

FIRST B.Pharm. EXAMINATION, APRIL 1990.

BIostatistics AND MATHEMATICS.

Time : Three hours.

Maximum : 75 marks.

Answer any FIVE questions.

1. (a) Resolve into partial fractions

$$\frac{2x + 7}{(x + 1)(x + 2)(x - 3)}$$

- (b) Sum to infinity the series

$$\frac{1}{1!} + \frac{1 + 2}{2!} + \frac{1 + 2 + 3}{3!} + \dots$$

- (c) Show that

$$\log_e 3 = \log_e 2 + 2 \left\{ \frac{1}{5} + \frac{1}{3} \times \frac{1}{5^3} + \frac{1}{5} \times \frac{1}{5^5} + \dots \right\}$$

(5+6+4=15 marks)

2. (a) If

$$A = \begin{bmatrix} 1 & 2 & -1 \\ 3 & 0 & 2 \\ 4 & 3 & 0 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}$$

verify that $(AB)^T = B^T A^T$.

- (b) Prove that
- $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- .

- (c) Solve :
- $x^9 - x^5 + x^4 - 1 = 0$
- .

(7+3+5=15 marks)

(a) Expand $\cos 6\theta$ in a series of powers of $\sin \theta$.

(b) Find dy/dx when

$$x + y = \sin x + \sin y.$$

(c) Differentiate $\left(\frac{x}{\sin x}\right)^7$ w.r.t. x .

(5+5+5=15 marks)

Integrate w.r.t. x

(a) $x^4(x^5 - 1)^{1/3}$

(b) $x^3 \log x$

(c) $\sin^7 x \cdot \cos x$.

(5+5+5=15 marks)

Solve :

(a) $\frac{dy}{dx} = \frac{x - y}{x + y}$

(b) $\frac{dy}{dx} + \frac{1}{x}y = \cos x$

(c) $e^x y dx + dy = 0$. (3×5=15 marks)

5. (a) What is Dispersion? Describe the various measures in common use.

(b) Calculate the mean and variance from

Values :	10	15	20	25	30
Frequency :	6	20	66	24	5

(8+7=15 marks)

7. (a) Calculate the coefficient of correlation :

X : 15 35 20 30 45 40

Y : 65 10 40 35 15 20

(b) What is the probability that the leap year 1992 will contain 53 Sundays? (8+7=15 marks)

8. (a) Describe different methods of sampling.

(b) Given $\bar{x} = 65$ $\bar{y} = 67$

$$\sigma_x = 2.5 \quad \sigma_y = 3.5 \quad \gamma_{xy} = 0.8$$

find the two lines of regression. (8+7=15 marks)

9. Write short notes on any three :

(a) Bar diagrams.

(b) Rank correlation.

(c) Random numbers.

(d) Use of statistical methods in medicine.

(15 marks)

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FIRST B.Pharm. DEGREE EXAMINATION, OCTOBER 1990.

Paper IV — MATHEMATICS AND BIostatISTICS

Time : Three hours.

Maximum : 75 marks.

Answer any FIVE questions.

1. (a) Resolve into partial fractions

$$\frac{x+1}{(x-1)^2(x-2)}.$$

- (b) Sum to infinity the series

$$1 + \frac{3}{5} + \frac{3 \cdot 7}{5 \cdot 10} + \frac{3 \cdot 7 \cdot 11}{5 \cdot 10 \cdot 15} + \dots$$

- (c) Show that

$$\log \frac{m_r}{n} = 2 \left[\frac{m-n}{m+n} + \frac{1}{3} \left(\frac{m-n}{m+n} \right)^3 + \frac{1}{5} \left(\frac{m-n}{m+n} \right)^5 + \dots \right]$$

(5+5+5 = 15 marks)

2. (a) If

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & -1 & 2 \\ 2 & 3 & -1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 3 & 2 \\ 2 & -1 & 3 \\ 3 & 2 & -1 \end{bmatrix}$$

prove that $AB \neq BA$.

- (b) Prove $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.

- (c) If $x = \cos \theta + i \sin \theta$ and $y = \cos \phi + i \sin \phi$ prove that

$$x^m y^n + \frac{1}{x^m y^n} = 2 \cos (m\theta + n\phi) \quad (5+5+5 = 15 \text{ marks})$$

3. (a) Expand $\cos^4 \theta \sin^2 \theta$ in a series of multiples of θ .

(b) Find dy/dx when

(i) $y = \frac{x}{\sqrt{1-x^2}}$

(ii) $x^3 + y^3 = 3xy$. $(5 + (2 \times 5) = 15 \text{ marks})$

4. Integrate w.r.t x

(a) $\tan^3 x \sec^2 x$

(b) $e^{x^3} x^2$

(c) $x^2 e^x$ $(5+5+5 = 15 \text{ marks})$

5. Solve

(a) $\frac{dy}{dx} = \frac{xy}{x^2 + y^2}$

(b) $\frac{dy}{dx} + \frac{3x^2 y}{x^3 + 1} = \frac{x}{x^3 + 1}$

(c) $\tan y \sec^2 x dx + \tan x \cdot \sec^2 y dy = 0$. $(5+5+5 = 15 \text{ marks})$

6. (a) Account for the predominant use of the A.M. as a measure of central tendency.

(b) Calculate the mean and standard deviation from:

Class	30—40	40—50	50—60	60—70	70—80	80—90
Frequency	18	37	45	27	15	8

$(7+8 = 15 \text{ marks})$

7. (a) Calculate the coefficient of correlation

X : 45 70 65 30 90 40 50

Y : 35 90 70 40 95 40 60

(b) A 3-digit number is chosen at random. What is the probability that the sum of the digits is 25.

$(10+5 = 15 \text{ marks})$

8. (a) Discuss the CENSUS and SAMPLE methods of collecting data in relation to merits and defects.

(b) Calculate the means and coefficient of correlation from the regression equations

$$2y - x = 50$$

$$3y - 2x = 10 \quad (8+7 = 15 \text{ marks})$$

9. Write short notes on any three:

(a) Frequency table.

(b) Ogives.

