

Biology, 2016 EC, natural science, entrance exam

Grade 12 · Biology · 2016 E.C.

Time allowed: 120 minutes

Questions: 35

Total marks: 35

Name _____ Grade _____ ID No. _____ Date _____

1. Gene flow is the movement of genetic material (1)
 - A. without altering the allele frequencies.
 - B. that drives a population towards perfection.
 - C. without affecting the balance of gene pool of a population.
 - D. where organisms either join or leave a population.
2. Which one of the following options is a constituent of peripheral nervous system? (1)
 - A. Afferent nerves, brain and automatic motor nerves
 - B. Somatic sensory nerves, spinal cord and efferent nerves
 - C. Afferent nerves, efferent nerves and somatic motor nerves
 - D. Spinal cord, afferent nerves and somatic sensory nerves
3. Which one of the following structures of neurons is correctly paired with its function? (1)
 - A. Axon - receives signal from muscle
 - B. Cell body - maintains structure and supply energy
 - C. Dendrites - protects the neuron and insulate it
 - D. Myelin sheath - reduces nerve impulse transmission
4. Which one of the following statements explain how nerve impulse is occurred? It occurs as a result of (1)
 - A. charge difference across the membrane of axon.
 - B. the movement of neurotransmitter molecules into myelin sheath.
 - C. balanced charge across the membrane of dendrites.
 - D. the movement of neurotransmitter molecules out of cell body.
5. Which one of the following statements is an acceptable justification of the importance of synapse? Synapse is (1)
 - A. the mechanism of protecting the axon from external damage
 - B. a connection between the appendages of consecutive neurons.
 - C. a conductor of action potential towards the end of the dendrite.
 - D. the facilitator of the reverse flow of neurotransmitter chemical in neurons.
6. Assume your friend has a blood type that has no antigen on his red blood cells but produces antibodies A and B, loses blood due to a car accident. If blood transfusion is necessary to save his life, your friend can receive blood from someone with (1)

A. blood type AB.	B. blood type O.
C. blood type B.	D. blood type A.
7. The binomial system of naming developed by Linnacus comprises two names. Which hierarchical groups are used? (1)

A. Order and family	B. Genus and species
C. Kingdom and species	D. Kingdom and phylum

-
8. Which one of the following is the feature of kingdom Monera? Its members are (1)
- A. unicellular without separated nucleus. B. multicellular with cell walls.
C. mainly autotrophic and saprophytic. D. reproduced by hypha formation.
-
9. Which alternative given below is comprised of harmful groups from the kingdom Monera, Protista and Fungi, respectively? (1)
- A. Trypanosoma, Plasmodium falciparum and Haemophilus ducreyi
B. Candida albicans, Mycobacterium tuberculosis and Trypanosoma
C. Haemophilus ducreyi, Trypanosoma and Tinea pedis
D. Trypanosoma, Plasmodium falciparum and Penicillium
-
10. Which one of the following is a feature of Octopi and squid in phylum mollusca? They have (1)
- A. segmented body with head and thorax. B. well-developed brain.
C. lung as a breathing structure. D. hard muscular foot with a hard body.
-
11. What mechanism was used by Gregor Mendel to protect the garden peas from self-pollination? He (1)
- A. opened the flower bud before pollen matured.
B. sterilized the male part of the flower using chemicals.
C. covered the flower and protects it from pollinating agents.
D. selected pure dominant traits for breeding.
-
12. Gregor Mendel crossed two pure-breeding traits of pea plants in his experiment and found only one of the traits expressed in the first generation. This shows that the (1)
- A. expressed trait must be determined by the recessive allele.
B. Two traits in the F1 generation were equally expressed.
C. alleles masked in the F1 generation were lost due to mutation.
D. expressed trait must be determined by the dominant allele.
-
13. Which one of the following statements correctly describes chromosome structure? (1)
- A. The pair of chromosomes is heterozygous in nature.
B. Chromosomes are similar to a gene in structure.
C. The DNA is wrapped with ribose sugar to form a chromosome.
D. Chromosomes are made up of histone bounded DNA.
-
14. The breeding mechanism that improves the performance of animals or plants using particular traits is (1)
- A. self-breeding. B. test cross.
C. selective breeding. D. combination of traits.
-
15. Which one of the following birth control methods is correctly matched with its function? (1)
- A. Hormonal method - prevents follicle development and ovulation
B. Physical method - reduces the lining of the uterus
C. Surgical method - avoids early embryo implantation
D. Natural method - prevent the ovum from reaching to the uterus
-
16. The ability of carnivores to survive in an ecosystem is dependent on the availability of prey. This can be considered as (1)
- A. abiotic factor. B. adaptive factor.
C. catastrophic factor. D. biotic factor.

