Test 1

A. Comprehension Exercises

Put "T" for true and "F" for false statements. Justify your answers.

…….1. With his atomic theory, Bohr contributed to the understanding of the magnetic behavior of materials.
…….2. The atoms of a substance, if placed in a magnetic field, are subject to a torque.
…….3. Platinum is a diamagnetic material.
…….4. In ferromagnetic materials, the magnetic moments of large groups
…….5. In an unagnetized ferromagnetic material, the domains are aligned in different direction.
…….6. The magnetic properties of iron increase with an increase in temperature.

B. Language Practice

Choose a, b, c, or d which best completes each item.

1. Copper is ..... material, therefore, it exhibits a relative permeability slightly less than unity.
a. a paramagnetic b. a diamagnetic
c. a permeable d. a neutral

2. Iron provides a great penetration of the magnetic field, that is ,its ..... is many times greater than that of free space.
a. magnetic flux b. atomic composition
c. relative permeability d. magnetic moment

3. Elements and metals which have slight magnetic properties are called ..... materials.
a. magnetic b. metallic
c. diamagnetic d. paramagnetic

4. Iron and some of its alloys have an appreciable magnetic permeability. These materials are called ..... .
a. ferromagnetic b. diamagnetic
c. paramagnetic d. magnetic

5. The state of ..... is reached when all the magnetic domains are aligned in one direction.
a. magnetization b. saturation
c. flux density d. neutralization

C. Choose a, b, c, or d which best completes each item.

1. In steam power stations, the turbine efficiency will increase if ..... .
a. the steam pressure is kept constant
b. the outlet steam is condensed into water
c. the steam temperature is not varied
d. the outlet water is pumped back into the boilers

2. The steam power station uses pure water ..... .
a. to produce the steam required to drive the turbines
b. to produce the steam required to activate the generators
c. to create the vacuum space necessary for the system
d. to create the pressure and temperature needed

3. The heat of the steam is removed by ..... the condenser.
a. the recirculation of cold pure water in
b. the flow of natural air in one side of
c. the recirculation of the steam in
d. the flow of cold water through one side of

4. Prior to recirculation, impure water must be cooled ..... .
a. in broad concrete structures
b. in broad metal chimneys
c. at the bottom of the tower
d. at the top of the tower

5. The cooling factor in a cooling tower is ..... the tower.
a. the pond under
b. the interior of
c. the water inside
d. the air passing through

6. Systems recirculating impure water, compared with those on the coast, …… .
a. decrease the efficiency of the station
b. increase the capital cost of building the station
c. reduce the impure water temperature to the required level
d. both a and b

7. The first paragraph mainly discusses ..... .
a. the structure of a condenser compared with that of a cooling tower
b. the mechanism of the steam power station
c. the main sources of energy which account for electricity
d. the cooling water as a deciding factor in the choice of sites for coal, oil, and nuclear plants

D. Translate the following passage into Persian.

Magnetohydrodynamic (MHD) Generation

In conventional power generation, fuel such as oil or coal is burned. The burning fuel heats boilers to produce steam. The steam is used to drive turbo-alternators. The MHD process generates electricity without requiring a boiler or a turbine.

MHD generation works on the principle that when a conductor cuts a Magnetic field, a current flows through the conductor. In MHD generation the conductor is an ionized gas. Small amounts of metal are added to the gas to improve its conductivity. This is called seeding the gas. The seeded gas is then pumped at a high temperature and pressure through a strong magnetic field. The electrons in the gas are collected at an electrode. This movement of electrons constitutes a current flow. Two methods of MHD generation can be used: the open-cycle and the closed-cycle. In the open-cycle method the hot gas is discharged. In the closed-cycle method it is recirculated.

The open-cycle method uses gas from burning coal or oil. The gas is seeded and then passed through a magnetic field to generate current. The seeding elements are recovered and the gas can then be used to drive a turbine before being allowed to escape. The closed-cycle method uses an inert gas, such as helium, which is heated indirectly. The gas is circulated continually through the MHD generator. MHD generation is still in its early stages but already an efficiency rate of 60% has been reached. This compares with a maximum of 40% from conventional power stations.