(c) Coefficient of variation.

(d) Conditional probability. (15 marks)

APRIL - 1991

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FIRST B.PHARM. DEGREE EXAMINATION, APRIL 1991.

MATHEMATICS AND BIOSTATISTICS

Time : Three hours.

Maximum : 75 marks.

SECTION A — (6 × 5 = 30 marks)

Answer any SIX questions.
All questions carry equal marks.

1. Resolve into partial fractions :

$$\frac{2x + 3}{2x(4x^2 - 1)}$$

2. Sum the series $\frac{3}{5} + \frac{3.7}{5.10} + \frac{3.7.11}{5.10.15} + \dots$ to infinity.

3. Expand $\cos 6\theta$ in powers of $\sin \theta$.

4. Find the derivative of $\sin 2x$ from first principles.

5. Evaluate $\int_0^a x \sqrt{a^2 - x^2} dz$.

6. From 25 tickets numbered one to 25, one ticket is drawn at random what is the probability that the number on it is a multiple of 3 or 7.

7. Find the coefficient of correlation given :

$$\Sigma X = 42 \quad \Sigma Y = 78$$

$$\Sigma X^2 = 342 \quad \Sigma XY = 594 \quad \Sigma Y^2 = 1080 \quad n = 6$$

APRIL - 1991

8. Calculate the variance of
22 27 32 37 42 47 52 57 62
9. Write short notes on :
(a) frequency polygon.
(b) rank correlation.

SECTION B -- (45 marks)

Answer any THREE questions.

10. (a) Define statistics and discuss its role in medicine and pharmacy.
(b) The following table gives protein intake of 400 families

Protein intake (g per person)	Number of families
15—25	30
25—35	40
35—45	100
45—55	110
55—65	80
65—75	30
75—85	10
Total	400

Calculate the mean and median. (7 + 8 = 15 marks)

11. (a) Discuss the various methods of collection of data.
(b) The serum calcium levels of 10 persons are given below. Calculate the standard deviation :

10.5	10.0	10.1	10.4	11.0
11.2	10.4	11.2	11.3	10.9

(8 + 7 = 15 marks)

12. (a) What are the various methods of taking sample from a population ?
(b) Mention the addition and multiplication laws of probability and give an example of each.
(c) Describe 'statistical inference'. Give an example for each type of statistical inference. (6 + 4 + 5 = 15 marks)

15. (a) Define Pearson's correlation coefficient. How is it measured? Mention its uses and limitations.
(b) Fit a straight line for the following data and estimate the value of Y for X = 35 :

X :	15	38	51	19	10	25
Y :	54	78	85	64	60	65

(6 + 9 = 15 marks)

APRIL - 1993

[RS 531]

FIRST B.Pharm. DEGREE EXAMINATION.

(Old and New Regulations)

Paper IV — MATHEMATICS AND BIOSTATISTICS

Time : Three hours

Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

Answer any SIX questions.

1. Resolve into partial fractions :

$$\frac{(x+1)}{(3x+2)(2x+1)}$$

2. Sum to infinity the series :

$$\frac{1}{3} + \frac{1}{2!} + \frac{1}{3^2} + \frac{1}{3!} + \frac{1}{3^3} + \frac{1}{4!} + \frac{1}{3^4} + \dots$$

(Here $n!$ denotes "factorial n ")

3. If

$$A = \begin{bmatrix} 2 & -1 & 3 \\ 1 & 0 & 2 \end{bmatrix} \text{ and } B = \begin{bmatrix} 4 & 1 & 2 \\ 0 & 1 & 3 \end{bmatrix}$$

find $3A - 2B$.

4. Show that

$$\frac{(\cos \theta - i \sin \theta)^4 (\cos 2\theta + i \sin 2\theta)^5}{(\cos 3\theta + i \sin 3\theta)^{-2} (\cos 4\theta + i \sin 4\theta)^{-3}} = 1$$

5. Expand $\sin 5\theta$ in powers of $\sin \theta$ and $\cos \theta$.
6. If $y = \sin^{-1} x$, show that $y = \log_e (x + \sqrt{x^2 + 1})$.
7. Differentiate x^3 from the first principles.
8. Evaluate : $\int \sin 3x \sin x \, dx$.
9. Solve : $\frac{dy}{dx} = \frac{x^2 + 2y^2}{xy}$.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

10. A University hospital has a record of 130 "successful" kidney transplants out of 200. Other things equal, find the probability that the next kidney transplant in this hospital will be successful.
11. Two sleep producing drugs were administered to six patients each, and the following data gives the amount of sleep (in hours) the patients had after taking the drugs.
- Drug A : 6, 2, 4, 3, 5, 2
- Drug B : 1, 6, 7, 1, 2, 6
- Compare the efficiencies of the two drugs, on the basis of co-efficient of variations.
12. Explain the importance of measures of central tendency and measures of dispersion as tools of statistical methods in pharmacy.

13. (a) Write a short note on Stratified random sampling.
- (b) Find mean, median and standard deviation for the following table of data on Protein intake/consumption/day (gm.).

Protein intake/Consumption unit/day (gm)	Number of families
15 - 24	30
25 - 34	40
35 - 44	100
45 - 54	110
55 - 64	80
65 - 74	30
75 - 85	10
	400

14. (a) Compute the coefficient of correlation from the following data :

$$\begin{aligned} n &= 10 & \Sigma XY &= 360 \\ \Sigma X &= 0 & \Sigma X^2 &= 625 \\ \Sigma Y &= 0 & \Sigma Y^2 &= 400 \end{aligned}$$

- (b) The table below gives the data obtained during a cholera epidemic :

	Attacked	Not attacked
Inoculated	31	469
Not Inoculated	185	1315

- Test the effectiveness of inoculation in preventing the attack of cholera.

