5859   *Your Roll No*

B.Sc. (Hons.)/I   **J**

MICROBIOLOGY – Paper V

(Biostatistics and Introduction to Computer)

(Admissions of 2004 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   Attempt Section **A** *and*
Section **B** *on Separate answer books*

SECTION A

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

Age	No. of Cases
10–19	04
20–29	66
30–39	47
40–49	36
50–59	12
60–69	4
Total	169

Find out mean, mode, median and standard deviation   (4×1½)

(b) A survey determined the following probabilities for a 50 years old male American

$$P(C) = 0\ 25,\ P(S) = 0\ 40,\ P(C \cap S) = 0\ 20$$

where C denotes "will contact cancer" and S denotes "smokes regularly" Find

(i) What is the probability that a person who smokes regularly will have cancer ?

(ii) What is the probability that a person who doesn't smoke will have cancer ? (6)

2 (a) The following data shows the suicides of 1096 women in 8 Punjab cities during 14 years

No of suicides in a state per year	0	1	2	3	4	5	6	7
Frequency	364	376	218	89	33	13	2	1

Fit a Poisson distribution to the above data and calculate the theoretical frequencies. Given that $e^{-1\ 18} = 0\ 3075$ (6)

(b) For the distribution with density function

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

Find mean and variance (3)

(c) Prove that the expected number of failure preceding the first success in a series of independent trails with constant probability 'p' of success in each trial is $\dfrac{1-p}{p}$. (3)

3 (a) Real Blood cell deficiency may be determined by examining a specimen of the blood under microscope Suppose that a certain small fixed volume contains an average 20 red cells for a normal person Using Poisson distribution, obtain the probability that

(i) a person will contain less than 15 red cells

(ii) a person will contain more than 20 red cells

(3)

(b) The probability that a person will die within a month after a certain cancer operation is 18% What is the probabilities that at least one person will survive (3)

(c) The weights of three-month old infants, is normally distributed with mean $\mu = 12 \cdot 4$ lb Assume that 95% of all infants weigh between 9 85 and 14 95 lb

(i) What is the standard deviation σ ?

(ii) What is the probability 'that an infant will weigh more than 13 2 lb ? (6)

P T O

·4 (a) A genetical law says that children having one parent of blood group M and the other parent of blood group N will always be one of three blood groups M, MN and N, and the average numbers of children in these groups will be in the ratio 1 2:1 The report on an experimental state as follows

Of 162 children having one M parent and one N parent, 28 4% were found to be of group M, 42% of group MN and the rest of group N 'Do the data in the report conform to the expected genetic ratio 1 2 1 Given that

Degree of freedom	1	2	3	
5% value of χ^2	3 84	5 99	7 82	(6)

(b) In a certain experiment to compare two types of pig-foods A and B, the following results of increase in weights (in pounds) were observed in pigs ·

Food A	49	53	51	52	47	50	52	53
Food B	52	55	52	53	50	54	54	53

Assuming that the two samples of pigs are independent, can it be concluded that food B is better than the food A Given that the value of t at 5% level for significance are 2 145, 2 132, 2 120 for 14, 15, 16 degree of freedom respectively

(6)

SECTION B

5   (a) Give four advantages of a DBMS.   (4)

    (b) Write the steps to copy text from one place to another place in MS-Word   (2)

    (c) Convert the following from one number system to another

       (i) $(1010110011\ 101)_2 = (\quad)_{10}$

       (ii) $(389.875)_{10} = (\quad)_2$ (4)

    (d) Describe star topology in a Computer Network

                                              (2)

6   (a) Draw a flowchart to perform the following functions

       (i) To print a table of a number x upto a multiple of 10

       (ii) To find the real roots of a quadratic equation

                                              (8)

    (b) Write about different layers of TCP/IP reference model   (4)

7   (a) Write a short note on Sequence Databases

                                              (5)

(b) What are the function of the following protocols

   (i) HTTP

   (ii) SMTP   (4)

(c) Write a short note on any **one** of the following Indian Networks

   (i) INFLIBNET

   (ii) NICNET   (3)

8   (a) Write commands for the operations (i)–(iii) based on the spreadsheet below (Assuming maximum marks in a subject can be 100)

	A	B	C	D	E	F	G
1	NAME	ROLL No	MARKS 1	MARKS 2	TOI MARKS	% OF MARKS	GRADE
2	Sohan	5	57	39			
3	Radha	9	82	54			
4	Abhishek	12	48	75			
5	Sita	14	52	77			

   (i) To calculate Total Marks

   (ii) To calculate % of Marks

(iii) To calculate GRADE based on the conditions below

% of Marks	GRADE	
≥ 60	A	
≥ 50	B	
< 60	C	(6)

(b) Write SQL statements based on the following database (Attributes for the primary key in each relation are marked by ∗)

Student(RollNo∗, StdName, Age, YearOfStudy, CourseNo)

Course(CourseNo ∗, CourseName, NoOfStudents, Teacher)

(i) Get the Teacher of the student "Sita".

(ii) Get the CourseNo and CourseName for RollNo = 4   (6)