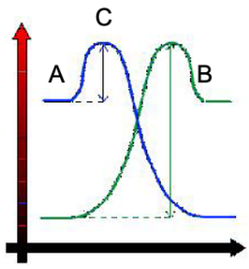
SBI4U: Multiple Choice Exam Practice

1. When organic molecules are joined together and a water molecule is removed, the reaction is called which of the following?
   a. Dehydration synthesis.
   b. Hydrogenation.
   c. Hydrolysis.
   d. Oxidation.

2. Where is epinephrine produced?
   a. Posterior Pituitary
   b. Anterior Pituitary
   c. Adrenal Medulla
   d. Pancreas

3. What is a nucleotide composed of?
   a. Nitrogenous base, 6 carbon sugar and a phosphate group.
   b. Nitrogenous base, 5 carbon sugar and a phosphate group.
   c. Nitrogenous base, 5 carbon sugar and a phosphorus group.
   d. None of the above.

Use the graph to the right to answer the following statement.



4. Graph "A" represents a(n) _____ reaction, while Graph "B" represents a(n) _____ reaction. "C" represents the _____.
   a. A = exothermic; B = endothermic; C = potential energy.
   b. A = endothermic; B = exothermic; C = activation energy.
   c. A = exothermic; B = endothermic; C = activation energy.
   d. A = anabolic; B = hydrolitic; C = entropy.

5. Which of the following statements regarding cellular respiration is **false**?
   a. Pyruvate oxidation occurs in the mitochondrial matrix.
   b. 4 molecules of carbon dioxide are produced during the Krebs cycle per glucose
   c. Substrate-level phosphorylation produces 2 ATP in glycolysis.
   d. Phosphofructokinase is an allosteric enzyme used to control the rate of aerobic respiration.

6. Enzymes work as catalysts by doing which of the following?
   a. Increasing the activation energy.
   b. Decreasing the activation energy.
   c. Bypassing the need for a transition state to occur.
   d. Allosterically controlling other proteins.

7. Which is true regarding NAD+ and FAD+?
   a. NAD+ and FAD+ are oxidized coenzymes.
   b. NAD+ and FAD+ are reduced cofactors.
   c. NAD+ and FAD+ act as proton acceptors.
   d. NAD+ and FAD+ are high energy coenzymes.

8. The brain's Frontal Lobe controls which bodily function?
   a. Vision, hearing, & memory
   b. Movement of voluntary muscles & intellect, personality
   c. Emotions & speech
   d. Touch & temperature awareness

9. Acetyl-CoA is the final product of which stage of cellular respiration?
   a. Glycolysis.
   b. Pyruvate oxidation.
   c. Krebs cycle.
   d. ETC.

10. Which statement regarding the structure of chloroplasts is **false**?
    a. Stacks of thylakoids form a column known as a granum.
    b. Lamellae connect adjacent grana.
    c. The photosynthetic membrane is the inner membrane.
    d. The stroma is a fluid that surrounds the interior of the chloroplast.

11. In urine formation, what does "Reabsorption" mean?
    a. Reabsorption of fluid from blood to Bowman's Capsule
    b. Reabsorption of materials from blood to Nephron
    c. Reabsorption of essential solutes and water from Nephron to blood
    d. Reabsorption of essential solutes and water from blood to Nephron

12. How many turns of the Calvin cycle are required to fix enough carbon dioxide to produce one glucose molecule?
    a. 1
    b. 2
    c. 3
    d. 6

13. Which statement is true regarding CAM photosynthesis?
    a. It involves the stomata opening at night and closing in the day.
    b. It occurs in cool, moist environments.
    c. It uses PEP carboxylase to fix CO_2 in the mesophyll cells.
    d. It occurs in corn and sugar cane.

14. How are nerve impulses transmitted from neuron to neuron?
    a. Acetylcholine released from the pre-synaptic neuron enters the synapse causing sodium channels to open.
    b. Acetylcholine released from the pre-synaptic neuron enters the synapse causing potassium channels to open.
    c. Cholinesterase signals the release of acetylcholine from the presynaptic neuron.
    d. Cholinesterase signals the postsynaptic neuron to accept acetylcholine from the presynaptic neuron.

15. Which two nucleotides are purines?
    a. Adenine and thymine.
    b. Guanine and cytosine.
    c. Thymine and cytosine.
    d. Adenine and guanine.