NOVEMBER - 1993

[P R 149]

FIRST B. Pharm. DEGREE EXAMINATION

(Old and New Regulations)

Paper IV MATHEMATICS AND BIOSTATISTICS

Time : Three hours Maximum : 75 Marks

Answer Section A and B in separate answer books

SECTION A (6 x 5 = 30 marks)

Answer any SIX Questions

1. Sum to infinity :

$$\frac{1}{2.3} + \frac{1}{4.5} + \frac{1}{6.7} + \frac{1}{8.9} + \dots$$

2. If $A = \{1, 3, 5, 7, 9\}$ $B = \{1, 4, 7, 10\}$

and $C = \{2, 5, 7\}$, verify that

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$

3. If

$$x + y = \begin{bmatrix} 3 & 1 & 2 \\ -1 & 6 & 0 \end{bmatrix}$$

and

$$x - y = \begin{bmatrix} 1 & 7 & 0 \\ 5 & 4 & 6 \end{bmatrix}$$

Find x and y

4. Find the real and imaginary parts of

$$\frac{(2-4i)}{(1+i)}$$

5. Expand $\cos 4\theta$ in powers of $\sin \theta$

6. Show that $\cos h 2x = 1 + 2 \sin h^2 x$

7. Find $\frac{dy}{dx}$ if $y = e^{2x} \cos x$

8. Evaluate :

$$\int x e^x dx$$

9. Solve :

$$C \frac{dy}{dx} = y - 1$$

SECTION B (3 x 15 = 45 Marks)

Answer any THREE questions

10. The probability of a pregnancy resulting in a multiple birth is $\frac{1}{80}$. Find the probability of a pregnancy resulting in a single birth.

11. Write a short note on systematic sampling.

12. Describe the chief measures of central tendency. Indicate the situations in which they are suitable.

13. (a) Test of significance of the difference between the mean anxiety scores of two groups of patients for the following data :

	Group A	Group B
N	100	200
Mean	56	51
S. D.	10	10

(For significance, $Z = 1.96$ at .05 level and $Z = 2.57$ at .01 level)

(b) A sample of 500 children were classified by nutritional status and academic performance.

Academic performance	Nutritional poor	Status Good
Poor	105	15
Satisfactory	90	300

Test whether there is any relationship between Nutritional status and academic performance.

14. Find mean, median and standard deviation for the following table of data on protein intake/consumption/day (gm).

Protein intake / consumption unit / day ((gm)	Number of families
15 - 24	30
25 - 34	40
35 - 44	100
45 - 54	110
55 - 64	80
65 - 74	30

NOVEMBER - 1994

[ND 564]

First B. Pharm Degree Examination

(Old and New Regulations)

Paper IV MATHEMATICS AND BIostatISTICS

Time : Three hours Max. : 75 Marks

Answer Section A and B in separate answer books

SECTION - A (6X5=30)

Answer any SIX questions

1. Sum the series to infinity

$$1 + \frac{2^3}{2} + \frac{3^3}{3} + \frac{4^3}{4} + \dots \infty$$

2. Given that $A = \{ 0, 1, 3, 5 \}$

$B = \{ 1, 2, 4, 7 \}$, $C = \{ 1, 2, 3, 5, 8 \}$

Prove that

$$(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$$

3. If $A = \begin{pmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{pmatrix}$, show that

$$A \text{ satisfies the equation } A^2 - 3A + 2I = 0$$

4. Find the modulus and amplitude of

$$\frac{1+i}{1-i}$$

5. Express $\cos 6\theta$ as a polynomial in $\cos \theta$

6. Prove that $\sinh 3x = 3 \sinh x + 4 \sinh^3 x$

7. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ if $y = x^2 \cos x$

8. Evaluate $\int \log x \, dx$.

9. Solve the differential Equation $\sec^2 y \tan x \, dy + \sec^2 x \tan y \, dx = 0$

SECTION - B (3X15=45)

Answer any THREE questions

10. The results of Examinations in two papers A and B for 20 candidates were as follows.

8 candidates passed in paper A

7 candidates passed in paper B

8 candidates failed in both papers A and B.

If out of these candidates one is selected, what is the probability that he

i) Passed in both the papers

ii) Failed only in A

iii) Failed in A or B

11. Write short notes on stratified random sampling

12. Define Arithmetic mean and Geometric mean. Explain with suitable examples

13. The mean and standard deviation of 20 items are found to be 10 and 2 respectively. At the time of checking it was found that one item, 8 was incorrect. Calculate the mean and standard Deviation if the wrong item is replaced by 12. Give the answer correct to places after decimal.

14 Calculate the coefficient of correlation between x and y from the following data.

x :	1	3	5	8	9	10
y :	3	4	8	10	12	11

NOVEMBER - 1994

[ND 569]

FIRST B. Pharm DEGREE EXAMINATION

(Revised Regulations)

Paper IV MATHEMATICS AND BIOSTATISTICS

Time : Three hours Max : 75 marks

Answer Section A and B in separate answer books

Section - A (6×5=30)

Answer any SIX Questions.

1. Sum the series to infinity

$$\frac{1}{3} + \frac{13}{36} + \frac{135}{369} + \dots$$

2. Out of 880 boys in a college, 224 played Cricket, 240 played Hockey and 336 played Basket ball; Of the total, 64 played both basket ball and hockey; 80 played cricket and basket ball and 40 played cricket and hockey. 24 played all the three games. How many did not play any of the games.

3. Find the values of a, b, c and d that satisfy the matrix relationship

$$\begin{pmatrix} a+2 & 2b+4 \\ c+3 & 4a+4 \\ d-3 & 3d \end{pmatrix} = \begin{pmatrix} 0 & -6 \\ -3 & 2a \\ 2d+4 & -21 \end{pmatrix}$$

4. Simplify :

$$\frac{(\cos 2\theta + i \sin 2\theta)^5}{(\cos \theta + i \sin \theta)^9}$$

5. Expand $\sin 5\theta$ in powers of $\sin \theta$

6. Prove that

$$\cos h^2 x - \sin h^2 x = 1$$

7. Differentiate $y = x^x$

8. Evaluate

$$\int \frac{2x+3}{x^2+x+1} dx$$

9. Solve

$$(xy^2+x)dx + (yx^2+y) dy = 0$$

SECTION - B (3X15=45)

Answer any THREE questions.

10. The probabilities of 3 students A,B,C solving a problem in statistics are $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$. A problem is given to all the three students.

