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Question: 1

When an infusion pump is set to administer a drug at a high rate of infusion during scheduled, short periods that are separated by longer interval, low-rate infusion, what is this called?

- A. Continuous infusion
- B. Oscillating infusion
- C. Intermittent infusion
- D. Standard infusion

Answer: C

Explanation:

An intermittent infusion uses programmable settings of an infusion pump to administer a drug at a high rate during regular intervals. This mode of pumping is useful for drugs that might irritate the blood vessel through which it is being administered. The infusion continues at a low rate between administrations to assure that the cannula does not close. Thus, the amount of drug infused during the low-rate periods is rather small, so the infusion cannot be called "oscillating." Continuous infusion consists of low-dose pulses over an extended period. No type of infusion is called "standard."

Question: 2

Which of the following choices is NOT an advantage of syringe pumps?

- A. Uses standardized containers
- B. Fine control of infusion
- C. Ideal for long-term infusion
- D. High infusion volumes

Answer: D

Explanation:

Syringe pumps are used for the injection of highly potent medications or slow administration of a drug via mechanical depression of a syringe. The pumps make use of existing syringes with high precision and can be set to provide small doses over time, thus choice D is correct.

Question: 3

Which of the following is NOT mandatory in accordance with the Globally Harmonized

System (GHS)?

- A. Labelling of carcinogenicity in animal testing
- B. Hazard classification of pyrophoric substances
- C. Precedence of safety data sheet (SDS) hazard terminology
- D. Safe handling and storage procedures

Answer: A

Explanation:

The GHS provides several mandatory requirements; however, it also provides some suggested but non-mandatory standards, such as including the carcinogenicity of a substance in animal testing, although labelling human carcinogenicity is mandatory. GHS defines and requires labelling of pyrophoric substances, which are any substances that can ignite within 5 minutes of contact with air. GHS requires that hazard terminology is used consistently, is not mixed, and requires inclusion of safe handling and storage measures in safety data sheets.

Question: 4

The respiratory system_ oxygen and_ carbon dioxide.

- A. inhales; exhales
- B. delivers; expels
- C. creates; absorbs
- D. exhales; inhales

Answer: B

Explanation:

Our respiratory system inhales air, of which oxygen is one component. From that inhaled air, the respiratory system delivers oxygen to the body. Through gas exchange, it then expels carbon dioxide (CO₂) from the body as we exhale. The respiratory system obtains oxygen from the air we inhale; it does not create it, and it expels CO₂ rather than absorbing it (C). We do not use our respiratory systems to exhale oxygen or inhale CO₂ (D).

Question: 5

Which of the following phrases best describes root cause analysis?

- A. An interrogative process to determine where in the task chain the failure happened and determine how to prevent a repeat occurrence
- B. A series of iterative questions to determine the underlying cause of failure and develop a solution from that
- C. A set of methods used to improve quality and reduce the chance of errors occurring
- D. A means of identifying the most cost-efficient solution to an ongoing problem

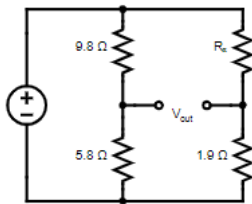
Answer: B

Explanation:

Root cause analysis is used to seek out the underlying cause of failure, not the apparent causative action or where the problem occurred and then determine a solution for the underlying problem. Although root cause analysis is able to improve quality through solutions developed, failure prevention is the objective. Root cause analysis is not directly focused on cost reduction.

Question: 6

For the following circuit, what is the missing resistance that will balance the bridge?



- A. 2.6
- B. 7.4
- C. 3.2
- D. 9.8

Answer: C

Explanation:

The missing resistance can be found by the proportion of known resistances:

$$\frac{R_1}{R_2} = \frac{R_x}{R_3}$$

Rearranging the equation to solve for R_x gives:

$$R_x = \frac{R_1}{R_2} \times R_3$$

Substituting the appropriate values gives the value of R_x , 3.2 Ω:

$$R_x = \frac{9.8 \, \Omega}{5.8 \, \Omega} \times 1.9 \, \Omega = 3.2 \, \Omega$$

Question: 7

Which statement MOST accurately describes the main action and purpose of a capnograph?

