



BIOLOGY

BOOKS - KVPY PREVIOUS YEAR

MOCK TEST 1

Exercise

1. The process by which ATP is produced in the inner membrane of a mitochondrion. The electron transport system transfers protons

from the inner compartment of the outer, as the proton flow back to the inner compartment, the energy of their movements is used to add phosphate to ADP, forming ATP.

- A. Chemiosmosis
- B. Phosphorylation
- C. Fermentation
- D. Glycolysis

Answer:



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2. TATA box of eukaryotic promoter lies:

A. about 25 bp upstream of the transcription starts site.

B. about 50 bp upstream of the transcription starts site.

C. about 75 bp upstream of the transcription starts site.

D. about 200 bp upstream of the transcription starts site.

Answer:



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3. Imagine a gel through which DNA fragments have moved in response to an applied electrical current. The band on this gel that is farthest from the top (that is, from the place where the DNA fragments were added to the "well") represents the

A. shortest fragments of DNA

B. longest fragments of DNA

C. restriction enzyme used to cut the DNA
into fragments.

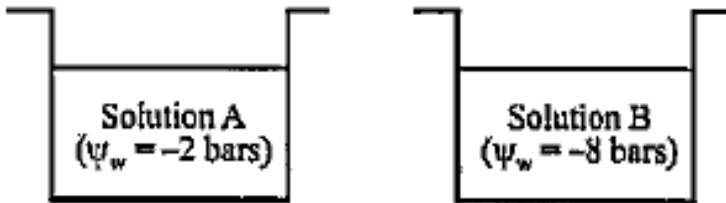
D. ligase used to bind the DNA fragments
together.

Answer:



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4. Study the figure and choose the correct statement regarding this.



A. Kinetic energy (K.E.) of H_2O in A solution

gt K.E. of water in B solution

B. K.E. of water in B solution gt K.E. of water

in A solution

C. K.E of water in A solution =K.E.Of H_2O in
B solution

D. Water potential has nothing to do with
K.E.

Answer:



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5. Which of the following events is involved in the transfer of information across a chemical synapse?(i) Neurotransmitters bind to the

postsynaptic receptors.(ii)Calcium channels open in the presynaptic region.(iii) Ion channels open in the postsynaptic membrane. (iv) Direct flow of ions from one neuron to the next.

- A. (i) and (ii) only
- B. (i),(ii) and (iii) only
- C. (ii),(iii) and (iv) only
- D. All of these

Answer:



6. If there are 999 bases in RNA that codes for a protein with 333 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered

A. 11

B. 33

C. 333

D. 1

Answer:



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7. In the context of organic evolution, the loss of limbs in snakes is explained by the phenomenon of

- A. use and disuse of organs
- B. adaptation to living in burrows
- C. natural selection
- D. inheritance of acquired characters

Answer:



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8. Vaccines produced through genetic engineering are considered safe because they

A. are active forms of antigen.

B. are the least active forms

C. contain antibodies formed for coat proteins only

D. contain antibodies against whole antigen.

Answer:



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9. Bacterial cell wall is composed of peptidoglycan, a complex of oligosaccharides and proteins. The oligosaccharide component consist of

A. Linear chain of alternating NAG and NAM linked by $\alpha(1 - 4)$ linkage.

B. Linear chain of alternating NAG and NAM linked by $\beta(1 - 4)$ linkage.

C. Linear chain of glucose linked by $\beta(1 - 4)$ linkage.

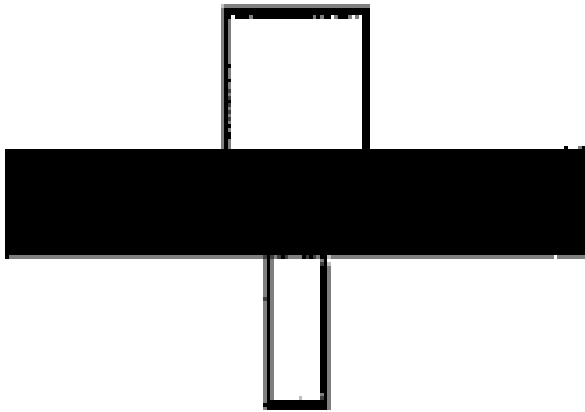
D. Linear chain of glucose linked by $\alpha(1 - 4)$ linkage.

