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Roll No.

FOURTH SEMESTER

B.E. (BT)

MID SEM EXAMINATION

March

2007

BT-211 MOLECULAR BIOLOGY

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer ALL questions.

Assume suitable missing data, if any.

1 Answer any FOUR parts:

- [a] Explain in detail the Meselson and Stahl experiment.
- [b] State all the differences between a prokaryotic and a eukaryotic replication system.
- [c] Explain the duplication of linear replicons with emphasis on telomeres.
- [d] Describe two different mechanisms of replication involving a single strand as a template.
- [e] Explain the mechanisms by which the nucleic acid of an adenovirus multiply.

3x4

2 Describe ONE of the following enzyme families

- (i) DNA Topoisomerases
- (ii) DNA Polymerases

3

3 Explain in detail any TWO of the following

- (i) Types of DNA damages
- (ii) Mismatch Repair
- (iii) Ames test.

2.5x2

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BT-212 GENETICS

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.

Assume suitable missing data, if any.

- 1 Explain the life cycle of E.Coli. 2
- 2 Why chromosomes are known as basis of heredity? 2
- 3 Explain cell cycle with the help of neat and labelled diagram. 3
- 4 Explain any three terms
a. Penetrance
b. Epistasis
c. Physical mapping
d. Genome
e. Oogenesis 3
- 5 Who is known as the father of genetics? How was his work discovered? Give a brief account of his experiment. 5
- 6 How is fluorescence in situ hybridization technique used for genome analysis?

OR

Explain the process of spermatogenesis with neat diagram. 5

FOURTH SEMESTER**B.E. (BT)****MID SEM EXAMINATION****March 2007****BT-214 STATISTICS FOR BIOLOGY****Time: 1 Hour 30 Minutes****Max. Marks : 20****Note : Answer ALL questions.****Assume suitable missing data, if any.**

- 1[a] Give the classical definition of probability. What are its limitations.

In a race, the odds in favour of the four horses H_1, H_2, H_3, H_4 , are 1:4, 1:5, 1:6, 1:7 respectively. Assuming that a dead heat is not possible. Find the chance that one of them wins the race.

- [b] State addition and multiplication laws of probability.

Two persons A and B fire at a target independently and have a probability 0.6 and 0.7 of destroying the target. Find the probability that the target is destroyed.

- [c] State Baye's theorem. The contents of three boxes are ; 1 white, 2 red, 3 green balls; 2 white, 1 red, 1 green balls and 4 white, 5 red, 3 green balls. Two balls are drawn from a box chosen at random. These are found to be one white and one green. Find the probability that balls so drawn came from the third box.

3,3,3

- 2[a] Define the followings, and mention their properties

- (i) Probability density function (ii) Distribution function

A function is defined as follows :

$$f(x) = \begin{cases} 0, & x < 2 \\ \frac{1}{18}(2x+3), & 2 \leq x \leq 4 \\ 0 & x > 4. \end{cases}$$

show that it is a density function. Find the distribution function. Find the probability that variable with this density function will lie in the interval $2 \leq x \leq 3$.

- [b] Define a binomial variable. Find its mean and variance.

In a bombing action there is 50% chance that any bomb will strike the target. Two direct hits are needed to destroy the target completely.

How many bombs are required to be dropped to give a 99% chance or better of completely destroying the target.

- [c] Under what conditions binomial variate tends to a Poisson variate. Give two practical situations where Poisson distribution is applicable.

A car hire firm has two car which it hires out day by day. The number of demands for a car on each day is distributed as a Poisson distribution with mean 1.5, Calculate the proportion of days.

- (i) on which there is no demand.
- (ii) on which demand is refused.

3,3,3

- 3[a] Discuss the area property of a normal variate. What are its importance in hypothesis testing?

In an examination taken by 500 candidates, the average and S.D., of marks are 40% and 10%. Find approximately

- (i) How many will pass, if 50% is fixed as a minimum?
- (ii) What should be the minimum if 350 candidates are to pass?
- (iii) How many have scored marks above 60%?

- [b] Define the problem of correlation and regression? What is the difference between the two? Why are there two regression lines? What is their point of intersection?

Following table gives the data on rainfall and discharge in a certain river.

Rainfall x (inches :	1.53	1.78	2.60	2.95	3.42
Discharge y (1000 c.c) :	33.5	36.3	40.0	45.8	53.5

Estimate the discharge when the rainfall is 2 inches.

- [c] (i) The voltage v across a capacitor at a time t seconds is given by the following table:

t :	0	2	4	6	8
v :	150	63	28	12	5.6

Use the method of least square to fit a curve of the form $v = ae^{kt}$ to this data.

- (ii) In a sample of 600 men from a certain city, 450 are found smokers. In another sample of 900 men from another city 450 are smokers. Do the data indicate that cities are significantly different with respect to the habit of smoking among men?

4,4,4

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BT-215 DATA STRUCTURE & ALGORITHMS

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer any **FIVE** questions.
Assume suitable missing data, if any.

- 1 What are the properties of an algorithm? Describe them. Why we will analyze an algorithm? What is rate of growth? 4
 - 2 Write a program to merge two arrays. 4
 - 3 What are the advantages of linked list over array? Write a program to show addition and deletion of elements in a linked list. 4
 - 4 Write a program that implements a stack using an array. 4
- OR**
- Write a program that implements a stack using linked list. 4
- 5 What is a queue? What is circular queue? What is priority queue? 4
 - 6 What is traversal of a binary tree? Describe all the methods used for binary tree traversal. 4
 - 7 Prove that in a binary tree the number of leaf nodes is one more than the number of two degree nodes. 4
 - 8 Write a program to perform addition and deletion operation on a circular queue. 4