



BIOLOGY

BOOKS - KVPY PREVIOUS YEAR

SOLVED PAPER 2018

Example

1. What is the maximum number of oxygen atoms that a molecule of haemoglobin can bind ?

A. 2

B. 4

C. 8

D. 16

Answer:



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2. Bt toxin produced by *Bacillus thuringiensis* does not kill the producer because the toxin is

A. in an inactive protoxin form

B. rapidly secreted outside.

C. inactivated by an antitoxin

D. in unfolded form

Answer:



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3. An angiosperm was identified with its endosperm of $6n$. Assuming that is a self-

pollinating species, which ONE of the following is the correct ploidy of the parent ?

A. $3n$

B. $4n$

C. $6n$

D. $8n$

Answer:



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4. Which ONE of the following statements is TRUE about viruses?

A. All viruses possess a protein coat around its genetic material at all stages of their life cycle.

B. All viruses contain RNA as genetic material

C. All viruses contain DNA as genetic material

D. All viruses replicate only within the host cell.

Answer:



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5. Mitochondrial cristae are infoldings of the

A. outer membrane and they increase the surface area.

B. outer membrane and they decrease the surface area.

C. inner membrane and they increase the surface area.

D. inner membrane and they decrease the surface area.

Answer:



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6. In biological nitrogen fixation the enzyme nitrogenase converts

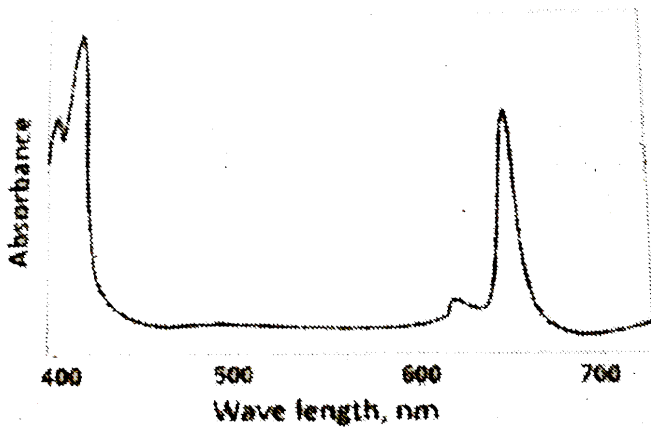
- A. nitrate to nitrite
- B. atmospheric nitrogen to nitrite.
- C. nitrite to ammonia
- D. atmospheric nitrogen to ammonia.

Answer:

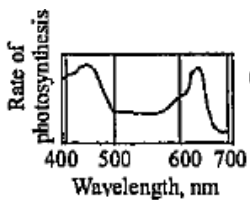


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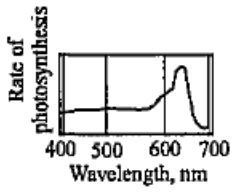
7. The graph below represents the absorption spectrum of major pigment contributing to photosynthesis ?



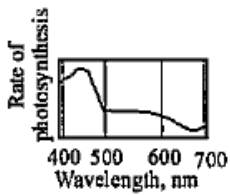
A.



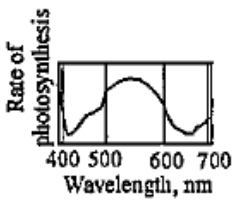
B.



C.



D.



Answer:



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8. ONE of the following properties of normal cell is lost during its transition to cancerous cell ?

- A. Glutamine utilisation
- B. Contact inhibition
- C. Glucose utilisation
- D. Membrane fluidity

Answer:



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9. Which ONE of the following gases is produced during fermentation by yeast ?

A. CO_2

B. O_2

C. H_2

D. N_2

Answer:



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10. Serine proteases are called so because they
?

