KATHMANDU UNIVERSITY
End Semester Examination
June/July 2024

Marks Scored:

Level : B.Pharm.
Year : I

Course : BIOL 102
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date 02 JUL 2024

SECTION "A"
[15Q. × 1 = 20 marks]

Choose and encircle the most appropriate option from each set of choices

1. Which one is photosynthetic prokaryotes?
   a. Spirogyra b. Chlorella c. Spirulina d. All of the above

2. Which one is **NOT** a protist?
   a. Spirogyra b. Amoeba c. Paramecium d. Euglena

3. Select the gram-negative bacteria
   a. Staphylococcus aureus b. Bacillus anthracis
   c. Staphylococcus pneumoniae d. Helicobacter pylori

4. In bacteria which one is absent:
   a. Enclosed nucleus b. Cell wall
   c. Cytoplasm d. Ribosomes

5. Select **CORRECT** statement regarding Peptidoglycans:
   a. It is absent in bacteria b. It is thick in gram-negative bacteria
   c. It is thick in gram-positive bacteria d. It is present inside the cell membrane

6. Endotoxins are
   a. Lipid and Proteins b. Lipid and Polysaccharide
   c. Proteins d. Lipids

7. Outer membrane of nuclear membrane continues to form:
   a. Golgi apparatus b. Endoplasmic reticulum
   c. Vacuoles d. Lysosomes

8. Which one is **WRONG** about motor protein:
   a. Kinesisn and Dyneins move along microtubules,
   b. Myosins move along microfilaments.
   c. Dyneins movement is from the (+) end of the microtubule to the (-) end
   d. Kinesin movement is from the (+) end of the microtubule to the (-) end

9. Total ATP produced in glycolysis is:
   a. 1 b. 2 c. 4 d. 8

10. Which ions are present in higher concentrations outside the cell?
    a. Sodium & Potassium b. Chloride & Sodium
    c. Potassium & Chloride d. Sodium, Potassium & Chloride

11. Which one is **INCORRECT**:
    a. In tight junction, the cell membranes are connected, and the contents can move from one cell to another.
    b. Communicating junctions establish direct physical connections that link the cytoplasms of two cells together, permitting small molecules or ions to pass from one to the other.
    c. Gap junctions provide passageways large enough to permit small substances, such as simple sugars, water, ions and amino acids, to pass from the cytoplasm of one cell to that of the next, yet small enough to prevent the passage of larger molecules such as proteins.
    d. Hemidesmosomes anchor epithelial cells to a basement membrane (extracellular matrix).

12. Select the semi-autonomous organelles in animal:
    a. Mitochondria
    b. Chloroplast
    c. Endoplasmic reticulum
    d. Golgi apparatus

13. Which one is **WRONG** about Euchromatin and Heterochromatin?
    a. Heterochromatin is a highly condensed/tightly packed region of DNA.
    b. Heterochromatin is transcriptionally active.
    c. Euchromatin is a delicate, less condensed region of DNA.
    d. Euchromatin is transcriptionally active.

14. During the electron transport chain reaction, which one is **CORRECT**?
    a. Protons are pumped toward the intermembrane space by complex I, III and IV.
    b. Protons are pumped towards the matrix by complex I, III and IV.
    c. The source of energy for ATP synthesis is the electrochemical gradient of OH- ion.
    d. Oxygen is generated in the last step of the ETC reaction.

15. In the solenoid model of packing of DNA, how many nucleosomes are there in a turn?
    a. 4
    b. 6
    c. 8
    d. 10

16. Actin is the structural unit of
    a. Microfilament
    b. Cell membrane
    c. microtubule
    d. intermediate filament

17. Ribosome is not present in.
    a. Rough endoplasmic reticulum
    b. Chloroplast
    c. Mitochondria
    d. Vacuole

18. How many pair of centrioles are there in anaphase stage of mitosis?
    a. 6
    b. 4
    c. 2
    d. 1

19. Write the correct order for Solenoid model of packaging of DNA
    a. DNA → nucleosome → solenoid → chromatin fiber → chromatid → chromosome
    b. DNA → solenoid → nucleosome → chromatin fiber → chromatid → chromosome
    c. DNA → nucleosome → solenoid → chromatid → chromatin fiber → chromosome
    d. DNA → nucleosome → chromatid → chromatin fiber → solenoid → chromosome

20. Which one is **NOT** the sexual reproduction of prokaryotes
    a. Conjugation
    b. Transformation
    c. Binary fission
    d. Transduction

KATHMANDU UNIVERSITY
End Semester Examination
June/July 2024

Level : B.Pharm.
Year : I
Time : 2 hrs. 30mins.

02 JUL 2024

Course : BIOL 102
Semester : II
F. M. : 55

Check (√) the number of each question you have answered in the front page of main answer book

SECTION "B"
[5 Q. × 3 = 15 marks]

Attempt *ANY FIVE* questions.

1. Write short notes on fission and fusion of mitochondria. [3]
2. Explain plasma membrane with its component. [3]
3. Name the type of plastids with their functions. [3]
4. Write the process of electron transport during photosynthesis. [3]
5. Write two major functions of tight junctions. [3]
6. Write about primary active transport with figure. [3]
7. Write about secondary cilia. [3]

SECTION "C"
[5 Q. × 5 = 25 marks]

Attempt *ANY FIVE* questions.

8. Write the differences between endotoxin and exotoxin (at least 5). [5]
9. Write about the prometaphase stage of mitosis along with four steps for the formation of metaphase plate. [5]
10. Write the six applications of cell–cell interactions and communication. Explain any one of them. [5]
11. Explain the architecture/structure of intermediate filaments along with its function. [5]
12. Explain how electron transport chain creates electrochemical gradient of hydrogen ion across intermembrane space and matrix of mitochondria. [5]

P.T.O.

13. Having more content of DNA does not mean that there is higher number of gene. Similarly, lesser DNA content doesn't mean lesser gene. Justify the statements. [5]

14. Write the five applications of cell-cell interaction and communication. [5]

SECTION "D"

[2 Q. × 7.5 = 15 marks]

Attempt *ANY TWO* questions.

15. Describe the integral and peripheral protein of the cell membrane. Explain the role of detergent in cell lysis. [7.5]

16. Describe all types of cell signalling with figure and examples. [7.5]

17. Define karyotype and idiogram. Give the features of the human karyotype. Describe the role of karyotype in clinical medicine and study of evolution. Give a short process of preparing karyotypes from cell cultures. [7.5]