Master 1 ENERG.

Correction Examen Anglais Tech., Master 1 Energ. 13/01/2018.

1) - According to axis position, there are two types: vertical and horiz. wind turbine.

2) The total enthalpy change presents the specific work.

3) Bacteria, is the biological element responsible of fermentation process

4) The palm trees are attractive resource for bio-ethanol production.

5) The bioethanol is CO_2 neutral, because plants consume CO_2

6) Wind Turbine is un-shrouded turbine.

7) Yes, It is possible to operate gasoline car by pure ethanol by using special internal combustion engine.

8) Acid rain is formed by chemical reaction of sulfuric oxide, gas with water vapeur in atmosphere to give sulfuric acid.

9) The solar chimney is formed by three main components: solar collector, chimney tower, air turbine.

10) During the day, heat is stored in water reservoirs, then, in the night this heat is released to heat air.

11) The main components of water pumping are: Photovoltaic panel, Energy conditionner, submersible pump and water ton

12) PV water pumping systems require little maintenance, because they need only PV modules cleaning.

13) H_2O, N_2 and O_2 gas can be found in car exhaust pipe.

14) Platinium is the noble metal used in PEM fuel cells electrodes.

Exercise: 1) current intensity $I = \frac{P}{V} = \frac{60000}{12} = 5000$ A

$\dot{m}_{O_2} = \frac{I}{4F} = 5000 \times \frac{1}{4 \times 96485} \times 32 = 0,414$ Kg/s

$\dot{m}_{H_2O} = \frac{I}{2F} = 5000 \times \frac{1}{2 \times 96485} \times 18 = 0,466$ Kg/s

2) Sweep Area $= \pi \times r^2 = 3,14 \times (20)^2 = 1256$ m^2

Power $= \frac{1}{2} C_p \times A \cdot v^3 = \frac{1}{2} \times 0,4 \times 1256 (5)^3 = 38622$ W