A. require free serine for their activity

B. cleave after serine residues in the
substrate

C. are inhibited by the presence of their
active site

D. have a serine residue at their active site

Answer:



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11. The maximum number of genotypes of the pollens produced by a tall pea plant with round, yellow seeds of the genotype $TtRrYY$, if the three loci are unlinked, would be :

A. 1

B. 4

C. 2

D. 8

Answer:



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12. ONE of the following statements is TRUE with respect to human ovary ?

A. Oestrogen is secreted by Graafian follicles and progesterone by corpus luteum.

B. Oestrogen is secreted by corpus luteum and progesterone by Graafian follicles.

C. Both oestrogen and progesteron are secreted by Graafian follicles.

D. Both oestrogen and progesteron are secreted by corpus luteum.

Answer:



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13. Which one of the following statements is incorrect with respect to human antibodies?

A. They can neutralise microbes

B. They are synthesised by T cells.

C. They are made up of four polypeptide chains.

D. Milk contains antibodies.

Answer:



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14. Concentration (%) of NaCl isotonic to human blood is

A. 0.085-0.09%

B. 1.7-1.8%

C. 3.4-3.6%

D. 0.85-0.9%

Answer:



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15. Which one of the following statements is true about the Golgi apparatus?

A. It is found only in animals

B. It is found only in prokaryotes.

C. It modifies and targets proteins to the plasma.

D. It is a site for ATP production

Answer:



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16. Creutzfeldt Jakob Disease (CJD) is a transmissible disease caused by a

A. Virus

B. Bacterium

C. Fungus

D. Misfolded protein

Answer:



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17. A researcher found petrified dinosaur faeces. Which ONE of the following is unlikely to be found in this fossil ?

A. Decayed conifer wood

B. Bamboo

C. Cycad

D. Giant fern

Answer:



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18. Which ONE of the pair of amino-acids contains two chiral centres ?

A. Isoleucine and threonine

B. Leucine and valine

C. Valine and isoleucine

D. Threonine and leucine

Answer:



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19. In photosynthetic carbon fixation, which one of the following reacts with CO_2 ?

- A. Phosphoglycolate
- B. 3-Phosphoglycolate
- C. Ribulose-1,5-bisphosphate
- D. Ribose-5-phosphate

Answer:



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20. Match the disease in Column-I with the routes of infection in Column-II. Choose the

CORRECT combination :

Column-I
P. Tuberculosis
Q. Dysentery
R. Filariasis
S. Syphilis

Column-II
i. Contaminated food and water
ii. Inhalation of aerosol
iii. Contact via skin
iv. Sexual intercourse
v. Mosquito bite

A. 2 1 5 4

B. 2 1 3 5

C. 1 3 5 4

D. 2 3 4 5

Answer:



21. What is the probability that a human individual would receive the entire haploid set of chromosomes from his her grandfather ?

A. $\frac{1}{2}$

B. $\left(\frac{1}{2}\right)^{23}$

C. $\left(\frac{1}{2}\right)^2$

D. $\left(\frac{1}{2}\right)^{46}$

Answer:



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22. Which ONE of the following primer pairs would amplify the fragment of DNA given below ?

A. 5'-CTAGTCGTCGAT-3' and 5'-
GACTGAGCTGAGCTG-3'

B. 5'-CTGACTCGACTCGAC-3' and 5'-
CTAGTCGTCGAT-3'

C. 5'-CTAGTCGTCGAT-3'

and

5'CAGCTCAGCTCAGTC-3'

D. 5'-CTAGTCATCGAT-3

and

5'-

GTCGAGTCGAGTCAG-3'

