



# BIOLOGY

## BOOKS - KVPY PREVIOUS YEAR

### SOLVED PAPER 2019

#### Example

1. Ethanol is used to treat methanol toxicity because ethanol

A. is a competitive inhibitor of alcohol dehydrogenase

B. is a non-competitive inhibitor of alcohol dehydrogenase

C. activates enzymes involved in methanol metabolism

D. inhibits methanol uptake by cells

**Answer:**



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2. Given below is a diagram of the stomatal apparatus. Match the labels with the corresponding names of the components.



Choose

the CORRECT combination.

- A. 1-Stomatal pore, 2-Guard cell, 3-Epidermal cell, 4-Subsidiary cell

B. 1-Guard cell,2-Stomatal pore, 3-Subsidiary cell, 4-Epidermal cell

C. 1-Subsidiary cell,2-Guard cell, 3-Stomatal poreE, 4-pidermal cell

D. 1-Guard cell,2-Stomatal pore, 3-Epidermal cell, 4-Subsidiary cell

**Answer:**



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3. Which one of the following pairs was excluded from Whittaker's five kingdom classification?

A. Viruses and lichens

B. Algae and englena

C. Lichens and algae

D. Englena and viruses

**Answer:**



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4. A plant species when grown in shade tends to produce thinner leaves with more surface area, and when grown under abundant sunlight starts producing thicker leaves with reduced surface area. This phenomenon is an example of

A. character displacement

B. phenotypic plasticity

C. natural selection

D. genotypic variation

**Answer:**



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5. Sacred groves found in several regions in India are an example of

- A. in situ conservation
- B. ex situ conservation
- C. reintroduction
- D. restoration

**Answer:**



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6. Which one of the following immune processes is most effectively controlled by antihistamines?

A. Cell-mediated autoimmunity

B. IgE-mediated exaggerated immune response

C. IgG-mediated humoral immune response



D. IgM-mediated

humoral

immune

response

**Answer:**



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7. Which one of the following is explained by the endosymbiotic theory?

A. The interaction between bacteria and viruses

B. The symbiosis between plants and animals

C. The origin of mitochondria and chloroplast

D. The evolution of multicellular organisms from unicellular ones

**Answer:**



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8. According to the logistic population growth model, the growth rate is independent of

- A. per capita birth rate
- B. per capita death rate
- C. resource availability
- D. environmental fluctuations

**Answer:**



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9. A violent volcanic eruption wiped out most of the life forms in an island. Over time, different forms of simple organisms colonised this region, followed by the emergence of other organisms such as shrubs, woody plants, invertebrates and mammals. This ecological process is referred to as

A. generation

B. replacement

C. succession

D. turnover

**Answer:**



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**10.** Which one of the following microbial product is called "clot buster"?

A. Cyclosporin A

B. Paracetamol

C. Statins

D. Streptokinase

**Answer:**



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**11.** Which one of the following elements is NOT directly involved in transcription?

A. Promoter

B. Terminator

C. Enhancer

D. OriC

**Answer:**



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**12.** Which one of the following phyla is a pseudocoelomate?

A. Cnidaria

B. Nematoda

C. Mollusca

D. Chordate

**Answer:**



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**13.** Which one of the following glands does NOT secrete saliva?

A. Submaxillary gland

B. Lacrimal gland

C. Parotid gland

D. Sublingual gland



**Answer:**



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**14.** Which one of the following options correctly represents the tissue arrangement in roots?

A. Cortex, pericycle, casparian strip, vascular bundle

B. Pericycle, cortex, casparian strip, vascular bundle

C. Cortex, casparian strip, pericycle,  
vascular bundle

D. Casparian strip, pericycle, cortex, vascular  
bundle

**Answer:**



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**15.** During fermentation of glucose to ethanol,  
glucose is

A. first reduced and then oxidised

B. only oxidised

C. neither oxidised nor reduced

D. only reduced

**Answer:**



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**16.** Which of the following is/are the product(s) of cyclic photophosphorylation?

A. Both NADPH and  $H^+$

B. NADPH

C. ATP

D. Both ATP and NADPH

**Answer:**



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**17.** Which one of the following amino acids is least likely to be in the core of a protein?

A. Phenylalanine

B. Valine

C. Isoleucine

D. Arginine

**Answer:**



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**18.** Which one of the following statements is a general feature of global species diversity?

- A. It increases from high to low latitudes
- B. It increases from low to high latitudes
- C. It changes over time but not spatially
- D. It changes randomly across space and time

**Answer:**



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**19.** Which one of the following conditions is NOT responsible for the presence of deoxygenated blood in the arteries of a newborn?

A. Pneumonia

B. Atrial septal defect

C. Shunt between pulmonary artery and  
aorta

D. Phenylketonuria

**Answer:**



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**20.** Rhizobium forms symbiotic association with roots in legumes and fixes atmospheric nitrogen. Which one of the following statement is CORRECT about this process?

A. Activity of nitrogenase is sensitive to oxygen



B. Activity of nitrogenase is insensitive to oxygen

C. Anaerobic conditions allow ATP independent conversion of nitrogen to ammonia

D. Under aerobic conditions, atmospheric nitrogen can be converted to nitrates by Rhizobium

**Answer:**



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**21.** Amino acid analysis of two globular protein samples yielded identical composition per mole. Which one of the following characteristics is necessarily identical for the two proteins?

A. Disulphide bonds

B. Primary structure

C. Molecular mass

D. Three-dimensional structure

**Answer:**



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22. Which of the following conversions in glycolysis is an example of substrate level phosphorylation?

A. Glyceraldehyde-3-phosphate to 1,3-bisphosphoglycerate

B. 1,3-bisphosphoglycerate to 3-phosphoglycerate

C. Fructose 6-Phosphate to fructose-1, 6-bisphosphate

D. Glucose-6-phosphate to fructose-6-phosphate

**Answer:**



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**23.** A plant heterozygous for height and flower colour ( $TtRr$ ) are selfed and 1600 of the resulting seeds are planted. If the distance

between the loci controlling height and flower colour is 1 centimorgan, then how many offspring are expected to be short with white flower ( $ttrr$ )?

- A. 1
- B. 10
- C. 100
- D. 400

**Answer:**



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24. The additional nuclear ploidy levels found in a diploid angiosperm species in full bloom compared to its vegetative stage are

A.  $1N$  &  $2N$

B.  $2N$  &  $3N$

C.  $3N$  &  $4N$

D.  $1N$  &  $3N$

**Answer:**



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**25.** The bill sizes in a bird species of seedcrackers from West Africa shows a bimodal distribution. Their most abundant food sources are two types of marsh plants that produce hard and soft seeds, consumed preferentially by the large and small billed birds respectively. This bimodal distribution of bill sizes is a likely consequence of

A. directional selection

B. stabilising selection

C. disruptive selection

D. sexual selection

**Answer:**



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**26.** The containers X and Y have 1 litre of pure water and 1 litre of 0.1 M sugar solution respectively. Which one of the following statements would be CORRECT regarding their



water potential ( $\Psi$ ) and osmotic potential ( $\Psi_s$ )?)?

- A. Both  $\Psi$  and  $\Psi_s$  are zero in X
- B. Both  $\Psi$  and  $\Psi_s$  are zero in Y
- C.  $\Psi$  in X is zero and  $\Psi_s$  in Y is negative
- D.  $\Psi$  in X is negative and  $\Psi_s$  in Y is zero

**Answer:**



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