UG/II/ZOOL/H/IV/18(New)

2018

ZOOLOGY

[Honours]

PAPER –IV

Full Marks : 90

Time : 4 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

[NEW SYLLABUS]

GROUP – A

Answer **two** questions from the following : 15 × 2

1. (*a*) Differentiate Gram-positive from Gram -negative bacteria.

(*b*) With suitable illustrations, describe different phases of bacterial growth.

(*c*) Describe different methods of measuring microbial concentration. 5 + 5 + 5

2. (*a*) What are 'null hypothesis' and level of significance ?

(*b*) 10 rats were administered with a certain dose of medicine. The heart rates (per minute) before administration of the medicine were 62, 65, 60, 70, 68, 63, 65, 67, 69, and 61; and after administration of the medicine, those were 57, 43, 42, 58, 54, 50, 51, 53, 55 and 52 respectively. Examine if any significant decrease in the heart rate has occurred due to medicine. [$t_{0.05(9)} = 2{\cdot}10$]. (2 + 2) + 11

3. What do you mean by double staining ? Explain. How do you differentiate between coagulant and non-coagulant fixative ? Give example. State the composition of Bouin's fluid. What functions do those compounds subserve in Bouin's fluid ? 4 + 4 + 1 + 3 + 3

4. What is the chemical nature of thyroid hormone ? Which form of thyroid hormone is more active ? What are the basic differences between peptide and steroid hormone action ? How many second messengers are involved in the process of peptide hormone action. Describe in brief, the cAMP mediated peptide hormone action. 2 + 1 + 4 + 2 + 6

5. Write short notes on (any *three*) : 5 ×.3

   (*i*) Pie diagram

   (*ii*) Auxochrome and chromophore

   (*iii*) Cumulative frequency

   (*iv*) Use of microbes in food production.

GROUP – B

Answer **five** questions from the following : 8 × 5

6. What is sugar fermentation test ? Define pure culture and bacterial strain. State the characteristic features of phylum Actinomycetes. 3 + 3 + 2

7. Give a detailed account of the role of hypothalamus in regulation of body temperature. 8

8. Write the salient features of antibiotics. Add a note on their mechanisms of action. Write the name of two antibiotics that are effective against streptococcus infection. 3 + 3 + 2

9. Define correlation coefficient. What do you mean by simple and multiple correlation ? Explain positive and negative correlation. 2 + 4 + 2

10. What do you mean by ERICA tool ? How does it work ? State the use of BLAST. 2 + 3 + 3

11. Explain the histoarchitecture of mammalian testis. Mention the functions of parathyroid gland. 4 + 4

12. Mention the basic principle of PAS reaction. What do you mean by metachromasia ? What is the advantage of phase contrast microscope over light Microscope ? 4 + 2 + 2

13. What is electrophoresis ? State the principle of polyacrylamide gel electrophoresis and its role in protein purification. 2 + 4 + 2

14. What is bacteriophage ? What are the differences between lytic and lysogenic phases of the life cycle of virus ? Classify bacteria based on their shape. 2 + 2 + 4

GROUP – C

Answer **five** questions from the following : 4 × 5

15. Distinguish between Growth rate and generation time. Define Antibiotic. 3 + 1

16. Mention the hormones secreted from anterior pituitary. State function of any one of them. 2 + 2

17. State the working principle of scanning electron microscope. 4

18. State the features of hypothyroidism and hyperthyroidism. 2 + 2

19. Differentiate acid dye from basic dye. 4

20. Mention at least 4 factors that are taken into consideration while deciding the size of a sample. Justify with proper reasons why sampling from a population rather than considering the whole population is more suitable for different statistical approaches. 2 + 2

21. What is degree of freedom ? How to calculate the degree of freedom for 'r' set of variables ? 2 + 2

22. Write the cause and the symptoms of any *two* of the following : 2 × 2

    (*i*) AIDS

    (*ii*) Cholera

    (*iii*) Typhoid fever.

23. Name four nucleotide databases and four protein Databases. 4