16. Which mutation occurs if one letter is changed but nothing happens?
    a. Missense
    b. Nonsense
    c. Silent
    d. Frameshift

17. What theory is correct according to the semi-conservative theory of DNA replication?
    a. The replicated DNA contains two new DNA daughter strands, and the parental strand is it's compliment.
    b. The replicated DNA contains one new strand of DNA and the complementary parental strand.
    c. Semi-conservative DNA replication only occurs in eukaryotic cells.
    d. Semi-conservative DNA replication occurs when both strands of parental DNA break into Okazaki fragments and are re-assembled.
    e. The replicated DNA strand is an assortment of new and parental DNA.

18. You accidentally touch a hot element on top of a stove. Why is your reflex arc faster than other nerve responses?
    a. The receptor is connected to the effector by a shorter series of nerve cells.
    b. The receptor is connected to the effector by a longer series of nerve cells.
    c. There are nodes of ranvier along the axon to speed up the impulse.
    d. There is no myelin along the axon to speed up the impulse.

19. Which of the following is **false**?
    a. Spliceosomes remove non-coding regions from DNA.
    b. The addition of an incorrect nucleotide is recognized and corrected by an RNA primer when there is no hydrogen bonding between base pairs.
    c. Prokaryotes may begin translation before the synthesis of mRNA is complete, as both processes take place in the cytoplasm.
    d. DNA polymerase adds nucleotides within a replication fork.

20. Ethanol fermentation results in the production of which products?
    a. 36 ATP, 2 pyruvate & 2 NADH
    b. 2 ATP, 2 ethanol & 2 NADH
    c. 2 ATP, 2 ethanol & 2 NAD+
    d. 36 ATP, 2 ethanol & 2 NAD+
    e. 2 ATP, 2 lactate & 2 NAD+

21. What is the function of DNA helicase?
    a. Breaks hydrogen bonds between bases
    b. Creates phosphodiester bonds between sugar and phosphate groups
    c. Breaks phosphodiester bonds between sugar and phosphate groups
    d. Creates hydrogen bonds between bases
    e. a and c are both correct

22. Based on the light-response curve for C3 plants, the light-compensation point represents:
    a. The irradiance level at which the carbon fixation reactions reach a maximum rate.
    b. A low irradiance level that limits photosynthesis.
    c. The rate at which photosynthetic CO_2 uptake equals the rate of respiratory CO_2 release.
    d. The rate at which photosynthetic CO_2 uptake is less than the rate of respiratory CO_2 release.

23. Which of the following statements is **false** with regards to deamination?
    a. Helps to convert proteins into reactants for aerobic respiration.
    b. Responsible for ammonia production in humans.
    c. The process of removing nitrogen groups from proteins in the liver.
    d. Responsible for lactic acid production in humans.

24. Which of the statements about feedback systems are **correct**?
    I. A negative feedback system tends to decrease the stimulus that causes the effect.
    II. A positive feedback loop is responsible for maintaining blood glucose levels.
    III. An example of how the body uses a negative feedback system is to maintain body temperature through sweating.
    IV. A feedback system requires co-ordination between sensory receptors, the coordination centre and an effector.
    a. I, II
    b. I, II, IV
    c. I, III, IV
    d. I, II, III, IV

25. Type I diabetes is caused by:
    a. Inadequate secretion of insulin from beta cells in the pancreas.
    b. Inadequate secretion of insulin from goblet cells in the pancreas.
    c. The destruction of insulin receptors on cells.
    d. The destruction of ADH producing cells in the pituitary gland.

26. Iodine is added to table salt in many countries:
    a. To reduce the incidence of goiter.
    b. To control calcium levels in the body.
    c. To stimulate the release of PTH.
    d. To prevent osteoporosis by helping bones maintain calcium content.

27. Parasympathetic refers to what?
    a. Involuntary adjusting after stress
    b. Involuntary preparing for stress
    c. Voluntary adjusting to stress
    d. Voluntary preparing for stress

28. Why do action potentials travel in one direction along a neuron?
    a. Repolarization: the closure of sodium channels and the opening of potassium channels along the neuron.
    b. Repolarization: the closure of potassium channels and the opening of sodium channels along the neuron.
    c. Depolarization: the closure of sodium channels and the opening of potassium channels along the neuron.
    d. Depolarization: The closure of potassium channels and the opening of sodium channels along the neuron.