What is the probability that

- i) No one will solve the problem
- ii) Only one will solve the problem
- iii) Atleast one will solve the problem

11. Write short notes on systematic sampling

12. Define Geometric mean and Harmonic mean. Explain with suitable examples.

13. Find the standard Deviation of the following set of observations.

45, 36, 40, 37, 39, 42, 45, 35, 40, 39

14. Find the coefficient of correlation between x and y.

x : 1 2 3 4 5 6 7 8 9

y : 12, 11, 13, 15, 14, 17, 16, 19, 18

APRIL - 1995

[SB 567]

First B.Pharm Degree Examination

(Common to New & Revised Regulations)

Paper IV

Mathematics and Biostatistics

Time : Three hours

Maximum : 75 marks.

Answer Section A and B in Separate answer books

Section A (6×5=30)

Answer any SIX questions

1) Resolve into partial fractions $\frac{2x+1}{(x-1)(x^2+1)}$

2) Sum to infinity $1 + \frac{2}{6} + \frac{2.5}{6.12} + \frac{2.5.8}{6.12.18} + \dots$

3) Find the inverse of the matrix

$$\begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 0 \\ 3 & 4 & 5 \end{pmatrix}$$

4) Differentiate $(3x-2)^{\frac{1}{2}} (x+4)^{\frac{1}{2}}$

5) Evaluate $\int x e^x dx$

6) Express $\sin 5\theta$ in powers of $\sin \theta$

7) If $x+iy = \sin(u+iv)$ prove that

$$\frac{x^2}{\cosh^2 v} + \frac{y^2}{\sinh^2 v} = 1$$

8) Solve $y^2 + x^2 \frac{dy}{dx} = xy \frac{dy}{dx}$

9) Solve $\frac{dy}{dx} + y \tan x = \cos^2 x$

Section B (BIOSTATISTICS)

Answer any THREE questions.

10) Explain primary and secondary source of collection of data. Bring out their advantages and disadvantages. (15)

11) (a) Describe any three measures of central tendency. (5)

(b) Calculate the mean, median and mode for the following data of 10 Hb. levels.

10.1 12.8 10.4 8.7 11.4
 11.4 10.2 7.3 10.1 12.1 (10)

12) (a) What are the various measures of dispersion? Discuss their relative merits. (15)

13) (a) What is correlation coefficient? How is it measured? (5)

(b) Calculate the correlation coefficient between age and systolic B.P., using the given data. (10)

Age	35	45	55	65	75
Systolic B.P.	114	124	143	158	166

14) (a) When will you use test of significance? Give an example. (5)

(b) A sample of 200 patients are classified according to regularity of medication and outcome of the treatment. Is there any association between regularity of medication and the outcome of the treatment. (10)

Regularity	Outcome		Total
	good	bad	
Regular	70	50	120
Irregular	20	60	80
Total	90	110	200

(Note : 5% level of chi square distribution with 1 d.f. = 3.84)

NOVEMBER - 1995

[MB 704]

First B.Pharm Degree Examination

(Common to New & Revised Regulations)

Paper IV — MATHEMATICS AND BIO STATISTICS

Time : Three hours

Max : 75 marks

Answer Section A and B in separate answer books

SECTION - A (6×5 = 30)

Answer any SIX questions

1. Resolve into partial fractions

$$\frac{7x-1}{1-5x+6x^2}$$

2. Show that

$$\frac{\frac{1}{1!} + \frac{1}{3!} + \frac{1}{5!} + \dots}{1 + \frac{1}{2!} + \frac{1}{4!} + \dots} = \frac{e^2-1}{e^2+1}$$

3. If $A = \begin{Bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 1 & 2 & 3 \end{Bmatrix}$ and $B = \begin{Bmatrix} 1 & -1 & 1 \\ -3 & 2 & -1 \\ -2 & 1 & 0 \end{Bmatrix}$

find AB and BA

4. Simplify $\frac{(\cos 4\theta + i \sin 4\theta)^3 (\cos 3\theta - i \sin 3\theta)^2}{(\cos \theta - i \sin \theta)^7 (\cos 2\theta + i \sin 2\theta)^3}$

5. If $x+iy = \sin(A+iB)$ prove that

$$\frac{x^2}{\sin^2 A} - \frac{y^2}{\cos^2 A} = 1$$

6. Differentiate $\frac{\sin x}{x}$

7. Evaluate $\int x \log x \, dx$

8. Solve $\frac{dy}{dx} = \frac{x-y}{x+y}$

9. Solve $\frac{dy}{dx} + y \cos x = \frac{1}{2} \sin 2x$

SECTION—B
 BIostatISTICS

Answer any THREE questions

10. a) Define Population and sample. (4)
 b) Describe any three sampling procedures (11)
11. a) What is Histogram ? (3)
 b) Calculate the mean, median and mode for the following 10 Hemoglobin data.
 15.3 14.6 12.3 7.4 11.9
 11.5 10.2 11.3 11.4 11.6 (12)
12. a) What is coefficient of variation ?
 When is it used ? (4)
 b) Calculate the standard deviation for the 10 serum protein levels. (11)
 6.1 6.7 8.0 6.6 7.1
 7.1 7.2 7.0 7.4 6.8
13. a) Mention the steps involved in test of significance (5)
 b) The following data give age at onset of a disease and the result of treatment of 400 patients. Test if there is any significant association between the age at onset and the result of treatment. (10)

Age at Onset	Result of Treatment		Total
	Recovered	Not Recovered	
Up to 24 years)	146	90	236
Above 24 years	54	110	164
Total	200	200	400

14. a) Explain correlation and regression (5)
 b) Find the regression equation of systolic B.P. (y) on Age (x) using the following data. (10)

Age (x)	35	45	55	65	75
Systolic B.P. : (y)	118	136	148	160	166

APRIL - 1996

[AK 704]

Sub. Code : 4159

FIRST B.Pharm. DEGREE EXAMINATION.

