Energy Matters HW2

1.

(a) move the coil across the magnet
or
move the magnet past the coil

(b) Turn the magnet around so that the North and South poles swap places.

(c) (i) The induced voltage would be larger.
(ii) The induced voltage would decrease.

(d) You could obtain a larger voltage by increasing the speed of the moving coil/magnet.

2. (i) No
(ii) No
(iii) Yes
(iv) Yes
(v) No
(vi) No

3. (i) No
(ii) Yes
(iii) No
(iv) Yes

4. (1) yes
(2) yes
(3) no
(4) yes

5. (i) rotor - 6
(ii) stator - 9
(iii) brushes – 16

6. (a)

The rotor turns the cylindrical magnet around inside the soft iron core. The changing magnetic field induces a current in the stator coil. The effect is increased by the presence of the ferromagnetic soft iron core.

(b) Any 3 from this list:

A bicycle dynamo uses a permanent bar magnet while the power station uses an electromagnet.

The coils in the alternator rotor are wound to create several alternating North and South poles. The dynamo has just one set of poles.

There are many sets of stator coils in a power station alternator while a dynamo has just one stator coil.

Alternators produce a lot of heat and require cooling, dynamos do not.