- A. Exhaled carbon dioxide is measured by infrared absorption and is used as a measure of patient respiratory health.
- B. Inhaled oxygen levels are analyzed by infrared absorption and are used to prevent damage

from oxygen toxicity.

C. Exhaled carbon dioxide is measured chemically and is mainly used to measure respiration rate.

D. Exhaled gasses are measured by spectrophotometry and are used to identify any abnormal expired gasses,

Answer: A

Explanation:

Capnography specifically measures end-tidal carbon dioxide as an indicator of the patient's respiratory health and can identify signs of hypoxia. High oxygen levels are mainly measured for infants to prevent damaging oxygen toxicity. Respiration rate is a vital sign measured by ventilators and other equipment but not capnographs. Similarly, gasses other than carbon dioxide are not a focus of capnography.

Question: 8

Which of the following approximates the reactance of a 40 millihenry inductor exposed to a 60.0 Hz current?

A. 13 Ω

B. 15 Ω

C. 24 Ω

D. 35 Ω

Answer: B

Explanation:

The reactance of an inductor is related to the frequency of an applied current by the following equation:

$$X_L = \omega L$$

where X_L is the reactance of the inductor, ω is angular frequency ($2\pi f$, or the cycle of the current as radians per second), and L is the inductance. For the given values, this would be:

$$X_L = 2\pi \times 60.0 \text{ Hz} \times 40 \text{ mH} \times \frac{1 \text{ H}}{1000 \text{ mH}}$$

$$X_L = 2\pi \times \frac{60.0 \times 0.04 \text{ H}}{\text{s}} = 15.1 \Omega \approx 15 \Omega$$

Question: 9

Which of the following statements is FALSE concerning the HITECH Act?

A. The HITECH Act sets guidelines for hospital spending on electronic health records to improve health outcomes.

B. The HITECH Act was created to optimize patient health records by incentivizing the adoption of electronic health records.

- C. The HITECH Act penalizes medical providers who do not implement electronic health records in their practice.
- D. The HITECH Act sets requirements for and defines what constitutes meaningful use of electronic health records.

Answer: A

Explanation:

The HITECH Act was passed in 2009 to increase and promote the increased use of electronic health records (EHRs). The act provides financial incentives and penalties through Medicaid depending on providers' adoption of certified EHRs, and it sets detailed requirements for the use of them. The HITECH Act does not, however, set guidelines on spending outside of its requirements concerning the adoption of EHRs.

Question: 10

Which lead arrangement corresponds to American Hospital Association (AHA) ECG limb lead color coding?

- A. RA white, LA black, RL green, LL red
- B. RA red, LA yellow, RL black, LL green
- C. RA green, LA red, RL black, LL white
- D. RA green, LA white, RL black, LL red

Answer: A

Explanation:

The correct lead color coding used by the AHA is: RA white, LA black, RL green, LL red, with brown chest leads (in a 12-lead ECG). Choice B represents the color coding used by the International Electrotechnical Commission. The other choices are incorrect because they confuse the arrangement of leads.

Question: 11

How much power is used to run a 10.0-amp current through a circuit with a 30.0-ohm resistance?

- A. 1.5 kW
- B. 3.0kW
- C. 7.5kW
- D. 3.3 kW

Answer: B

Explanation:

The power draw of a 10-amp circuit with a 30-ohm resistance can be found by the following relation:

$$P = I^2 R$$

where P is power, I is current, and R is resistance. Because we are given values of 10 amps and 30 ohms, the power is:

$$P = (10 \text{ A})^2 \times 30 \Omega = 100 \text{ A}^2 \times 30 \Omega = 3000 \text{ W} = 3 \text{ kW}$$

Question: 12

Which of the following components is an active circuit component?

- A. A capacitor
- B. An inductor
- C. A thermistor
- D. A transistor

Answer: D

Explanation:

Active circuit components are those that require a power source to electrically control energy flow. A transistor is powered and amplifies a signal, making it an active component. Capacitors, inductors, and thermistors are all passive components that act upon the voltage or current.

Question: 13

Which of the following types of brain waves represents being awake and mentally active?

- A. Alpha
- B. Beta
- C. Delta
- D. Theta

Answer: B

Explanation:

Of the choices, beta waves are the highest frequency waves and correspond to being awake and active. Alpha waves correspond to being awake and resting, whereas delta and theta waves are lower-frequency patterns that correspond to sleep and deep sleep.



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