Paper IV — MATHEMATICS AND BIostatISTICS

(Common to New/Revised Regulations)

Time : Three hours

Maximum : 75 marks

SECTION A — (6 × 5 = 30 marks)

(MATHEMATICS)

Answer any SIX questions.

1. Resolve $\frac{8x-4}{3x^2-2x-1}$ in to partial fractions.
2. Show that $\log_e 2 + \frac{1}{2} (\log_e 2)^2 + \frac{1}{3} (\log_e 2)^3$.
3. Prove that $A^2 - 4A - 5I = 0$. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$.
4. Expand $\sin 6\theta$ in terms of powers of $\sin \theta$ and $\cos \theta$.
5. If $\cos^{-1}(x + iy) = A + iB$, prove that $\frac{x^2}{\cos^2 A} - \frac{y^2}{\sin^2 A} = 1$.
6. Differentiate $(\sin x)^{\cos x}$.
7. Evaluate $\int x \cos x \, dx$.
8. Solve : $(1+x^2)dy - xy \, dx = 0$.
9. Solve : $\frac{dy}{dx} + y \cot x = \csc x$.

APRIL - 1996

[AK 704]

SECTION B — (3 × 15 = 45 marks)

(BIOSTATISTICS)

Answer any THREE questions.

10. (a) Explain the merits of primary and secondary data. (8)

(b) Write about any three methods of selecting sample population. (7)

11. (a) How will you draw a pie digram? When will you use it? (6)

(b) The time taken to fall asleep after taking a medicine is given for 10 cases. Calculate the standard deviation : (9)

15	35	25	20	20
40	45	30	45	35

12. (a) Explain correlation and regression. (5)

(b) Calculate the correlation coefficient between the dose and response using the following data and write its meaning : (10)

Dose	1	2	3	4	5
Response	15	20	24	41	50

[AK 704]

13. (a) Define probability and write how it is used in tests of significance. (5)

(b) A new drug was given to 150 cases and it cured 85% of them. Can we consider that it is better than the usual drug which cures 75%? (10)

14. (a) State the uses of scatter diagram. (3)

(b) A new treatment procedure was done on 60 cases and another 50 comparable persons were given the old treatment. Test if there is any association between the type of treatment and cure. (12)

	New Treatment	Old Treatment
Cured	45	30
Not cured	15	20

OCTOBER - 1997

[MS 705]

Sub. Code : 4165

FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

Paper V — MATHEMATICS AND BIostatISTICS

Time : Three hours

Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

(MATHEMATICS)

Answer any SIX questions.

1. Resolve into partial fractions $\frac{4}{x^2 - 5x + 6}$.
2. Show that $1 + \frac{1}{4} + \frac{1.4}{4.8} + \frac{1.4.7}{4.8.12} + \dots = \sqrt[3]{4}$.
3. If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{bmatrix}$, show that A satisfies the equation $A^2 - 3A + 2I = 0$.
4. Show that $\frac{(\cos 2\theta + i \sin 2\theta)^3 (\cos 3\theta - i \sin 3\theta)^4}{(\cos 3\theta + i \sin 3\theta)^2 (\cos 4\theta + i \sin 4\theta)^{-3}} = 1$.
5. Express $\frac{\sin 6\theta}{\sin \theta}$ in terms of $\cos \theta$.
6. If $A = \{1, 2, 3, 4\}$, $B = \{3, 4, 5, 6\}$ and $C = \{1, 5, 6, 7, 8\}$ verify that $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.

[MS 705]

7. Find $\frac{dy}{dx}$ if $y = e^{-x} (2x^2 - 3x + 4)$.
8. Evaluate $\int xe^x dx$.
9. Solve : $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$.

SECTION B — (3 × 15 = 45 marks)

(BIOSTATISTICS)

Answer any THREE questions.

10. (a) Discuss the various methods of collecting Primary data. (8)
- (b) A problem in statistics is given to three students *A, B, C* whose chances of solving it are $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ respectively. What is the probability that the problem will be solved? (7)
11. Find the Mean, Median and Modal ages of the married woman at first child birth.
- | | | | | | | | |
|-----------------------------------|-----|----|-----|-----|-----|-----|-----|
| Age at the birth of first child : | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| No. of Married women : | 37 | 62 | 143 | 190 | 256 | 433 | 161 |
| Age at the birth of first child : | 20 | 21 | 22 | 23 | 24 | 25 | |
| No. of Married women : | 355 | 65 | 85 | 49 | 46 | 40 | |

[MS 705]

12. Prices of a particular commodity in five years in two cities are given below :

Price in city *A* : 20 12 19 23 16

Price in city *B* : 10 20 18 12 15

From the above data find the city which has more stable prices.

13. Calculate the co-efficient of correlation and obtain the lines of regression for the following data :

X : 1 2 3 4 5 6 7

Y : 9 8 10 12 11 13 14

Obtain an estimate of *y* which should correspond to the average $\bar{X} = 6.2$.

14. A certain drug was administered to 456 males, out of a total 720 in a certain locality to test its efficacy against typhoid. The incidence of typhoid is shown below :

Find out the effectiveness of the drug against the disease.

	Infection	No infection	Total
Administering the drug	144	312	456
Without Administering the drug	192	72	264
Total	336	384	720

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[SV 705]

Sub. Code : 4165

FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

MATHEMATICS AND BIOSTATISTICS

Time : Three hours

Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

Answer any SIX questions.

