

KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

Marks scored:

Level : B.Sc./B.Tech.

Course : BIOL 103

Year : I

Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20 JUN 2023

Registration No.:

Date : 25 JUN 2023

SECTION "A"
[10Q. × 0.5 = 5 marks]

Mark [×] to the most appropriate alternative from each set of choices.

- Morphologically similar but physiologically different gametes are called as _____.
 Isogamous Anisogamous Oogamous Anogamous
- All chromosomes are aligned at the equator in _____.
 Prophase Metaphase Anaphase Telophase
- In which organelle does most of the oxidation and reduction reaction occur?
 Lysosomes Mitochondria Ribosome Peroxisome
- A single outermost layer of compactly arranged cells covered by cuticle is _____.
 Epidermis Hypodermis Cortex Pericycle
- Which of the following is **NOT** an essential amino acid?
 Histidine Isoleucine Leucine Alanine
- The body of ovule becomes inverted and the micropyle lies very close to hilum in _____.
 Orthotropous ovule Anatropous ovule
 Campylotropous ovule Circinotropous ovule
- The process of formation of mRNA from DNA is called as _____.
 Replication Transcription Translation Mutation
- When negative interactions occur among individuals, the population is arranged in _____.
 random pattern clumped pattern
 uniform pattern aggregate pattern
- Similarity in the developmental processes due to inheritance from a common ancestor is due to _____.
 Developmental homology Structural homology
 Genetic homology Morphological homology
- Which enzyme converts Lycopene to β -carotene in Golden Rice?
 Phytoene synthase Carotene desaturase
 β -cyclase Lycopene ligase

SECTION "B"
[5Q. × 1 = 5 marks]

Fill in the blanks.

11. The art of preparing and preserving the skins of animals and of stuffing and mounting them in life like form is called as _____.
12. Cells forming the lining of ovary and seminiferous tubules are called _____.
13. The hemisphere of morula composed of fewer number of large white and yolk laden cells is known as _____.
14. The evolutionary change that occurs in species traits, called as _____ enables species to exploit different resources.
15. _____ are protein molecules produced by most animals in response to infection by pathogens.

SECTION "C"
[5Q. × 1 = 10 marks]

Define in ONE sentence.

16. Non-sister chromatids
17. Transpiration
18. Multiple allelism
19. Divergence through Vicariance
20. Commensalism

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Time : 2 hrs. 30 mins.

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F. M. : 55

SECTION "D"

(Long answer questions)
[3Q. × 7 = 21 marks]

Attempt *ANY THREE* questions.

1. Explain the processes of digestion based upon the site of digestion? How is the digested nutrients absorbed in the small intestine?
2. Describe the process of Dicot plant embryogenesis.
3. Describe the phenomenon of Epistasis. Explain the pattern of inheritance of flower color in sweet peas where the F₂ generation shows purple and white colorations only.
4. Using the niche concept, explain what happens when one species is a better competitor than another and when both species tries to avoid competition.

SECTION "E"

5. Write short notes on (*ANY FIVE*): [5Q. × 4 = 20 marks]
 - a. Cell cycle checkpoints can arrest the cell cycle
 - b. Internal Structure of Dicot stem with a transverse section
 - c. Overview of embryonic development in frogs
 - d. Chromosomal basis of Principle of Independent Assortment
 - e. Genetic drift induces changes in allele frequencies of a population
 - f. Immunoassays can detect virus
6. Give *TWO* major differences between: [2Q. × 2 = 4 marks]
 - a. Aerobic and Anaerobic respiration
 - b. Allopatry and Sympatry
7. Explain **why/how** for the following. [5Q. × 2 = 10 marks]
 - a. Fungi is economically important.
 - b. Testcross identifies unknown genotype.
 - c. Ocean acidification leads to decline in coral population
 - d. Mitochondria is the powerhouse of the cell
 - e. Organization of body allows for communication and regulation