**Energy Conservation**

1. In a typical wastewater treatment plant what process accounts for the most electrical consumption?
2. Pumping
3. Aeration
4. Dewatering
5. Lighting
6. Energy consumption at WWTPs can be reduced through converting from standard to energy efficient equipment. Which of the following is a common installed energy efficient technology
7. Automated dissolved oxygen control systems
8. Convert from coarse bubble to fine bubble aeration
9. Adjustable speed drives for blowers
10. All of the above
11. Energy-efficient motors, also called premium or high- efficiency motors, are 2 to 8% more efficient than standard motors and can play a major role in reducing facility operating costs.
12. True
13. False
14. Given the following data, evaluate the kilowatt savings of switching out a 50 HP blower motor with an efficiency of 87% for a 50 HP blower motor with an efficiency of 93%

Old 50 HP Blower Motor New 50 HP Motor

Efficiency = 87% Efficiency 93%

1 HP =.746 kW

1. 1.3
2. 2.7
3. 4.1
4. 4.2
5. Given the following data what would be the annual savings of switching out the same 50 HP blower motor with an efficiency of 87% for a 50 HP blower motor with an efficiency of 93% as referenced in question number 4.

Old 50 HP Blower Motor New 50 HP Motor

Efficiency = 87% Efficiency 93%

1 HP =.746 kW

Duty Cycle = 22 hrs/Day \* 365 days

kWh charge = $0.082/kWh

kW Demand charge = $8.00/kW –

Demand Savings = kW \* $8.00 \* 12 Months

1. $62.50
2. $259
3. $1179
4. $2,037

**Energy Conservation- Key**

1. B
2. D
3. A
4. B
5. D

4. Given the following data, evaluate the kilowatt savings of switching out a 50 HP blower motor

with an efficiency of 87% for a 50 HP blower motor with an efficiency of 93%

Old 50 HP Blower Motor New 50 HP Motor

Efficiency = 87% Efficiency 93%

1 HP =.746 kW

(50 HP X .746 kW) ÷ efficiency = 37.3 ÷ .87 = 42.8 kW

(50 HP X .746 kW) ÷ efficiency = 37.3 ÷ .93 = 40.1 kW

42.8 – 40.1 = 2.7 kW Savings

5. Given the following data what would be the annual savings switching out the same 50 HP

blower motor with an efficiency of 87% for a 50 HP blower motor with an efficiency of 93%

as referenced in question number 4.

Old 50 HP Blower Motor New 50 HP Motor

Efficiency = 87% Efficiency 93%

Duty Cycle = 22 hrs/Day \* 365 days

kWh charge = $0.082/kWh

kW charge = $8.00/kW

1 HP =.746 kW

Demand Savings = kW \* $8.00 \* 12 Months

Demand Savings:2.7 kW \* $8.00 \* 12 Months = $259

kWh Consumption Savings:

2.7 kWh \* 22 hrs/Day \* 365 = 21,681 kWh/yr

21,681 \* $0.082 = $1778

Total Annual Electric Savings:

$1778 + $259 = $2,037