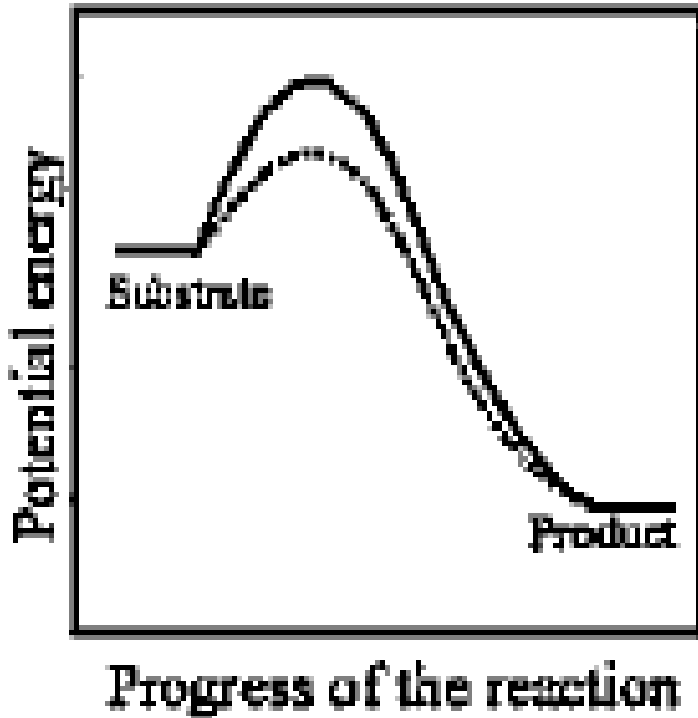
Answer:

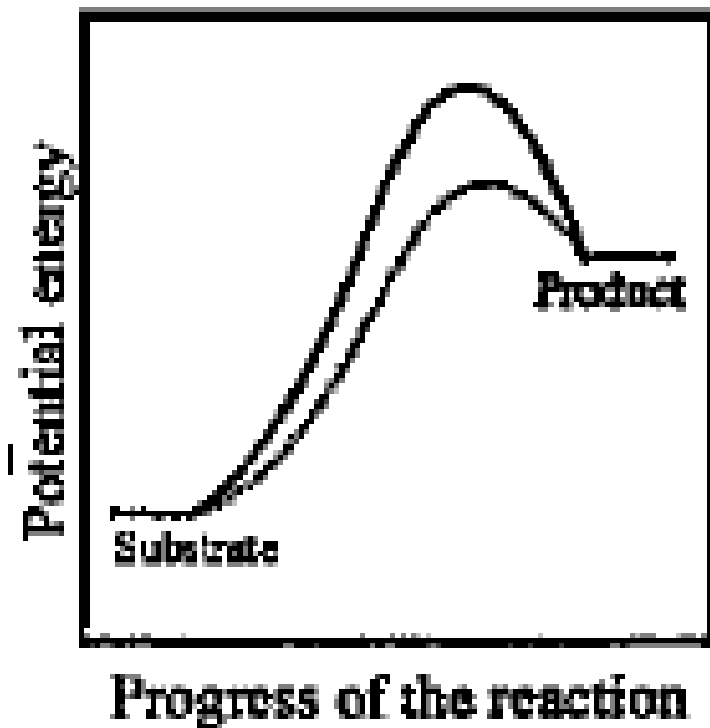


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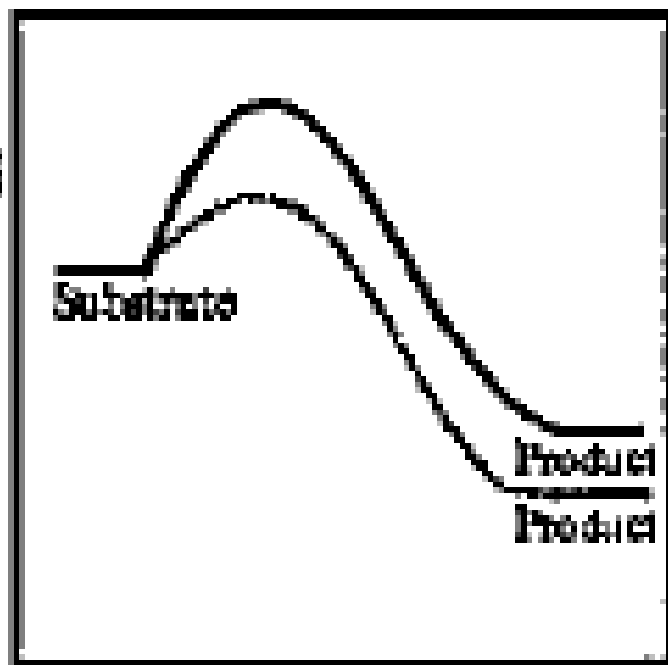
23. The following graphs with the solid and dotted lines correspond to the reactions without and with enzyme, respectively. Which of

the following graph(s) correctly represents the concept of activation energy?