-
17. The two reverse processes that play a significant role in absorbing and releasing carbon dioxide, respectively are (1)
- A. combustion and photosynthesis. B. decomposition and respiration.
C. respiration and assimilation. D. photosynthesis and respiration.
-
18. Which one of the following adaptations is important for survival of polar bear in very cold environments? Having (1)
- A. smaller size B. fine silky fur
C. blubbers under the skin D. thick wrinkled ears
-
19. A student concluded that the stage of meiosis on a prepared slide of plant tissue he observed was Anaphase II. (1)
What do you think was the reason to come to this conclusion? Observation of
- A. divided centromere and separated sister chromatids
B. reformed nuclear envelope and reappearance of nucleolus
C. one chromosome from each homologous pairs at the poles
D. crossing over between non-sister chromatids of homologous pairs
-
20. Which one of the following plant species is endemic to Ethiopia? (1)
- A. *Percica papaya* B. *Eucaliptus globulose*
C. *Aurocaria baramuleta* D. *Guizotia abyssinica*
-
21. Which one of the following national parks of Ethiopia is declared as the world's heritage site and comprises (1)
endemic animals like *Walia ibex*?
- A. Yangudi Rassa National Park B. Simien Mountain National Park
C. Rift Valley National Park D. Bale Mountain National Park
-
22. A mother milks her cow every morning and the milk usually forms curd after three days. What is the first step to (1)
investigate why this change happens?
- A. Take action to prevent the milk from curdling
B. Read scientific articles about the reason for curdling of milk
C. Formulate hypothesis about the reason for milk curdling
D. Ask a question why the milk forms curd
-
23. A drug efficacy test was conducted under similar set up on two groups of infected mice (A and B), groups A (1)
were the control whereas group B were experimental group. A student gave a placebo to the control group and
the drug to the experimental group. At the end, the experimental group got better. Which one of the following is
true about the result?
- A. Conclusion cannot be reached. B. Placebo has better effect.
C. The drug has an effect. D. The experiment was wrong.
-
24. Suppose you did an experiment in a biology laboratory and need to report your work to your biology teacher. (1)
Which one of the following steps is correct to report the finding?
- A. Title → Procedure → Result → Hypothesis → Prediction → Evaluation
B. Title → Hypothesis → Procedure → Prediction → Conclusion → Result
C. Title → Hypothesis → Prediction → Procedure → Result → Conclusion
D. Title → Prediction → Procedure → Hypothesis → Result → Conclusion

-
- 25.** Which one the following statements explains how the allosteric inhibitors affect enzymes activities? By binding to the (1)
- A. substrate and preventing it from binding to the active site
 - B. site other than the active site and altering the shape of the active site
 - C. active site of an enzyme and blocking the substrate
 - D. active site and altering the shape of the enzyme
-

- 26.** Why are enzymes considered special molecules in metabolism? Because (1)
- A. metabolic processes can produce special products in the presence of enzymes.
 - B. enzymes facilitate metabolic reactions under controlled physiological conditions.
 - C. enzymes are protein molecules that act as a source of energy.
 - D. reactions can't totally take place in the absence of enzymes.
-

- 27.** Which of the following is the most advanced and recent event in the history of cell biology? (1)
- A. Discovery of the double-helix structure of DNA
 - B. Enovation of the first scanning electron microscopd
 - C. Deserption of the Golgi apparatus
 - D. Sequencing of the human genome
-

- 28.** A student focused a slide of an onion epidermal cell on pre-estimated width of 2 millimeter field of view under a microscope. What will be the width of each individual cell if you count cells that fit to the field of view during your observation? (1)
- A. 16 millimeter
 - B. 0.25 millimeter
 - C. 0.40 millimeter
 - D. 4 millimeter
-

- 29.** Which one of the following statements is correct about the differences between eukaryotic and prokaryotic cells? Prokaryotic cells have (1)
- A. membrane bound organelles whereas eukaryotic cells don't have it.
 - B. small ribosomes whereas eukaryotic cells have large ribosomes.
 - C. cell wall whereas eukaryotic cells don't have cell wall.
 - D. division of labor whereas eukaryotic cells don't have it.
-

- 30.** Which biological tool is correctly matched with its function? (1)
- A. Petri dishes - to culture microorganisms
 - B. Burctte - to measure mass of a substance
 - C. Centrifuges - to collect insects
 - D. Theodolite - to measure the rate of water flow
-

- 31.** This item is based on the following pyramid of biomass. (1)

Which alternative contains organisms that can occupy the above pyramid of biomass from the bottom to the top?

 Question Diagram

- A. Grass, Cricket, Chicken and Lizard,
- B. Grass, Cricket, Lizard and Chicken
- C. Grass, Chicken, Cricket and Lizard
- D. Grass, Lizard, Cricket and Chicken

- 32.** A student made an experiment to observe the effect of temperature on catalase of mashed potato. After three parallel trials, he obtained the following results. (1)

At which temperature was the reaction fastest?

 Question Diagram

- A. 10° C B. 30° C
C. 50° C D. 55° C

33. A student conducted a food test on three unknown food samples and obtained results as presented in the table below. (1)

What do you conclude from the result of the above experiment?

 Question Diagram

- A.** Lipids and reducing sugars are absent from all the three food samples tested.
- B.** Proteins and reducing sugars are found in all the food samples at equal concentrations.
- C.** Non-reducing sugars are present in all the food samples at different concentrations.
- D.** Reducing sugars are found in two of the samples and proteins are found in all the samples.

- 34.** This item is based on the following diagram about eye structure. (1)

The part of the eye represented by letter "Y " is

 Question Diagram

- A. ciliary muscle.
- B. optic nerve.
- C. iris.
- D. pupil.

- 35.** This item is based on the following table about the function of cellular. (1)

=> Which numbers in the above table show the correct function of the given organelles?

 Question Diagram

- A.** 2 and 4 **B.** 2 and 3
C. 1 and 4 **D.** 1 and 3

— END OF EXAMINATION —