

2021
ZOOLOGY
[HONOURS]
Paper : V

Full Marks : 75

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.*

1. Answer any **five** of the following: 1×5=5
- a) What is cell line?
 - b) What do you mean by inclusive fitness of animals?
 - c) What do you mean by crepuscular animals?
 - d) Define sibling species.
 - e) Define phenotypic plasticity in animal behaviour.
 - f) What is OTU?
 - g) Define distribution coefficient (kd).

2. Answer any **six** of the following: 2×6=12
- a) Distinguish between classical conditioning and operant conditioning.
 - b) What do you mean by secondary electrons?
 - c) How does light and photoperiodism influence bird migration?
 - d) What do you mean by circadian rhythm? Give an example.
 - e) Distinguish between instinct and learning behaviour of animals.
 - f) Define Hamilton's rule for altruism in animals.
 - g) What are Zugdisposition and Zugunruhe in bird migration?
 - h) What do you mean by gel filtration or molecular sieving?
 - i) Distinguish between fluorescence and phosphorescence.
3. Answer any **three** of the following: 6×3=18
- a) Write about the basic principle of centrifugation. What do you mean by density gradient centrifugation? 4+2

b) Define altruism. In what condition, selfish behaviour is observed in animals? What is kinship? Explain reciprocal altruism with example. What is by-product of mutualism?

1+1+1+2+1=6

c) Define FAP. What is imprinting? Define habituation. What is latent learning? Define reinforcement.

1+1+1+2+1=6

d) Define game theory. What is the application of game theory in the field of animal behaviour?

2+4

e) Distinguish between primary cell culture and secondary cell culture. Write about different types of culture media used in cell culture.

2+4

4. Answer any **four** of the following: 10×4=40

a) What is biological clock? What do you mean by entrainment of biological clock? How is SCN related to circadian rhythm? Write about the adaptive significance of circadian rhythm.

2+2+2+4=10

b) What do you mean by 'Resolution' of microscope? Why the resolution of electron microscope is higher than light microscope?

Briefly write the principle and applications of phase contrast microscope. 2+2+4+2=10

c) What do you mean by biological species concept? Write its merits and demerits. How does biological species concept differ from morphological special concept? Distinguish between sympatric and allopatric species. What is speciation?

3+2+2+2+1=10

d) Define parental care. Write about different types of parental care exhibited by amphibians.

2+8=10

e) Define Hardy-Weinberg Equilibrium. What are its limitations? One hundred persons from a small town were tested for their MN blood types. The genotypic data were: MM41;MN38 and NN21. Calculate gene frequency of M and N. Is the population in Hardy-Weinberg equilibrium?

2+2+6=10

f) Write about the basic principle of chromatographic technique. What do you mean by ion exchange chromatography and HPLC?

4+3+3=10