

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2022
HONOURS IN MATHEMATICS
GMAH1B03T: PROBABILITY AND STATISTICS

Time: 3 Hours

Maximum Marks: 80

PART A: Answer all the questions. Each carries 1 mark
Choose the correct answer.

- In a frequency distribution of a large number of values, the mode is:
 - Largest observation
 - Smallest value
 - Observation with maximum frequency
 - Maximum frequency of an observation
- Geometric mean of regression coefficients will be....
 - Coefficient of regression
 - Coefficient of correlation
 - Coefficient of determination
 - Coefficient of non-determination
- For comparison of two different series the best measure of dispersion is:
 - Mean deviation
 - Quartile deviation
 - Standard deviation
 - Range
- From a study related to degree of association, the coefficient of correlation was equal to 0.92. It means that there is :
 - Very high positive correlation
 - Very high negative correlation
 - No correlation
 - Perfect positive correlation
- The two regression lines are mutually perpendicular when $r =$
 - 0
 - 1
 - +1
 - 0.8

Fill in the Blanks.

- If A and B are independent events such that $P(A) = P(B) = 1/3$, then $P(A \cup B) =$
- If $Q_1 = 20$ and $Q_3 = 60$, then QD is.....
- A random variable X has the p.d.f $f(x) = k, 0 < x < 1$. Then the value of k is.....
- If $F(x) = \frac{x^2}{25}; 0 < x < 5$
then its pdf $f(x) =$
- If $f(x) = \begin{cases} \frac{1}{b-a}, & a \leq x \leq b \\ 0, & \text{otherwise} \end{cases}$ then the distribution function is

(10 x 1 = 10 Marks)

(PTO)

PART B: Answer any eight questions. Each carries 2 marks

11. For a moderately asymmetrical distribution Mean and Mode are respectively 12 and 15.1. Find median.
12. Calculate MD about Mean of 6, 13, 11, 8, 12, and 22.
13. A computer while calculating the correlation coefficient between two variables X and Y from 25 pairs of observations obtained the following results.

$$n = 25, \sum X = 125, \sum Y = 100, \sum X^2 = 650, \sum Y^2 = 436, \sum XY = 520$$

Find the correlation coefficient.

14. If $b_{yx} = 0.54$, $r = 0.75$, SD of $y = 7$, find SD of x .
15. Given the regression lines to be $2x + 18y = 326$ and $x + 2y = 33$. Find mean of x and Y .
16. In a box there are 6 white balls, 5 green and 4 red balls. Out of them 3 are chosen at random. Find the chance that they all belong to different varieties.
17. A purse contains 2 red balls and 5 white balls and a second purse contains 5 red and 4 white balls. If a ball is selected from one of the purse. What is the probability that it is a white ball?
18. Examine whether the following is a distribution function

$$F(x) = \begin{cases} 0 & , x < -a \\ \frac{1}{2} \left(\frac{x}{a} + 1 \right) & , -a \leq x < a \\ 1 & , x > a \end{cases}$$

19. Find the p.m.f of $Y = X^2$, when the p.m.f of X is as follows :

$X = x$	- 2	- 1	0	3
$P(X = x)$	1/4	1/4	1/4	1/4

$$20. \text{ Given } f(x) = \begin{cases} \frac{x^2}{9}, & 0 < x < 3 \\ 0, & \text{otherwise.} \end{cases}$$

Find the density of $Y = X^3$

(8 x 2 = 16 Mar)

PART C: Answer any six questions. Each carries 4 marks

21. Compute harmonic mean for the following data:

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Frequency	14	16	10	12	6	4

22. Obtain the equation of the lines of regression for the data given below :

X	1	2	3	4	5	6	7	8	9
Y	5	4	5	6	7	2	9	8	3

