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[This question paper contains 4 printed pages.]

5. Discuss the following : (3×4=12)

Your Roll No.....

- (i) Ethical approval in animal experimentation
- (ii) *E. coli* in discovery of metabolic pathways
- (iii) Ciliates in cellular biology studies
- (iv) Use of Guinea pig in immunology studies

Sr. No. of Question Paper : 7218

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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. Question No. **1** is compulsory.
3. Subparts of the questions should be attempted together.
4. Give illustrations and examples wherever required.

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

- (i) Transgenic mice are not useful in disease modeling.
- (ii) Vertebrate models are always preferable to invertebrate models. .
- (iii) Yeast is unsuitable for studying eukaryotic processes.
- (iv) All model organisms have identical genetic systems.

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

- (i) A study focuses on screening mutants affecting cell cycle checkpoints.
- (ii) A study requires rapid genetic crosses and phenotype analysis to investigate neurodegenerative diseases

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- (iii) Study on genes involved in DNA replication with a prokaryotic system

- (iv) Research focuses on lineage studies using an invertebrate model organism.

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

(a) *C. elegans*,

(b) Baker's Yeast (6,6)

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

(a) Zebra Fish

(b) *R. norvegicus* (6,6)

4. (a) Discuss the differences between mouse and rat in terms of size, lifespan, reproduction, and suitability for biomedical research.

(b) What is Gene Disruption Project? Discuss its significance in functional genomics. (6,6)

P.T.O.