(MATHEMATICS)

- $(2x^3 + 4x^2 - 14)/(x^2 - 5x + 6)$.
- Show that $1^2 + \frac{1^2 + 2^2}{\angle 1} + \frac{1^2 + 2^2 + 3^2}{\angle 2} + \dots = 47e$.
- Find $(x \ y \ z) \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix}$.
- Simplify $\frac{(\cos 4\theta + i \sin 4\theta)^3 (\cos 5\theta + i \sin 5\theta)^2}{(\cos 6\theta - i \sin 6\theta)^2 (\cos \theta - i \sin \theta)^5}$.
- Evaluate $\lim_{x \rightarrow 0} \left(\frac{1 - \cos px}{1 - \cos qx} \right)$.
- If $y = \sec^{-1} \left(\frac{x^2 + 1}{x^2 - 1} \right)$, find $\frac{dy}{dx}$.
- Integrate $x^2 \sin x$ with respect to x .
- Find the Laplace transform of $(\sin^3 \theta)$.
- Solve $(y^2 + y)dx + (x^2 + x)dy = 0$.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

(BIOSTATISTICS)

10. (a) Represent the following data by a Histogram and hence find the mode :

Marks in English :	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
No. of students :	8	20	36	15	6

(b) Calculate the coefficient of variation for the following data :

Wages in Rs.	No. of labourers
0 - 10	12
10 - 20	18
20 - 30	35
30 - 40	42
40 - 50	50
50 - 60	45
60 - 70	20
70 - 80	8
Total	230

(6 + 9)

11. (a) Find the degree of correlation by using Karl Pearson's formula for the following data of births and deaths of 15 countries during 1931 :

Birth rate :	44	24	19	33	32	16	18
Death rate :	27	11	12	24	19	11	16

Birth rate :	20	16	40	20	18	53	15	17
Death rate :	14	12	18	9	8	23	12	11

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(b) Find the two regression equations for the following data and hence estimate the yield corresponding to the rainfall 92".

Parameter	Yield in Lb/acre	Rainfall in inches
Mean	985	12.8
Standard deviation	70.1	1.6
Correlation coefficient		0.52

(7 + 8)

12. (a) Ten students are chosen at random from a class and their heights were found as under :

Student : 1 2 3 4 5 6 7 8 9 10

Height in

inches : 60 62 63 64 66 67 69 70 71 72

In the light of the above data can you confidently say that the mean height of the class is 66 inches given $t_{0.05}(9) = 2.262$.

(b) The coefficient of variation of two series are 58% and 69% and their standard deviations are 21.2 and 15.6. Find their means. (10 + 5)

13. (a) 3 persons are randomly selected from a group of 20 graduates out of which 5 are pharmacists. Find the probability that atleast one of the selected persons is a pharmacist.

(b) The probabilities of a husband and a wife surviving for 20 more years are 0.8 and 0.9 respectively. Find the probability that after 20 years :

- (i) Both of them are alive.
- (ii) Atleast one of them is alive.
- (iii) Both are not alive.

(7 + 8)

[SV 705]

14. (a) Define the terms :

- (i) Parameter
- (ii) Statistic
- (iii) Standard error
- (iv) Hypothesis.

(b) What is sampling? What are the different methods of sampling? Mention the qualities of a good random sample.

(8 + 7)

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[SM 705]

Sub. Code : 4165

FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

MATHEMATICS AND BIOSTATISTICS .

Time : Three hours

Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

(MATHEMATICS)

Answer any SIX questions.

1. $(x-1)/(x+1)(x^2+1)$.
2. Show that $\frac{2x}{1+x^2} + \frac{1}{3}\left(\frac{2x}{1+x^2}\right)^3 + \dots = \log\left(\frac{1+x}{1-x}\right)$.
3. If $A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$, show that $A^3 = A$.
4. Simplify $\left[\frac{\left(1 + \sin \frac{\pi}{8} + i \cos \frac{\pi}{8}\right)}{\left(1 + \sin \frac{\pi}{8} - i \cos \frac{\pi}{8}\right)} \right]^{1/2}$.
5. Evaluate $\lim_{\theta \rightarrow \pi/2} \frac{L^t}{\pi/2 - \theta} \left[\frac{1 - \sin \theta}{\pi/2 - \theta} \right]$.
6. If $ax^2 + 2hxy + by^2 = 1$, find $\frac{dy}{dx}$.
7. Integrate $x \cos^2 x$ with respect to x .

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8. Find the Laplace transform of $(t^2 - 1)(t + 1)$.

9. Solve : $(x^2 - 1)\frac{dy}{dx} + 2xy = 1$.

SECTION B — (3 × 15 = 45 marks)

(BIOSTATISTICS)

Answer any THREE questions.

10. (a) Draw an ogive (less than type) for the following data and hence find the median

Mid points	10	15	20	25	30	35	40
Frequencies	7	9	18	26	10	4	3

(b) Compute the Quartile deviation for the following data giving the marks of 300 students :

Marks	below 10	10-20	20-30	30-40	40-50	50-60	60-70	above 70
No. of students	5	25	40	70	90	40	20	10

(6 + 9)

11. (a) Out of 560 babies born in a hospital in a year 252 are males. If on a day 5 babies are born, what is the probability that

- (i) All the babies are females.
- (ii) Two are females.
- (iii) No female is born.

(b) Define the terms :

- (i) Sampling distribution.
- (ii) Variance.
- (iii) Standard error.

(iv) Probability.

(9 + 6)

12. (a) Calculate the Spearman's rank correlation between the marks awarded by two judges for eleven singers in a music competition. Comment on the result :

Judge A	24	29	19	14	30	19	27	30	20	28	11.
Judge B	37	35	16	26	23	27	19	20	16	11	21

(b) Find the Median and Mode for the following data :

Weight in (kg)	30-34	35-39	40-44	45-49	50-54	55-59	60-64
No. of students	3	5	12	18	14	6	2

(7 + 8)

13. (a) Find the two regression equations for the following data and estimate the value of y when x = 100 :

x	78	89	97	69	59	79	68	57
y	125	137	156	112	107	136	123	108

(b) Compare the coefficient of variation for the following distributions and hence find which one of them is a more consistent distribution.

Pay (Rs.)	400-600	600-800	800-1000	1000-1200	1200-1400	Total
Factory A						
(no. of workers)	4	18	25	2	1	50
Factory B						
(no. of workers)	10	20	42	18	10	100

(7 + 8)

14. (a) The results of IQ tests conducted to 5 students before and after they were trained are given below. Test whether the training was effective. Given $t_{0.01}(4) = 4.6$.

Candidates	I	II	III	IV	V
IQ before training	110	120	123	132	125
IQ after training	120	118	125	136	121

(b) Write a brief note on Random sampling techniques.

(9 + 6)

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[SG 705]

Sub. Code : 4165

FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

Paper V — MATHEMATICS AND BIostatISTICS

Time : Three hours

Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

Answer any SIX questions.

