

- (b) A researcher exposes zebrafish embryos to a chemical pollutant and observes developmental defects. Explain how this experiment helps in ecotoxicology. (6,6)

5. Discuss the following : **(any three)** (3×4=12)

- (i) Ethical issues in using model organisms
- (ii) Application of *C. elegans* in ageing
- (iii) *Dictyostelium* as a model organism
- (iv) Role of vertebrate models in biomedical research

[This question paper contains 4 printed pages.]

**Your Roll No.....**

**Sr. No. of Question Paper : 7895 L**

Unique Paper Code : 3183010020

Name of the Paper : Model Organisms in  
Biomedical Research

Name of the Course : **B.Sc. (Hons) Biomedical  
Science (NEP)**

Semester : VIII

Duration : 2 Hours Maximum Marks : 60

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **four** questions in all.
3. Question No. 1 is compulsory.
4. Subparts of the questions should be attempted together.
5. Give illustrations and examples wherever required.

1. (a) State True/False and give reason for your answer  
(4×2=8)

(i) Rats are genetically identical in all laboratory strains.

(ii) Genetic screening is difficult in zebrafish due to lack of mutagenesis tools.

(iii) Nobel Prize-winning discoveries have been made using *Drosophila melanogaster*

(iv) Rabbits cannot be used for physiological studies.

- (b) Based on the following experimental scenario, select an appropriate model organism and justify your choice.  
(4×4=16)

(i) A researcher wants to produce a recombinant protein quickly and cheaply with high yield.

(ii) A researcher is studying cardiovascular physiology and drug response in a mammalian system requiring repeated sampling.

(iii) A researcher needs an easy to maintain eukaryotic system to study cell division and cell cycle checkpoints.

(iv) A researcher is investigating genes controlling body patterning and organ development.

2. With the help of well-labelled diagrams, describe the life cycle of the following model organisms.

(a) Baker's Yeast

(b) *Drosophila melanogaster* (6,6)

3. Discuss the advantages and disadvantages of using the following as a model organism :

(a) Mouse

(b) *E. coli* (6,6)

4. (a) How did finding of ced-genes in *C.elegans* play an important role in understanding the process of apoptosis across the species including humans? Discuss.