Answer:



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10. Given below is one of the types of ecological pyramids. The type represents which of the following one



A. Pyramid of number in a forest

B. Pyramid of biomass in a fallow land

C. Pyramide of biomass in a lake

D. Energy pyramid in a spring

Answer:



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11. Insulin is a protein. It includes 17 of the 20 different amino acids. What is the minimum number of tRNA molecules involved in the synthesis of insulin?

A. 3

B. 51

C. 17

D. 20

Answer:



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12. Which one of the following statements about gene mutation is incorrect?

A. It can occur in both somatic and sex cells.

B. It can cause Down's syndrome in humans.

C. It can change a dominant allele into a recessive one

D. It can be brought about by exposure to ionising radiation

Answer:



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13. Total no.of fatty acid molecules (s) normally present in a fat or oil molecule is/are:

A. 3

B. 2

C. 4

D. 1

Answer:



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14. The 'window period' in case of HIV infection is the

A. period with clear cut observable symptoms.

B. stage, which has highest % of antibodies in blood.

C. period in which infected person is tested negative when subjected to antibody blood test.

D. stage when the person is not infected.

Answer:



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15. Levels of which hormones are at their highest during the luteal phase (second half of the cycle) of the menstrual cycle?

A. Oestrogen

B. Progesterone

C. Luteinising hormone

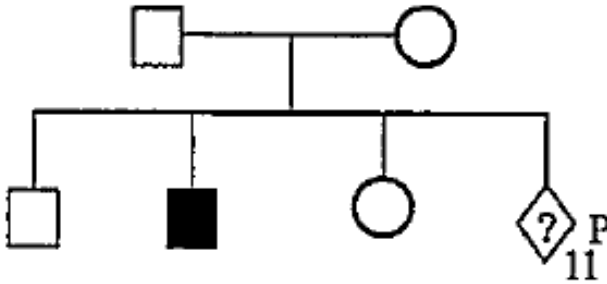
D. Follicular stimulating hormone

Answer:



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16. Study the following pedigree.



□ : Male

○ : Female

■ : Diseased Male ● : Diseased Female

◇ : Unborn individual

choose

the correct interpretation.

A. If the pedigree depicts autosomal recessive trait, then the probability of

child 'P' to be diseased is $\frac{1}{2}$.

B. If the pedigree depicts X-linked recessive trait, then the probability of child 'P' to be diseased is $\frac{1}{4}$.

C. If the pedigree depicts sex-linked trait, then there is a 50% chance that individual 'P' will be normal.

D. The pedigree depicts X-linked dominant trait, then the individual 'P' will be normal if female.

Answer:



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17. If there are 34 amino acids and DNA contains only two nitrogenous bases, what would be the minimum number of bases per codon that code for amino acids?

A. 3

B. 4

C. 5

D. 6

Answer:



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18. Select the incorrect statement about meiosis.

A. Kinetochores of sister chromatids attach to opposite poles in meiosis I

B. Kinetochores of sister chromatids attach to opposite poles in meiosis II

C. Chiasmata is formed in prophase I

D. Homologous chromosomes are segregated in meiosis I.

Answer:



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19. what will happen if histones are depleted from a metaphase chromosome and viewed under a transmission electron microscope?

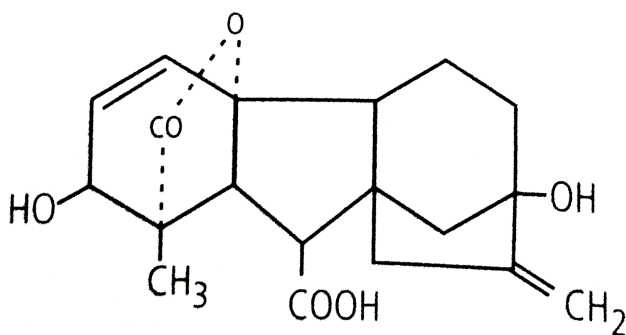
- A. 30 nm chromatin fibres will be observed.
- B. 10 nm chromatin fibres will be observed.
- C. A scaffold and a huge number of loops of DNA fibers will be observed.
- D. A huge number of loops of DNA fibers without scaffold will be observed.

