

This question paper contains 8 printed pages]

Your Roll No.

1029

B.Sc.(Hons.)/I

C

MICROBIOLOGY—Paper V

(Biostatistics and Introduction to Computers)

(Admissions of 2004 and onwards)

Time : 3 Hours

Maximum Marks : 60

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *five* questions in all, selecting at

least *two* questions from each Section.

All questions carry equal marks.

Section A

1. (a) The following table shows the age distribution of cases of a certain disease reported during a year in a particular

P.T.O.

state :

Age	No. of Cases
05—15	05
15—25	10
25—35	20
35—45	22
45—55	13
55—65	05
<hr/>	
Total	75
<hr/>	

Compute mean and variance.

- (b) Four coins are tossed. What is the expectation of the number of heads ? 12
2. (a) Find mean and variance for the distribution with density function :

$$f(x) = \frac{1}{\pi} \left[\frac{1}{1+x^2} \right] \quad -\infty < x < \infty$$

(b) (i) Six rats are administered a certain dose of poison and the number of rats dying within 24 hours is observed. Suppose that each rat has a probability 0.25 of dying and that the survival of each rat is independent of survival of the other rats. What is the probability that :

(i) exactly four rats die.

(ii) all the rats die.

(ii) In a hospital there are 20 kidney dialysis machines and that the chance of any one of them to be out of service during a day are 0.02. Determine the probability that exactly 03 machines will be out of service on the same day. Given that $e^{-0.4} = 0.6703$.

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3. (a) In a normal distribution, 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution.

P.T.O.

- (b) Calculate coefficient of correlation between X and Y from the following data :

$$N = 15, \Sigma X = 120, \Sigma X^2 = 1300, \Sigma Y = 260, \Sigma Y^2 = 6580, \\ \Sigma XY = 2830. \quad 12$$

4. (a) The theory predicts the proportion of beans in the four groups A, B, C and D should be 9 : 3 : 3 : 1. In an experiment among 1600 beans, the numbers in the four groups were 882, 313, 287 and 118. Does the experimental result support the theory ? Given that :

Degree of freedom	5% value of χ^2
1	3.84
2	5.99
3	7.82

- (b) A random sample of 1200 men from one State gives their mean pay as Rs. 40 per month with standard deviation of Rs. 24 per month and a random sample of 1600 men

from another State gives their mean pay of Rs. 36 per month with standard deviation of Rs. 32 per month. Discuss whether the mean levels of pay of men from the two States differ ?

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Section B

5. Attempt any *six* parts of the following : $6 \times 2 = 12$

- (a) What is the difference between Levenshtein Distance and Hamming Distance ?
- (b) What do you mean by tuple and primary key of a relation in RDBMS ?
- (c) Write an algorithm to find the factorial of a number.
- (d) Convert the following from one number system to another :
 - (i) $(52.2)_{10} = ()_2$
 - (ii) $(897)_{10} = ()_{BCD}$

- (e) In MS-EXCEL, write the functions to perform the following operations :
- (i) To return the numeric equivalent of a date.
 - (ii) To find the maximum of values passed as arguments.
- (f) What is URL ?
- (g) In MS-WORD, how will you set the margins of a page in a document ?
6. (a) What is database management system (DBMS) ? What are the advantages of RDBMS ? 5
- (b) Write a flowchart to find the roots of a quadratic equation. 4
- (c) What are structure prediction databases ? Give some examples. 3
7. (a) What are the basic categories of commands used in SQL ? 4

- (b) Consider the following three relations in the database of a company :

Employee (eno*, ename, deptid, city),

Department (deptid*, deptname, manager),

Salary (eno*, basic, HRA, tax, pay*),

where primary key is marked by '*'. Write SQL statements to perform the following :

- (i) To find the manager of the employee whose name (ie ename) is "Rakhi" and employee number (ie eno) is "115". 4

- (ii) To find the total number of employees. 4

8. (a) Explain the purpose of 3rd Normal form, using example. 4

- (b) Write on any one of the following : 3

(i) BTISNET

(ii) ERNET.

- (c) The following MS-EXCEL worksheet contains the marks of various subjects in columns B, C and D, of students, where maximum marks for each subject is 60, sum of the marks of all the subjects in column E, percentage of marks of each student in column F and result (ie pass or fail) in column G where a student "pass" if the percentage is greater than or equal to 40 otherwise "fail".

A	B	C	D	E	F	G
Name	Botany	Chemistry	Zoology	Sum	Percentage	Result

If the names are entered from A3 :

- (i) Write the formula to be entered at E3.
- (ii) Write the appropriate formula to be entered at F3.
- (iii) Write the function to be entered at G3. 5