

**U.G. 1st Semester Examination - 2023**

**ZOOLOGY**

**[MAJOR]**

**Course Code : BZOOMAJ01C**

**Course Title : Non-chordates and Cytogenetics**

**[NEP-20]**

Full Marks : 60

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.*

1. Answer any **ten questions** from the following:

2×10=20

- a) What are the components of apical complex?
- b) Explain the advancement of the Leucon canal system over the Sycon canal system.
- c) What do you mean by an exconjugant? In which phylum of Sub-kingdom Protozoa it is observed?
- d) Name two eukaryotic cell organelles that contain genetic material.
- e) Where do you find cnidocytes? Write its function.

*[Turn Over]*

- f) What is 'Xenophore'?
- g) Mention the function of ecdysone.
- h) Differentiate between euchromatin and heterochromatin.
- i) What are the major differences between class Tentaculata and Nuda in phylum Ctenophora?
- j) What do you mean by nucleosome?
- k) Why *Peripatus* is considered as 'missing link'?
- l) Why do gastropods lack bilateral symmetry?
- m) Define epistasis.
- n) Write down the ratio of 'test cross' in  $F_2$  generation. Show the checker board and test cross ratio.
- o) What is branch migration?

2. Answer any **six** questions from the following:

$$5 \times 6 = 30$$

- a) Enumerate the control measures of *Fasciola hepatica* and *Wuchereria bancrofti*.

$$2 \frac{1}{2} + 2 \frac{1}{2} = 5$$

- b) Describe the structure of a typical gill in prawn with suitable diagram. 5

- c) Briefly discuss the characteristic features of Hemichordata and comment on its systematic position.

$$2 + 3 = 5$$

d) Write a short note on nuclear pore complex mentioning the strategies of transport of molecules through it with suitable diagram.

$$3+2=5$$

e) Write a note on metagenesis on *Obelia*. 5

f) What do you mean by multiple alleles? How do you differentiate pleiotropism and polygenic inheritance? 2+3=5

g) What is the difference between exonephric and enteronephric nephridia? Draw the diagram of the arrangement of septal nephridia of earthworm in relation to the intestine.

$$2+3=5$$

h) Briefly describe the molecular mechanism of recombination with the help of Holliday model. 5

i) State the principle of "Lyon hypothesis". State the function of SRY and SOX-9. What is 'Corpora Cardiaca'? 2+2+1=5

3. Answer any **one** question from the following:

$$10 \times 1 = 10$$

a) Describe the process of conjugation in *Paramecium* with diagram. Mention the significance of phylum Onychophora in evolution. 5+2½+2½=10

b) In which phylum we observe 'water vascular system'? What is its importance? Describe the water vascular system in starfish with suitable diagram.  $1+1+(4+4)=10$

c) In *Drosophila melanogaster* cherub wings (ch), black body(b) and cinnabar eyes(cn) are recessive to their corresponding alleles ( $ch^+b^+cn^+$ ). Homozygous wildtype flies were mated with cherub, black and cinnabar flies and the resulting F1 females were test crossed with cherub, black, cinnabar males. The following progeny was produced:

ch  $b^+cn$  = 110

ch $^+b^+cn^+$  = 780

ch $^+ b cn$  = 70

ch $^+ b^+ cn$  = 6

ch b  $cn$  = 769

ch  $b^+ cn^+$  = 60

ch $^+ b cn^+$  = 111

ch b  $cn^+$  = 9

TOTAL = 1915

Which gene is in the middle? And what is the map distance between the genes?

$$3+7=10$$