

AP BIOLOGY



QUESTION CATALOGUE

AP Biology

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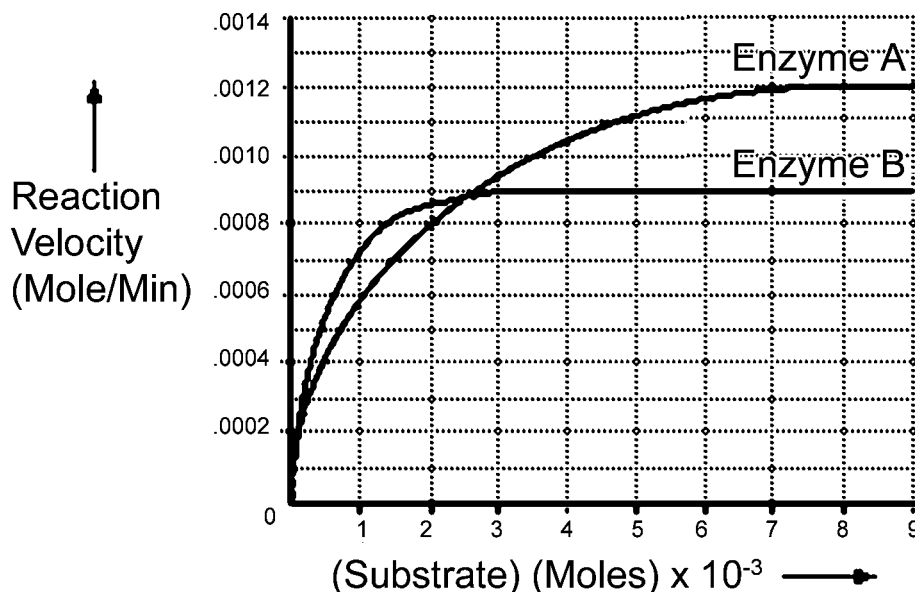
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Base your answers to questions 1254 and 1255 on the graph and information below. The reaction velocity was calculated for a culture containing protease and a constant excess supply of proteins starting from zero moles of substrate and is represented by the line denoting Enzyme A. A second culture was set up under the same conditions, except substance X was added and the results are indicated by the line denoting enzyme B.

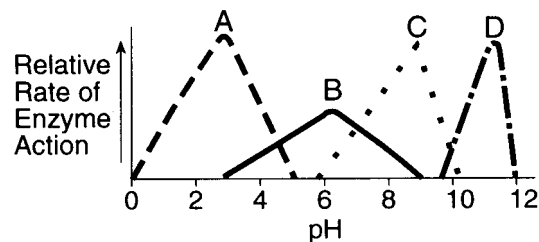


1254. Which of the following best accounts for the shape of the line for Enzyme B from the graph?
- (A) The active site was changed
 - (B) **A competitive inhibitor was introduced into the culture**
 - (C) Substrate was removed from the culture
 - (D) Conformation of the enzyme has changed
 - (E) None of the above
1255. The point at which Enzyme A and Enzyme B have equal amounts of substrate is
- (A) 1.5×10^{-3}
 - (B) 2.0×10^{-3}
 - (C) **2.5×10^{-3}**
 - (D) 3.0×10^{-3}
 - (E) 3.5×10^{-3}

8. How do enzymes effect the reaction rate of chemical reactions?
- (A) **Speed it up**
 - (B) Slow it down
 - (C) Have no effect
 - (D) Reverse the reaction
 - (E) Can either speed it up or slow it down depending on the reaction

92. All of the following statements are true about enzymes, EXCEPT
- (A) These are protein catalysts
 - (B) They lower the amount of activation energy needed for a reaction
 - (C) They bind with the substrate.
 - (D) They resume their original conformation after forming a complex.
 - (E) **They compete with the substrate.**

200. Base your answer to the following question on the graph below.



- Which statement about the graph of enzyme activity is correct?
- (A) All four enzymes can work together at a certain pH.
 - (B) Enzyme D works best at the most acidic pH.
 - (C) **Enzyme D works best at the most alkaline pH.**
 - (D) Enzyme A works best at the most basic pH.
 - (E) Each enzyme works in both acidic and basic conditions.

