

16356(J) 516

B. Pharmacy 2nd Semester Examination

Maths & Biostatistics (CBS)

BP-205

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions selecting one each from section ABCD. Question 9 section E is compulsory.

SECTION - A

1. (a) Find the adjoint of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 2 \\ 3 & 3 & 4 \end{bmatrix}$ (6)

(b) Use matrix method to solve the system of equations.

$$2x + y - z = 1$$

$$x - 3y + z = 2$$

$$7x + y - 2z = 5$$

(6)

2. (a) Find the values of 'a' and 'b' so that the function defined by

$$f(x) = \begin{cases} 5 & \text{if } x \leq 2 \\ ax + b & \text{if } 2 < x < 10 \\ 21 & \text{if } x \geq 10 \end{cases}$$

is a continuous function.

(6)

(b) Evaluate $\lim_{x \rightarrow a} (x - a) \cos \frac{1}{(x - a)}$ (6)

[P.T.O.]

SECTION - B

3. (a) If $f(x) = \log (\sin x)$. Find $f^{iv}(x)$. (6)

(b) Let $f(x) = \begin{cases} 2x + 3 & , x \leq 1 \\ ax^2 + bx & , x > 1 \end{cases}$

If $f(x)$ is everywhere differentiable then prove that $f'(2) = -4$. (6)

4. (a) Represent the following data by means of a histogram

Weekly wages ('00Rs):	10-15	15-20	20-25	25-30	30-40	40-60	60-80
No. of workers:	7	19	27	15	12	12	8

(6)

(b) Find the Mode, Median from the following data:

Class	f	Class	f
0-2	8	25-30	45
2-4	12	30-40	60
4-10	20	40-50	20
10-15	10	50-60	13
15-20	16	60-80	15
20-25	25	80-100	4

(6)

SECTION - C

5. (a) Find the mean and standard deviations of the following data:

Age under (years):	10	20	30	40	50	60	70	80
No. of persons lying:	15	30	53	75	100	110	115	125

(6)

(b) The means of two samples of sizes 50 and 100 respectively are 54.1 and 50.3 and the standard deviation are 8 and 7. Obtain the standard deviation of the sample of size 150 obtained by combining the two samples. (6)

6. (a) Calculate Karl Pearson's coefficient of skewness:

Measurement:	10	11	12	13	14	15	
Frequency:	2	4	10	8	5	1	(6)

- (b) Calculate Bowley's coefficient of skewness of the following data:

Weight (lbs)	No. of persons	Weight (lbs)	No. of persons
Under 100	1	160-169	31
100-109	14	170-179	12
110-119	66	180-189	5
120-129	122	190-199	2
130-139	145	200 and over	2
140-149	121		
150-159	65		(6)

SECTION - D

7. (a) Compute the correlation coefficient between the corresponding values of x and y in the following table.

x	2	4	5	6	8	11	
y	18	12	10	8	7	5	(6)

- (b) From the following data obtain the two regression equations:

Sales:	91	97	108	121	67	124	51	73	111	57
Purchases:	71	75	69	97	70	91	39	61	80	47

(6)

8. (a) Test the hypothesis that $\sigma=10$, given that $s=15$ for a random sample of size 50 from a normal population. (6)
- (b) The mean weekly sales of surf excel in departmental store was 146.3 packs per store. After an advertising campaign the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a standard deviation of 17.2. Was the advertising campaign successful? (6)

[P.T.O.]

SECTION - E

9. (a) Define inverse of a matrix.
- (b) Define discontinuity of 1st kind.
- (c) $\lim_{x \rightarrow \pi} \frac{\sin 3x}{\sin x} = \dots\dots\dots$
- (d) Find $\frac{d^2y}{dx^2}$ if $x = at^2$, $y = 2at$
- (e) What are the advantages of data classification?
- (f) What do you understand by arithmetic mean? Discuss its merits.
- (g) What is measure of dispersion?
- (h) Define Karl Pearson's coefficient of correlation.
- (i) Distinguish between correlation and regression analysis.
- (j) Give two lines of regression, explain how you will find b_{yx} and b_{xy} .
- (k) The calculated value of χ^2 is
- (a) always +ive (b) always -ive
- (c) can be either +ive or -ive (d) none of these
- (l) Students t-distribution was discovered by
- (a) Karl Pearson (b) Laplace
- (c) Fisher (d) Gosset

(1×12=12)