Construction and Industry

Certified-Energy-Auditor
Certified Energy Auditor (CEA) exam

Questions And Answers PDF Format:

For More Information – Visit link below:
https://www.certsgrade.com/

Version = **Product**

Latest Version: 7.0

Question: 1

A natural gas fired boiler operates with a combustion air inlet temperature of 80 OF and the flue gas is at 730 OF with 3% flue gas oxygen. It is proposed that an economizer be installed to reduce the flue gas temperature to 630 OF. The annual gas consumption of the boiler is 7,000 Mcf and gas costs S8.00/Mcf. What are the expected fuel cost savings by installing the economizer?

A. $1,825/year
B. $1,650/year
C. $1,400 [year
D. $2,030/year

Answer: C

Explanation:

The stack temperature rise is 730 °F – 80 °F = 650 °F. A combustion efficiency chart for natural gas shows that at 3% flue gas oxygen the efficiency is 78%. When the flue gas temperature is decreased to 630 °F, the stack temperature rise is reduced to 550 °F and the efficiency is 80%. The percent in fuel savings is calculated by:

$$Fuel\ Savings = \frac{New\ Efficiency - Old\ Efficiency}{New\ Efficiency} = \frac{80 - 78}{80} = 2.5\%$$

Therefore, the savings are 2.5% × 7,000 Mcf/year = 175 Mcf/year and 175 Mcf/year × $8.00 = $1,400/year in fuel cost savings.

Question: 2

Why does a supply air reset control strategy save energy?

A. The ventilation system fans are slowed down using VFDs when the pressure in the system is too high
B. The amount of outside air supplied to rooms is adjusted depending upon the outside air temperature
C. When a building is unoccupied the heating set point is allowed to decrease or the cooling set point can increase
D. The supply air temperature is allowed to increase in order to minimize the amount of reheat required

Answer: D

Explanation:
A supply air reset strategy' is employed when the supply air temperature is significantly different to the room set point temperature and a lot of reheat is required. Static pressure reset is

used to reduce fan energy consumption; an economizer optimizes the mixed air temperature by adjusting the amount of outside air supplied; and an unoccupied setback strategy adjusts the setpoint when the building is unoccupied.

Question: 3

An energy audit of a facility found that a dual-fuel boiler was using #2 fuel oil and its efficiency was determined by combustion analysis to be 75%. It is proposed that the boiler start using natural gas and be tuned to improve its efficiency to 80%. What are the expected cost savings in S/MMBtu if the price of #2 fuel oil is S2.OO/gallon and the price of natural gas is S7.20/Mcf? (1 Mcf = Btu)

A. $9.09
B. $10.37
C. $11.95
D. $12.44

Answer: B

Explanation:
The price of #2 fuel oil per Btu is:

$$\frac{\$2.00}{\text{gallon}} \times \frac{1 \text{ gallon}}{140{,}000 \text{ Btu}} \times \frac{1{,}000{,}000 \text{ Btu}}{\text{MMBtu}} \times \frac{1}{0.75} = \frac{\$19.05}{\text{MMBtu}}$$

The price of natural gas per Btu is:

$$\frac{\$7.20}{\text{Mcf}} \times \frac{1 \text{ Mcf}}{1{,}037{,}000 \text{ Btu}} \times \frac{1{,}000{,}000 \text{ Btu}}{1 \text{ MMBtu}} \times \frac{1}{0.80} = \frac{\$8.68}{\text{MMBtu}}$$

The savings are therefore $19.05 – $8.68 = $10.37/MMBtu.

Question: 4

To determine the feasibility of a renewable energy system, which of the following factors is least relevant?

A. Availability of renewable resources
B. The demand for energy in the facility matching the energy' production from a renewable system
C. Current and future utility energy costs
D. The Energy' Use Index of the facility

Answer: D

Explanation:
The technical and financial feasibility of a renewable energy system will depend upon the availability of renewable resources, the demand for energy in a facility matching the renewable energy production, and the cost of the energy the renewable system will be offsetting. Any facility

can be a good candidate for a renewable energy system whether is has a high EU! or low EUI because renewable energy is not an energy efficiency measure; it provides an alternative source of energy to reduce the reliance on utility sources of energy that have greater environmental impacts and helps improve the security of the energy supply.

Question: 5

The relationship between electrical energy consumption and peak electrical demand for a given period is called:

A. the demand charge.
B. the power factor.
C. the Energy Use Index.
D. the load factor.

Answer: D

Explanation:
A buildings load factor is an indicator of the shape of the daily demand profile. A high load factor indicates a relatively high base load compared to the peak whereas a low load factor indicates that there is a period with a high peak load relative to other times in the day.