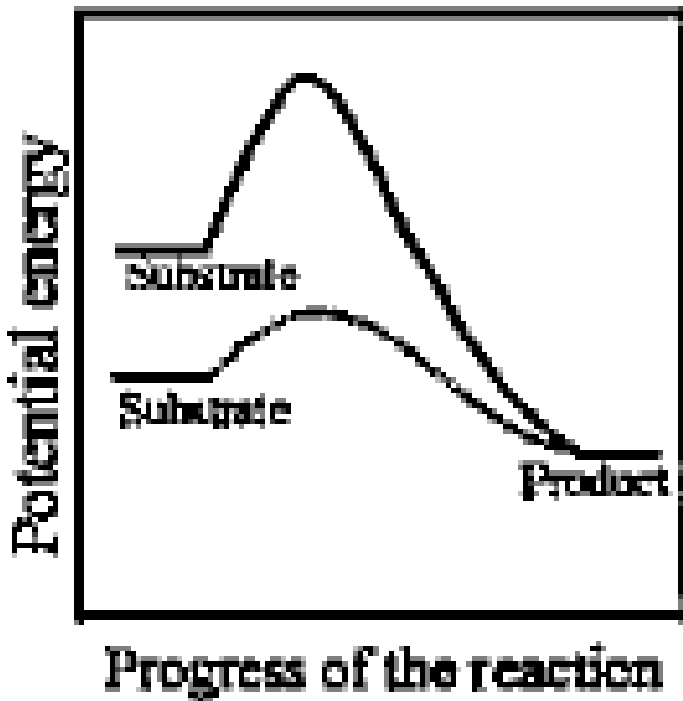




Potential energy



Progress of the reaction



- A. (i) only
- B. (iii) and (iv)
- C. (ii) only
- D. (i) and (ii)

Answer:



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24. A novel species with double stranded genetic material consists of 5 bases namely P, Q, R, S & T with percentages given below

	P	Q	R	S	T
Percentage	22	28	22	12	16

Based on the above information which , ONE of the following inferences is NOT supported by the observations ?

A. S base pairs with T and Q base pairs with

R.

B. S base pairs with Q and T base pairs with

Q.

C. P base pairs with R and S base pairs with

Q.

D. P base pairs with R and T base pairs with

Q.

Answer:



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25. How many different blood groups are possible in a diploid species with ABCD blood grouping system involving I^A , I^B , I^C and I^O alleles (I^O is recessive and others are co-dominant)

A. 4

B. 6

C. 7

D. 8

Answer:



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26. Within the exponential phase of growth , if the initial surface area and the growth rate of a leaf are 10mm^2 and $0.015\text{mm}^2/\text{hour}$ respectively , the area of the leaf after 4 days would range from :

A. 10 to 12mm^2

B. 20to 24mm^2

C. 30 to 36mm^2

D. 40 to 48mm^2

Answer:



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27. If the acidic , basic and hydrophobic residues of proteins are considered to be red , green and blue in color respectively then a globular protein in aqueous solution would have

A. red and blue on the surface and green at the core

B. red and green on the surface and blue at the core

C. blue on the surface and red and green at the core

D. blue and green on the surface and red at the core.

Answer:



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28. A lysosome vesicle of $1\mu m$ diameter has an internal pH of 5.0. The total number of H^+ ions inside this vesicle would range from:

A. 10^3 to 10^4

B. 10^4 to 10^5

C. 10^5 to 10^{10}

D. 10^{10} to 6.023×10^{23}

Answer:



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