Roll No. .....

E–533

M. Sc. (Second Semester)
EXAMINATION, May-June, 2021

ZOOLOGY

Paper Second

(Tool and Techniques in Biology)

Time : Three Hours] [*Maximum Marks : 100*

Note : Attempt all Sections as directed.

Section—A 1 each

(Objective/Multiple Choice Questions)

Note : Attempt all questions.

Choose the correct answer :

1. One of the following instruments is different from the others on the basis of their nature of work :
   (a) Centrifuge
   (b) Electrophoresis
   (c) Chromatogram
   (d) Colorimeter

2. A centrifuge works on the basis of the following force ?
   (a) Gravitational force
   (b) Centrifugal force
   (c) Both of the above
   (d) None of the above

3. The following option of RPM justifies ultracentrifuge :
   (a) 1000 to 3000 RPM
   (b) 3000 to 6000 RPM
   (c) 10000 to 20000 RPM
   (d) More than 60000 RPM

4. Electrophoresis technique is developed by :
   (a) Tswett
   (b) Tiselius
   (c) Svedberg
   (d) Sanger

5. In electrophoresis, DNA will migrate towards :
   (a) Cathode or positive electrode
   (b) Anode or negative electrode
   (c) Cathode or negative electrode
   (d) Anode or positive electrode

6. Which range of electromagnetic radiation is used in colorimeter ?
   (a) 0.0001 to 0.01 nm
   (b) 1.0 to 10.0 nm
   (c) 400 to 700 nm
   (d) 1000 nm to 5000 nm

7. Which microscope can be used for see living microorganisms ?
   (a) Transmission electron microscope
   (b) Scanning electron microscope
   (c) Fluorescence microscope
   (d) Phase contrast microscope

8. Resolving power of microscope can be defined as :
   (a) Ability of enlarging the object,
   (b) Ability of projection on the object.
   (c) Ability of separation of two spots of nearest distance.
   (d) Ability of separation of two spots of longest distance.

9. Which among the following helps in getting a three-dimensional (3D) picture of the specimen ?
   (a) Transmission electron microscope
   (b) Scanning electron microscope
   (c) Phase contrast microscope
   (d) Compound microscope

10. The secondary electron radiated back in scanning electron microscope is collected by :
    (a) Specimen
    (b) Anode
    (c) Vacuum chamber
    (d) Cathode

11. What is the minimum distance for the eye to focus any object ?
    (a) 11 cm
    (b) 25 cm
    (c) 32 cm
    (d) 42 cm

12. The greatest resolution in light microscopy can be obtained with :
    (a) Longest wavelength of visible light used.
    (b) An objective with minimum numerical aperture.
    (c) Shortest wavelength of visible light used.
    (d) Shortest wavelength of visible light used and an objective with the maximum numerical aperture.

13. The full form of “ELISA” is :
    (a) Enzyme-Linked Immunosorbent Assay
    (b) Antibody-Linked Immunosorbent Assay
    (c) Antigen-Linked Immunochemical Sequencing Analysis
    (d) Antibody-Linked Immunochemical Sequencing Analysis

14. Following one is related with biological assay ?

    (a) Chromatogram

    (b) Kymograph

    (c) Electrogram

    (d) Chaemotaxis

15. Which of the following is not a natural stain ?

    (a) Brazilin

    (b) Carmine

    (c) Safranine

    (d) Hematoxylin

16. Which of the following is good for staining proteins ?

    (a) DAPI

    (b) Ethidium bromide

    (c) Coomassie blue

    (d) Safranin

17. Which of the following is not a fluorescent stain ?

    (a) Aniline blue

    (b) Acridine orange

    (c) Propidium iodide

    (d) Rhodamine

18. Which of the following is not termed as hybridization ?

    (a) DNA and *c*DNA

    (b) DNA and *m*RNA

    (c) DNA from different species

    (d) DNA from male and female of same species

19. Northern blotting is performed for :

    (a) Determining the size of DNA

    (b) Determining the size of RNA

    (c) Quantification of RNA

    (d) Sequencing of RNA

20. Which of the following is not a type of sterilization ?

    (a) Batch

    (b) Continuous

    (c) Filter

    (d) Submerged

Section—B 2 each

(Very Short Answer Type Questions)

Note : Attempt all questions ‘precisely and to the point’.

1. Write *two* names of gels used in electrophoresis.
2. What do you mean by “moving phase” in paper chromatography ?

3. How does wavelength of light effect the resolution of microscope ?
4. What is numerical aperture ?
5. Name *two* strains of proteins.
6. What do you mean by *in-vivo* and *in-vitro* ?
7. What is freeze etching ?
8. Define sterilization.

Section—C 3 each

(Short Answer Type Questions)

Note : Attempt all questions (Word limit 75 words).

1. What is centrifugal effect ?
2. Define Lambert-Beers law.
3. Write the principle of flow cytometers.
4. Write the role of annular ring in phase contrast microscope.
5. What is the chemical basis of fixation by alcohol and acetone ?
6. Write about the nucleic acid strains.
7. What do you mean by cot curve ?
8. How is media prepared for tissue culture ?

Section—D 5 each

(Long Answer Type Questions)

Note : Attempt all questions. Internal choice for each question/unit is given.

1. Discuss about principle and types of chromatographic techniques.

Or

Discuss about principle and types of electrophoresis.

2. Describe the working principle of fluorescence microscopy.

Or

Discuss about principles and types of electron microscope.

3. Discuss about biological assay in detail.

Or

Discuss about the chemical basis of staining of proteins.

4. Discuss about various types of freeze techniques.

Or

Discuss about the protein sequencing.