

2018

ZOOLOGY

[Honours]

PAPER – II

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

GROUP – A

Answer two questions from the following : 15 × 2

1. (a) Write the ultrastructure of Plasma Membrane. 10
(b) Briefly describe the function of Golgi Complex. 5

(Turn Over)

2. (a) Describe an experiment to demonstrate that crossing-over occurs at four strand stage. 10
- (b) Diagrammatically demonstrate type of crossing-over in an eukaryotic cell. 5
3. (a) Explain the mechanisms of aerosome reaction with suitable diagram. 8
- (b) Define Batesian and Mullerian mimicry with suitable examples. 7
4. (a) Provide a schematic representation of mammalian oogenesis. Classify eggs on the basis of amount and distribution of yolk. 5 + 3
- (b) What is capacitation ? 2
- (c) How is polyspermy prevented during fertilization ? 5
5. In *Drosophila*, the sex-linked genes *cut* (ct), *lozenge* (lz) and *forked bristles* (f) are with the following map distance apart : *cut* to *lozenge* : 8.40 units; *lozenge* to *forked bristles* : 28.0 units. The have an interference of 0.3. Find out —

(3)

- (i) the expected number of genotypes out of 2000 flies recovered from the cross of : 12

$$\begin{array}{ccccccc} ct & Lz & f & & ct & lz & f \\ & & & \times & & & \\ + & + & + & & & & \end{array}$$

- (ii) What will be the result if there is no interference ? 3
6. (a) Write the limitations of Biological species concept. 4
- (b) Write in brief about modern trends in taxonomy. 4
- (c) What do you mean by Zoogeographical realm ? Write down the flora and fauna present in Oriental Realm. 2 + 5

GROUP – B

Answer any five questions from the following : 8 × 5

7. Define extra-embryonic membrane. Mention different extra-embryonic membranes found in chick and mention their function. 2 + 2 + 4

8. (a) Mention the possible signals and markers used by the migratory birds during the trans-continental flights. 5
- (b) What is Cambrian explosion? 3
9. (a) Mention the physiological adaptations of camel for sustenance in hot desert climate. 5
- (b) Explain the significance of the *law of priority* in enforcing the rules of binomial nomenclature. 3
10. (a) What is industrial melanism? Explain it taking *Biston betularia* as an example. 2 + 3
- (b) Compare : A-DNA, B-DNA and Z-DNA. 3
11. Describe the classical experiments of Spemann and Mangold on organizer action. 8
12. What is nucleosome? Draw and describe the structure of nucleosome. 8
13. Trace the course of development of the brain in chick. 8

GROUP – C

Answer any five questions from the following : 4 × 5

14. Define hnRNA. Write its properties. 2 + 2
15. Define speciation. Give one example of sympatric speciation. 2 + 2
16. Write down the continental drift mechanism for animal distribution. 4
17. Compare protostomes and Deuterostomes. 4
18. Write brief note on "Population-bottleneck". 4
19. Calculate the frequencies of L^M and L^N alleles for two groups of individuals from the following data : 4

<u>Group</u>	<u>Sample size</u>	<u>M</u>	<u>MN</u>	<u>N</u>
A	87	58	29	4
B	266	79	64	140

20. Both human and *Drosophila* have same general sex chromosome composition (female XX; male XY). Is sex determination in both the species same ? Explain. 4

(6)

21. State the role of Leydig cell and Sertoli cell in spermatogenesis. 4
22. Explain how the polypeptides elongate on ribosome. 4
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