

ADMISSION NUMBER											

School of Basic Sciences
Bachelor of Science Honours in Mathematics
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem III - C1UC303B - Mathematical Statistics

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) Explain moment generating functions in the continuous and discrete distribution. K2 (2)
- 2) If two coins are tossed simultaneously. Let X be the head on the up face, find its probability mass function and its distribution. K1 (3)
- 3) Let a X random variable and its probability mass function is given by K2 (4)

x:	1	2	3	4	5
P(X = x):	0.3	0.1	0.1	0.3	0.2

 Estimate the value of X
- 4) If M is the mgf and x is random variables then show that K2 (6)

$$M_{x_1+x_2+x_3} = M_{x_1} M_{x_2} M_{x_3} .$$
- 5) If the sum of the mean and the variance of binomial distribution of 5 trials are 4.8, develop the binomial distribution. K3 (6)
- 6) Let Z is a standard normal variable. Find $P(Z < 1.2)$ and $P(Z > -1.2)$. K3 (9)
- 7) Find the value of $P(X=3)$ if X is the discrete random variable taking values x_1, x_2, x_3 where $P(X=0)=0, P(X=1) = 1/4$ and $P(X=2) = 1/4$. K4 (8)
- 8) A student obtained the following answer to a certain problem given to him. Mean=2.4; Variance=3.2 for a binomial distribution. Analyze the consistency of results. K4 (12)

OR

- Is the binomial distribution possible whose mean is 9 and variance 9/4. K4 (12)