

Construction and Industry

Certified-Energy-Auditor

Certified Energy Auditor (CEA) exam

Questions And Answers PDF Format:

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Question: 1

The lumen depreciation factor of a lighting system is 0.85 and the dirt depreciation factor is 0.8. What is the overall light loss factor?

- A. 0.85
- B. 0.68
- C. 1.65
- D. 0.80

Answer: B

Explanation:

The overall light loss factor for a lighting system is the product of the individual light loss factors. In this case the light loss factor is $0.8 \times 0.85 = 0.68$.

Question: 2

Which terminal unit cannot provide ventilation to meet minimum fresh air flow rates?

- A. Unit ventilator
- B. VAV box
- C. Induction system
- D. Fan Coil Unit

Answer: D

Explanation:

A Fan Coil Unit is a terminal box with a heating and/or cooling coil, a fan, and a filter. It uses 100% return air to condition a space. Fresh air to the space is provided by a separate system.

Question: 3

Which explanation most accurately describes an optimal start HVAC control strategy?

- A. HVAC equipment is started in stages to minimize peak demand charges
- B. Outside air is used to pretreat the building in the morning before it is occupied after night set-back
- C. Operation of HVAC equipment is delayed to the shortest time possible to condition the building before it is occupied based on outdoor and indoor air temperatures
- D. Outside air is shut off during the start-up of a building

Answer: C

Explanation:

An optimal start HVAC control strategy saves energy by reducing system run time. Instead of starting HVAC equipment at a scheduled time, the equipment start can be delayed when the outside air temperature is close to the desired indoor air temperature because it will take less time to condition the indoor air.

Question: 4

An electricity rate structure charged by a utility that varies for different hours of the day is called a:

- A. Demand ratchet
- B. Demand charge
- C. Time of use rate
- D. Tiered rate

Answer: C

Explanation:

A time of use rate is an electrical rate structure that will have at least two different rates during a day, for example an on- peak rate from 7 pm to 12 am and an off-peak rate from 12 am to 7 pm.

Question: 5

Which of the following is a potential application for an infrared camera?

- A. Finding faulty electrical connections or overloaded circuits.
- B. Determining areas of heat loss from a building.
- C. Identifying mechanical faults such as excessive bearing friction
- D. All of the above

Answer: D

Explanation:

Infrared thermography can be utilized to find excessively hot or cold areas in electrical systems, mechanical equipment, and the building fabric.

Question: 6

What would be the best purpose of an anemometer during an energy audit?

- A. Measure the wet bulb temperature
- B. Measure the air pressure in a supply air duct
- C. Measure the humidity in the outside air supply

D. Measure the air velocity from a vent

Answer: D

Explanation:

An anemometer measures air velocity. They may operate by means of a rotating vane, deflecting vane, hot wires, ultrasonic sound waves, plate, or pitot tube.

Question: 7

Which of the following economic analysis methods does not consider the time value of money?

- A. Simple Payback Period
- B. Present Worth Analysis
- C. Life Cycle Cost
- D. Benefit Cost Ratio

Answer: A

Explanation:

Simple Payback Period is calculated by dividing the initial costs by the annual savings and does not consider how costs or the value of money changes over time.

Question: 8

Which of the following systems would be most suitable to have measurements taken with a bourdon gauge?

- A. Lighting
- B. Electrical supply
- C. Building envelope
- D. Boiler

Answer: D

Explanation:

A bourdon gauge is a mechanical pressure measurement device. They are often installed in boiler systems to measure the pressure in steam or hot water pipes.

Question: 9

When a capacitor bank is added to an electrical system with a lagging current, the power factor is increased because

- A. total reactive power is increased.

- B. total reactive power is decreased.
- C. total real power is increased.
- D. total real power is decreased.

Answer: B

Explanation:

A lagging current is a result of inductive loads, which increase the reactive power to produce the magnetizing field required for their operation. Capacitor banks draw a current that leads the voltage and can therefore decrease the total reactive power that must be supplied.

Question: 10

Which of the following does not impact the lighting Coefficient of Utilization?

- A. The color of the walls, ceiling, and floor in an illuminated space.
- B. They type of luminaire used
- C. The dimensions of the illuminated space
- D. The type of lamps used

Answer: D

Explanation:

The type of lamp does not impact the Coefficient of Utilization (Cu). The Cu is a measure of how efficiently light coming out of the lamps contributes to the useful light at the work surface. Useful light is lost when it is trapped in the luminaire or reflected in the wrong direction, and when a space has dark surfaces, which do not reflect light as well as lighter-colored surfaces.

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