Answer:



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20. Select the correct option regarding the phytohormone to which the given molecular structure belongs.



A. The hormone promotes femaleness in most flowers.

B. The hormone promotes apical dominance.

C. The hormone usually decreases the size of stem, leaves, flowers and fruits.

D. The hormones breaks seed dormancy by synthesis of certain enzymes.

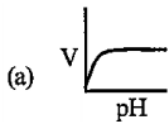
Answer:



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21. Which one of the given graph shows the effect of pH on the velocity of a typical enzymatic reaction (V)?

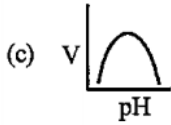
A.



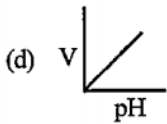
B.



C.



D.



Answer:



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22. Which of the following types of mammalian cell does not carry out oxidative

phosphorylation?

A. Cardiac muscle cells

B. Erythrocytes

C. Neurons

D. Oxyntic cells

Answer:



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23. Blood group AB has

A. No antigen

B. No antibody

C. Neither antigen nor antibody

D. Both antigen and antibody

Answer:



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24. One child is haemophilic (sex-linked trait), while its fraternal twin's brother is normal.

Which one of the following informations is most appropriate?

A. The mother must have been heterozygous.

B. The child is a monozygotic twin.

C. The other child is a female and the father is haemophiliac.

D. The haemophiliac child is a male.

Answer:



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25. One microelectrode is inserted into a healthy neuron and another is placed outside the cell. If the neuron is then hyperpolarised by a chemical stimulus, what will happen to the membrane potential recorded by the electrodes?

A. It will become more positive.

B. It will become more negative.

C. It will first become more positive, then return to normal.

D. It will not change.

Answer:



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26. A pasture of 40 hectares has a biomass of 40kg hectare, or roughly 1,000,000 calories of energy. Cattle grazing on this pasture are sold for beef. About how many calories of energy

from the pasture reach human consumers of the beef?

A. 10, 000

B. 1000

C. 100, 000

D. 1, 000, 000

Answer:



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27. Jet lag occurs when a person moves rapidly from one time zone to another, causing conflict between the body's biological rhythm and the new cycle of light and dark. Some scientists suspect that jet lag may result from disruption of a daily hormone cycle. Which of the following hormones do you think is the most likely suspect?

A. Epinephrine

B. Insulin

C. Melatonin

D. Oestrogen

Answer:



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28. Choose the sequence in which the following enzymes take part in DNA replication. (i) Helicase (ii) Primase (iii) SSB (iv) DNA polymerase (v) DNA ligase

A. (i) \rightarrow (v) \rightarrow (iv) \rightarrow (iii) \rightarrow (ii)

B. $(i) \rightarrow (ii) \rightarrow (iii) \rightarrow (iv) \rightarrow (v)$

C. $(i) \rightarrow (iii) \rightarrow (ii) \rightarrow (iv) \rightarrow (v)$

D. $(i) \rightarrow (iv) \rightarrow (iii) \rightarrow (ii) \rightarrow (v)$

Answer:



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29. The colonies of recombinant bacteria appear white in contrast to blue colonies of non-recombinant bacteria because of

A. Insertional inactivation of alpha-galactosidase in non-recombinant bacteria

B. Insertional inactivation of alpha-galactosidase in recombinant bacteria

C. Inactivation of glycosidase enzyme in recombinant bacteria

D. Non-recombinant bacteria containing beta-galactosidase

Answer:



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30. The painful skin condition known as shingles is associated with:

A. Polio

B. Rabies

C. Influenza

D. Chicken pox

Answer:



31. In humans, albinism is controlled by a recessive allele. How many copies of this allele will be found at one of the poles of a cell at telophase I of meiosis in an albino person?

- A. 4
- B. 2
- C. 1
- D. 0

Answer:



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32. When an angiospermic plant of chromosomal type 'aa' pollinates another angiospermic plant of type 'AA', what chromosome constitution of embryo and endosperm is expected in the resulting seeds?

A. Zygote-Type Aa and Endosperm-type AAa

B. Zygote-Type aa and Endosperm-type Aaa

C. Zygote-TypeAA and Endosperm-typeAAa

D. Zygote-TypeAa and Endosperm-typeaaaa

Answer:



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