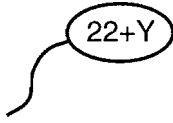
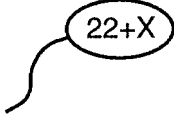
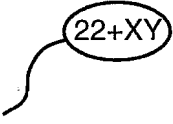
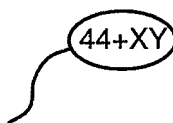
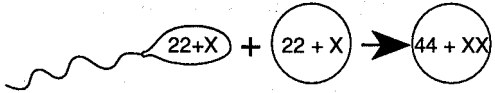
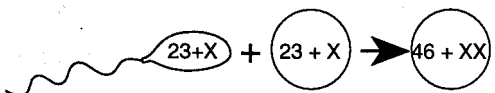
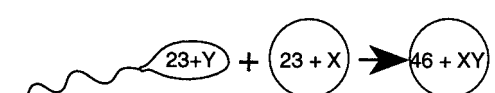
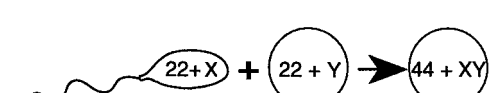
II. HEREDITY AND EVOLUTION

1. Heredity

16. How many different sex cell genotypes can an organism with genotype CcDd produce?
- (A) 1 (D) 8
(B) 2 (E) 16
(C) 4
337. The function of the tail of the sperm is to
- (A) penetrate the egg (D) carry genetic information
(B) **propel the sperm** (E) contain the mitochondria
(C) regulate protein synthesis
436. During the process of oogenesis
- (A) four ova are produced
(B) sperm cells are produced
(C) only one polar body is produced
(D) **only one ovum is produced**
(E) somatic cells are produced
437. The following statements about gametogenesis are all true EXCEPT
- (A) Sperm cells are produced during spermatogenesis
(B) Four sperm cells are produced for each diploid cell.
(C) **Oogenesis produces one ovum and one polar body**
(D) Polar bodies get only a tiny amount of cytoplasm
(E) Gametogenesis occurs in germ cells
495. During what stage of the human life cycle does oogenesis begin?
- (A) **Embryonic development** (D) First menstrual cycle
(B) Birth (E) Fertilization
(C) Puberty
643. Meiosis is involved in which of the following life cycle events?
- (A) **Spermatogenesis** (D) The healing of wounds
(B) Growth (E) Development
(C) Cell regeneration
654. If an organism has the genotype AaBBCCDdee, which of the following gametes cannot be formed via meiosis?
- (A) **ABcDe** (D) ABCde
(B) aBCde (E) aBCDe
(C) aBCDe
727. Sperm cells are the only cells in the human male body that
- (A) **have a flagellum** (D) contain starch
(B) have cilia (E) lack antibodies
(C) have multiple nuclei

A. Meiosis and Gametogenesis

6. Oogenesis/Spermatogenesis

752. A certain species normally contains 40 chromosomes per somatic cell. How many chromosomes does the oocyte contain?
- (A) 10 chromosomes (D) 80 chromosomes
(B) **20 chromosomes** (E) 160 chromosomes
(C) 40 chromosomes
1020. Select the diagram of the sperm that would create a normal male.
- (A)  (D) 
- (B)  (E) Gamete is not shown
- (C) 
1021. Which of the following diagrams accurately represents the process of fertilization in mammals?
- (A) 
- (B) 
- (C) 
- (D) 
- (E) None of the answers accurately represent this process.
1093. Meiosis takes place in which of the following organs?
- (A) **Testes** (D) Stomach
(B) Lungs (E) Skin
(C) Heart

1. Diversity of Organisms

1. Phylogenetics, Systematics, Taxonomy

Base your answers to questions 406 and 407 on the chart below.

Phylum	Germ Layers	Body Symmetry	Gut Openings	Coelom
A		none	0	
B	2	radial	1	
C	3	bilateral	1	acoelomate
D	3	bilateral	2	pseudocoelomate
E	3	radial	2	coelomate

406. Phylum D represents which of the following?

- (A) Platyhelminthes
- (B) Cnidaria
- (C) **Rotifera and Nematode**
- (D) Echinodermata
- (E) Mollusca

407. Which of the following phyla have deuterosome embryonic development?

- (A) A
- (B) B
- (C) C
- (D) D
- (E) **E**

192. Which of the following is a radially symmetrical organism with saclike bodies and mesogleal layers?

- (A) **Ctenophora**
- (B) Aschelminthes
- (C) Arthropoda
- (D) Annelida
- (E) Mollusca

488. The eyes of squids and vertebrates are physically and functionally similar; however, these animals do not share a recent common ancestor. This is an example of