(MATHEMATICS)

1. Sum to infinity :

$$\frac{2}{6} + \frac{2 \cdot 5}{6 \cdot 12} + \frac{2 \cdot 5 \cdot 8}{6 \cdot 12 \cdot 18} + \dots$$

2. Show that

$$\frac{\frac{1}{1!} + \frac{1}{3!} + \frac{1}{5!} + \dots}{1 + \frac{1}{2!} + \frac{1}{4!} + \dots} = \frac{e^2 - 1}{e^2 + 1}$$

3. If $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{bmatrix}$, find the value of $A^3 - 3A + 2I$.

4. Differentiate x^n from the first principles.

5. If n is a positive integer prove that

$$(1 + i\sqrt{3})^n + (1 - i\sqrt{3})^n = 2^{n+1} \cos \frac{n\pi}{3}$$

6. Evaluate $\int x e^x dx$.

7. Evaluate $\int \frac{2x+1}{(x+2)(x-1)} dx$.

8. Solve : $\frac{dy}{dx} = \frac{x^2 + 2y^2}{xy}$.

9. Solve : $\frac{dy}{dx} + y \tan x = \cos^3 x$.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

(BIostatISTICS)

10. Explain Primary and Secondary source of collection of data.

11. Test the significance of the difference between mean anxiety scores of two groups of patients for the following data :

	Group A	Group B
Size	100	200
Mean	56	51
SD	10	12

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12. Find mean, median and mode from the following table on protein intake/consumption

Protein intake anit/day (gm)	number of families
15-24	20
25-34	40
35-44	100
45-54	20
55-64	15
65-74	5

13. (a) Explain the terms :

- (i) Mutually exclusive
- (ii) Hypothesis
- (iii) Types of errors.

(b) The odds are 5 : 3 in favour of a person who is now 30 years of age, living till he is 55 years. The odds are 2 : 3 against another person who is now 25 years of age, living he is 50 years. What is the probability that

- (i) Both of them
- (ii) Atleast one
- (iii) Exactly one will live for 25 years hence?

14. Find the two regression equations from the following data :

X	15	38	31	19	10	25
Y	54	78	85	64	60	65

Estimate the value of Y when X = 20 and the value of x when y = 70.

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[KA 705]

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FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

MATHEMATICS AND BIO-STATISTICS

Time : Three hours

Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

(MATHEMATICS)

Answer any SIX of the following questions :

1. Resolve into partial fractions : $\frac{3x+5}{(x-1)^2(x-2)}$.

2. Sum to infinity the series :

$$\frac{1}{2} + \frac{1 \cdot 3}{2 \cdot 4} + \frac{1 \cdot 3 \cdot 5}{2 \cdot 4 \cdot 6} + \dots$$

3. If $A = \begin{pmatrix} 1 & 2 & 1 \\ 3 & 0 & 2 \\ 4 & 3 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 0 & 1 & 3 \end{pmatrix}$ verify that

$$(AB)^T = B^T A^T.$$

4. If $A = \{1, 3, 5, 7, 8\}$ $B = \{1, 4, 7, 10\}$ $C = \{2, 5, 7\}$

$$\text{Verify } A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C).$$

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5. Expand $\sin 5\theta$ in powers of $\sin \theta$ and $\cos \theta$.
6. Express the following in the modulus, amplitude form $\frac{1 - i\sqrt{3}}{1 + i}$.
7. Find $\frac{dy}{dx}$ where $x^3 + y^3 = 3xy$.
8. Evaluate $\int \sin^5 x \cos x \, dx$.
9. Solve : $(1 + x^2) dx - xy \, dy = 0$.

SECTION B — (3 × 15 = 45 marks)

(BIOSTATISTICS)

Answer any THREE of the questions given below.

10. (a) Explain the primary and secondary sources of collection of data.
- (b) Draw histogram and frequency polygon for the following data :
- | | | | | | |
|------------------|-------|---------|---------|---------|----------|
| Wages (Rs.) : | 0-200 | 200-400 | 400-600 | 600-800 | 800-1000 |
| No. of workers : | 2 | 10 | 25 | 18 | 7 |
- (6 + 9)

11. Calculate mean, median and coefficient of variations from the following distribution.
- | | | | | | |
|-------------|-----|------|-------|-------|-------|
| Class : | 0-8 | 8-16 | 16-24 | 24-32 | 32-40 |
| Frequency : | 8 | 7 | 16 | 10 | 9 |
- (4 + 4 + 7)

12. (a) Explain correlation and regression.
- (b) Calculate the coefficient of correlation and obtain the regression line of x on y for the following data :
- | | | | | | | | |
|-------|---|---|----|----|----|----|----|
| x : | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| y : | 9 | 8 | 10 | 12 | 11 | 13 | 14 |
- (5 + 7 + 3)

13. (a) Write notes on simple random sampling.
- (b) From 25 tickets numbered 1 to 25, one ticket is drawn at random. What is the probability that the number on it, is a multiple of 3 or 7? (8 + 7)
14. (a) A new drug was given to 150 cases and it cured 85% of them. Can we consider that it is better than the usual drug which cures 75%.
- (b) In an experiment on immunization of cattle against tuberculosis, the following results were obtained :

	Attacked	Not attacked
Inoculated	12	28
Not inoculated	13	7

Examine the effect of the vaccine in controlling the disease. Note 5% level of χ^2 with 1 df = 3.84. (7 + 8)

[KB 705]

Sub. Code : 4165

FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

Paper V — MATHEMATICS AND BIostatISTICS

Time : Three hours Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

(MATHEMATICS)

Answer any SIX questions.

