

2019

Part – II

ZOOLOGY

(Honours)

Paper – IV

Full Marks – 90

Time : 3 Hours

*The figures in the right-hand margin indicate marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

Answer any **two** questions from the following :

2×15

1. Classify bacteria on the basis of their cell shape and arrangement of flagella. Describe the life cycle of HIV with a labelled diagram.

(3+3)+(5+4)

2. Differentiate between 'Null hypothesis' and 'Alternative hypothesis'. What is Yate's correction factor? Find out whether or not the following *observed distribution of phenotypes in a sample*

of 400 *Drosophila* flies have significant goodness of fit with proposed Mendelian 9:3:3:1 distribution.

Phenotypes :	AB	Ab	aB	ab	Total
Number of individuals :	220	102	54	24	400

$$[ \chi^2_{0.05(3)} = 7.82 ]$$

Define variance. 3+2+8+2

3. Describe the histology of endocrine pancreas with illustration. Name the hormones secreted from different kinds of cells of pancreas. Describe the mode of action of Insulin. 6+3+6
4. What is the difference between a stain and a dye? Classify dyes with example. What is tissue fixation? What are additive and non-additive fixatives? Give the composition of any fixative and mention the function of its components. 2+6+1+3+3
5. (a) Write down the role of SDS and b-mercapto-ethanol in SDS-PAGE. 4  
(b) Write down the working principle of thin layer chromatography. 5  
(c) What do you understand by Rf value. State Beer and Lambert law. 2 × 3

### Group – B

Answer any **Five** questions from the following : 5×8

6. Write down the principle of gram staining. How does it differ from that of Acid fast staining. 5+3

7. What do you mean by biological pesticides? How they are advantages over chemical pesticides? Write two advantages and two disadvantages of microbial insecticides. 2+2+4
8. State the process of microbial cheese production. 8
9. Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y). 8

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

10. Write a short note on PUBMED and its application in Bio informatics. Write the full form of BLAST. 6+2
11. Explain the histoarchitecture of the thyroid gland. Name two hormones that are produced by posterior pituitary and state one function of each. 4+4
12. Describe the principle of optical microscopy with the help of a diagram. What is resolution of microscope? 6+2
13. How can you differentiate TEM from SEM. State the working principle of phase. Contrast microscope along with a suitable diagram. 4+4
14. Write the scientific name of the plant from which haematoxylane is obtained. How can you prepare haematoxylene in the laboratory? Which part of a *cell is stained by haematoxylene* and why? 2+4+2

## Group – C

Answer any **Five** questions from the following : 5×4

15. Differentiate lytic and lysogenic phases in the life cycle of a virus. 4
16. What is a mordant ? Why it is used during staining ? Name the modrant that is used during gram staining. 2+2
17. Write down the functions of oestrogen. 4
18. State the principle of chromatography. 4
19. State the function of  $T_3$  and  $T_4$  in human system. 4
20. Write a short note on hormonal regulation of calcium metabolism. 4
21. State the working principle of a spectrophotometer. 4
22. Write down the principle of Sudan Black staining. 4
23. What is F factor ? Explain the importance of F factor in bacterial conjugation. 1+3