{B})

- motion of particle in a circle (vector form) and centripetal acceleration

- electric dipole moment

- * definition ♣

- * torque

- * energy

- Relation between V and \mathbf{E} :
 - integral form ♣
 - derivative form
- Charge/current conservation
 - definition of current (give units) ♣
 - law in sentence form
 - law in terms of ρ and \mathbf{J}
- Gauß' law. ♣
- Superposition principle:
- Symmetries of \mathbf{E} and V :
- Charges produce electric fields
 - Coulomb's law (comes from Gauß' law) ♣
 - rule for direction of \mathbf{F} :
 - \mathbf{E} of point charge (from Coulomb's law) ♣
 - \mathbf{E} at the surface of a conductor
 - \mathbf{E} in the interior of a conductor

- Circuits

- definition of resistance (Ohm's law) ♣

- definition of electric power

- Kirchoff's 2 laws (note the associated conservation laws)

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- definition of capacitance ♣

- energy of a capacitor