Question: 6

What is the rate of heat loss due to infiltration if 40 OF outside air enters a building at a rate of 100 cubic feet per minute that is maintained at 70 OF?

A. 2,340 Btu/h
B. 3,020 Btu/h
C. 3,240 Btu/h
D. 320 Btu/h

Answer: C

Explanation:
The rate of heat loss as a result of infiltration is calculated by:

$$Q = 1.08 \times flowrate(\text{cfm}) \times \Delta T = 1.08 \times 100 \times 30 = 3{,}240 \text{ Btu/h}$$

Question: 7

What are the units of illuminance used to measure light output?

A. candela
B. lumens/Watt

C. lux
D. lumens

Answer: C

Explanation:

Illuminance is measured either in units of lux, which are equal to 1 lumen/m^2, or footcandles, which are equal to 10.764 lux.

Question: 8

A 5-ton heat pump has a SEER of 20 and an HSPF of 13. It operates at full-load cooling for 2,800 hours and at full-load heating for 1,300 hours each year. How many kilowatt-hours does the heat pump use each year?

A. 8,500kWh
B. 12,600 kWh
C. 14,400 kWh
D. 10,200 kWh

Answer: C

Explanation:

The efficiency of a heat pump is determined by:

$$\frac{kW}{ton} = \frac{12}{SEER} = \frac{12}{HSPF}$$

So, the energy demand for cooling is:

$$\frac{\text{ton} \times 12}{SEER} \times \text{hours} = \frac{5 \times 12}{20} \times 2{,}800 = 8{,}400 \text{ kWh}$$

And the energy demand for heating is:

$$\frac{\text{ton} \times 12}{HSPF} \times \text{hours} = \frac{5 \times 12}{13} \times 1{,}300 = 6{,}000 \text{ kWh}$$

Therefore, the total energy demand is 14,400 kWh.

Question: 9

Which of the following tasks is not typically an application for computer simulation when assessing building energy performance?

A. Determining the impact on building energy performance of various design options during the early stages of building design
B. Identifying energy efficiency opportunities after a building walk-through survey

C. Analyzing the impact on energy performance of energy" efficiency retrofit options
D. Measurement and verification of energy savings produced by energy conservation measures installed during a building retrofit

Answer: B

Explanation:
Computer simulation is typically a costly and time-intensive process that can produce a reasonably accurate approximate model of building energy performance. It is used to assess the impact of design options, potential retrofit energy efficient measures, and determine the actual energy savings produced by retrofit measures through measurement and verification. It is unlikely that a computer simulation of a building would be created after a building walk-through survey because the data needed to produce an accurate model would require more detailed data collection than can be achieved with a quick walk-through survey.

Question: 10

Which of the following statements regarding the Net Present Value (NPV) of a Project is not true?

A. The NPV is used in Life Cycle Cost analysis
B. It is not possible to compare the NPV's of different projects to help determine which will provide the best return on investment
C. The NPV is affected by the choice of discount rate used in the analysis
D. The accuracy of the NPV is affected by the uncertainty of future costs

Answer: B

Explanation:
The Net Present value is a useful measure to compare mutually exclusive projects. A project with a higher NPV will provide a better return on investment.

Question: 11

Which of the following systems is not suitable for heat recovery in a mechanical ventilation system?

A. A heat wheel
B. An economizer
C. A heat pipe
D. A run-around coil

Answer:

Explanation:
An airside economizer does not capture waste heat from the exhaust air to pre-heat or pre-cool the supply air. An airside economizer enables cooling to occur without operating the

compressor and chilled water pumps by monitoring the conditions of the outside air. The other systems listed all extract heat energy from the exhaust air to pre-condition the outside air supply.

Question: 12

The HVAC system in a building was recommissioned at a cost of $18,000 and produced annual savings of $5,700. What is the minimum amount of time the savings need to persist if the building owner uses a discount rate of 10%?

A. 3 years
B. 4 years
C. 5 years
D. 6 years

Answer: B

Explanation:

The present worth of the annual savings should be larger than the cost of recommissioning. Therefore, the compound interest factor $(P/A)_{10,n}$ should be larger than $18,000/$5,700 = 3.1579. The interest factor for year 4 is 3.1699, which is the closest interest factor greater than 3.1579 and the present worth of the savings would be $5,700 × 3.1699 = $18,068.

For More Information – Visit link below:

https://www.certsgrade.com/

PRODUCT FEATURES

- 100% Money Back Guarantee
- 90 Days Free updates
- Special Discounts on Bulk Orders
- Guaranteed Success
- 50,000 Satisfied Customers
- 100% Secure Shopping
- Privacy Policy
- Refund Policy

16 USD Discount Coupon Code: NB4XKTMZ