1. Resolve into partial fractions $\frac{x+1}{(x-1)^2(x+2)}$.
2. Sum to infinity $1 + \frac{2}{6} + \frac{2 \cdot 5}{6 \cdot 12} + \frac{2 \cdot 5 \cdot 8}{6 \cdot 12 \cdot 18} + \dots$
3. Find the inverse of the matrix $\begin{pmatrix} 1 & 2 & 3 \\ 2 & 4 & 0 \\ 3 & 4 & 5 \end{pmatrix}$.
4. Given that $A = \{0, 1, 3, 5\}$, $B = \{1, 2, 4, 7\}$ and $C = \{1, 2, 3, 5, 8\}$. Prove that :
 - (a) $(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$.
 - (b) $(A \cap B) \cup C = (A \cup C) \cap (B \cup C)$.
5. Expand $\cos 4\theta$ in powers of $\sin \theta$.

6. Simplify

$$\frac{(\cos 2\theta + i \sin 2\theta)^3 \cdot (\cos 3\theta - i \sin 3\theta)^4}{(\cos 3\theta + i \sin 3\theta)^6 \cdot (\cos 4\theta + i \sin 4\theta)^2}$$

7. Differentiate $\frac{\sqrt{x}}{2x+3}$ with respect to x .

8. Evaluate $\int x \sec^2 x \, dx$.

9. Solve : $y^2 + x^2 \frac{dy}{dx} = xy \frac{dy}{dx}$.

SECTION B — (3 × 15 = 45 marks)

(BIostatISTICS)

Answer any THREE questions.

10. (a) What do you mean by classification of data? Describe any two methods of classification with example.

(b) Draw Histogram and Frequency curve from the following data :

Class interval :	30-40	40-50	50-60	60-70	70-80	80-90
Frequency :	18	37	45	27	15	8

(7 + 8)

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11. The length of 200 parasites in the human blood were measured to the nearest micron given in the following table. Calculate Mean, Median, Mode and coefficient of variation.

Length :	10-19	20-29	30-39	40-49	50-59	60-69	70-79
Frequency :	32	42	40	56	20	6	4

(3 + 3 + 3 + 6)

12. (a) What is correlation? How is it measured?

(b) Calculate the correlation coefficient and write down the regression equations for the following data :

$$n = 6, \Sigma X = 42, \Sigma Y = 78, \Sigma X^2 = 342, \Sigma Y^2 = 1080$$

$$\text{and } \Sigma XY = 594.$$

(4 + 5 + 6)

13. (a) Write notes on systematic random sample.

(b) A three digit number is chosen at random. What is the probability that the sum of the digits is

(i) 20 and (ii) 25. (6 + 9)

14. (a) In a large city 25% of a random sample of 900 school children had defective eye sight. In another large city 15% of a random sample of 1600 school children had the same eye defect. Is this difference significant? Give that 5% Z value is 1.96 and 1% Z value is 2.58.

(b) A certain drug was administered to 456 males, out of a total 720 in a certain locality. The incidence of typhoid is given below :

	Infection	Typhoid No Infection	Total
Administered the drug	144	312	456
Not administered the drug	192	72	264
Total	336	384	720

Find out the efficacy of the drug against the Typhoid.

Given that 5% χ^2 value for 1 d.f. = 3.84.

(7 + 8)

[KC 705]

Sub. Code : 4165

FIRST B.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

Paper V — MATHEMATICS AND BIOSTATISTICS

Time : Three hours

Maximum : 75 marks

Answer Sections A and B in separate answer books.

SECTION A — (6 × 5 = 30 marks)

(MATHEMATICS)

Answer any SIX questions.

1. Resolve into partial fractions

$$\frac{2x + 7}{(x + 1)(x + 2)(x - 3)}$$

2. Show that

$$1 + \frac{1}{4} + \frac{1 \cdot 4}{4 \cdot 8} + \frac{1 \cdot 4 \cdot 7}{4 \cdot 8 \cdot 12} + \dots = \sqrt[3]{4}$$

3. If $A = \begin{bmatrix} 3 & 1 & -1 \\ 0 & 1 & 2 \end{bmatrix}$ find AA^T and $A^T A$.

4. If $A = \{1, 3, 5, 7, 9\}$, $B = \{1, 4, 7, 10\}$ and $C = \{2, 5, 7\}$ verify that

(a) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

(b) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.

5. Find the real and imaginary parts of $\frac{z - 4i}{1 + i}$.
6. Show that $\frac{\sin 6\theta}{\sin \theta} = 32 \cos^5 \theta - 32 \cos^3 \theta + 6 \cos \theta$.
7. Differentiate $(\sin x)^{\cos x}$ with respect to x .
8. Evaluate $\int x^3 \log x \, dx$.
9. Solve $\frac{dy}{dx} = \frac{x + 2y - 3}{2x + y - 3}$.

SECTION B — (3 × 15 = 45 marks)

(BIOSTATISTICS)

Answer any THREE questions.

10. (a) Describe any two methods of collecting primary data.

- (b) Calculate Mean, Median and Mode for the following data of 10 Hb levels

10.1, 12.8, 10.4, 11.4, 8.7, 10.2, 11.4, 7.3, 10.3, 12.1.

(15)

11. (a) Calculate Quartile Deviation for the following table of data on protein intake per day.

Protein intake per day	: 5-19	20-34	35-49	50-64	65-79
Number of families	: 6	20	45	24	5

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[KC 705]

(b) Calculate the Combined Mean and Standard deviation from the following data :

Group	Mean	Standard deviation	Number
Boys	70	5	300
Girls	60	4	200

(8 + 7)

12. Calculate the coefficient of correlation and obtain the lines of regression for the following data :

X:	1	2	3	4	5	6	7
Y:	9	8	10	12	11	13	14

Obtain an estimate of X when $Y = 20$. (15)

13. (a) Write down the statements of Addition and Multiplication Theorems on probability for any two events.

(b) Find the probability of throwing 10 with two dice.

(c) Describe stratified random sampling method. (3 × 5 = 15)

14. (a) A new drug was given to 150 cases and it cured 85% of them. Can we consider that it is better than the usual drug which cures 75%. Given 5% Z value is 1.96 and 1% Z value is 2.58.

(b) Test for the significance difference between the mean anxiety scores of two groups of patients for the following data :

	Group	
	A	B
Number	100	200
Mean anxiety scores	56	51
S.D. scores	10	10

5% Z value is 1.96

1% Z value is 2.58.

(7 + 8)