- (A) divergent evolution
- (B) **convergent evolution**
- (C) coevolution
- (D) parallel evolution
- (E) allopatric speciation

627. Base your answer to the following question on the choices below.

- (A) Survival of the fittest
- (B) Acquired characteristics
- (C) Common ancestry
- (D) Reproductive isolation
- (E) Convergence

Independent evolution of similar structures in distantly-related organisms

E

938. Which of the following pairs of organisms are the most closely related taxonomically?

- (A) **Mushrooms and yeast**
- (B) Conifers and ciliates
- (C) Mollusks and ferns
- (D) Bacteria and anthropods
- (E) Algae and echinoderms

923. Phylogenies are useful for scientists because they

- (A) **reconstruct the evolutionary history and common ancestry of various organisms.**
- (B) they are indisputable evidence of past evolutionary patterns.
- (C) calibrate how long ago two similar species diverged.
- (D) measure the number of similarities between organisms.
- (E) are based on morphological characteristics.

1106. Which group is the most different phylogenetically?

- (A) Moss and Pine
- (B) Protozoans and Slime Molds
- (C) Bacteria and Blue-Green Algae
- (D) Bivalves and Cephalopods
- (E) **Agnatha and Angiosperm**

1151. Groups of finches from given populations migrated and began occupying several habitats on the Galapagos Islands. The evolutionary pathway that accounts for the existence of many species of finch on a specific Galapagos Island is

- (A) **adaptive radiation**
- (B) punctuated equilibrium
- (C) genetic drift
- (D) isolation
- (E) convergent evolution

1184. When populations that are completely unrelated resemble each other, this is known as

- (A) directional selection
- (B) stabilizing selection
- (C) divergent evolution
- (D) **convergent evolution**
- (E) speciation

Base your answers to questions 1572 through 1574 on the information below. You design an experiment to test whether environmental tobacco smoke affects the growth and development of lungs. The experiment involves counting septal cells in lungs of mice exposed to tobacco smoke. The data is shown below.

Control Group		Experimental Group	
Slide #	Septa Count	Slide #	Septa Count
1	10	2	5
3	13	4	5
5	12	6	6
Mean = 11.7		Mean = 5.3	

1572. What conclusions can be reached?

- (A) Mice exposed to smoke have more septa than mice not exposed, giving the exposed mice a larger lung surface area to allow for gas exchange.
- (B) Mice exposed to smoke have fewer septa than mice not exposed, giving the exposed mice a larger lung surface area to allow for gas exchange.
- (C) Mice exposed to smoke have more septa than mice not exposed, giving the exposed mice a smaller lung surface area to allow for gas exchange.
- (D) Mice exposed to smoke have fewer septa than mice not exposed, giving the exposed mice a smaller lung surface area to allow for gas exchange.**
- (E) Septa number is not correlated with lung surface area and gas exchange.

1574. What role can you conclude septa play in gas exchange?

- (A) Additional septa decrease lung volume but increasing alveolar size.
- (B) Additional septa increase lung volume, without changing alveolar size.**
- (C) Additional septa decrease lung surface area, not lung volume.
- (D) Additional septa increase lung surface area, not lung volume.
- (E) Additional septa increase lung volume, as well as alveolar size.

1611. If *Daphnia* are placed in a warm environment their body temperature should

- (A) decrease
- (B) increase**
- (C) decrease then increase
- (D) increase then decrease
- (E) remain the same

1612. As the body temperature of cold blooded animals increases, their heart rate

- (A) decreases
- (B) increases**
- (C) decreases then increases
- (D) increases then decreases
- (E) remains the same

1657. What does systolic blood pressure measure?

- (A) Blood pressure maintained by the arterial walls
- (B) Blood pressure generated during relaxation of ventricles
- (C) Blood pressure generated during contraction of ventricles**
- (D) Blood pressure of the heart
- (E) Blood pressure during sleep

1626. The following results were obtained from an experiment with water fleas:

Temperature of Environment (degrees Celcius)	Heartbeat/minute
25	20
45	80

What is the Q_{10} for this experiment?

- (A) 0.5
- (B) 1.0
- (C) 2
- (D) 3**
- (E) 4

1658. Why do people who are physically fit require less time than unfit people to reestablish the resting heart rate following exercise?

- (A) Fit people are better at exercise.
- (B) Fit people breath less often per minute.
- (C) Fit people have a smaller stroke volume.
- (D) Fit people deliver more oxygen to tissues.**
- (E) Fit people have a lower resting heart rate.