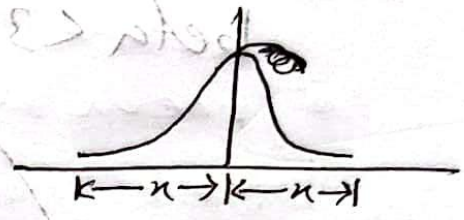
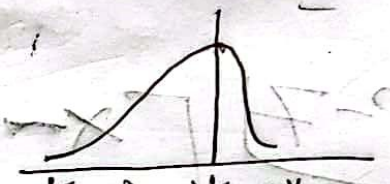
Part - B

5) Skewness বলতে Given Distribution symetric কিনা তা বুঝায়।

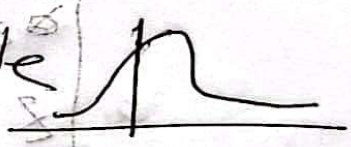
Skewness = 0
- mean = median = mode
- গ্রাফের দুইদিক সমান হবে,
- M_3 = 0 (তৃতীয় মোমেন্ট)



Skewness < 0
- Mean < Median < Mode
- গ্রাফের বামদিক বড় হবে,
- M_3 = Negative



Skewness > 0
- Mean > Median > Mode
- গ্রাফের ডান দিক বড় হবে
- M_3 = Positive



$$\frac{m_3}{\sqrt{m_2^3}} = \frac{\sum\{(x-\mu)^3 \times P(x)\}}{\sqrt{m_2^3}}$$

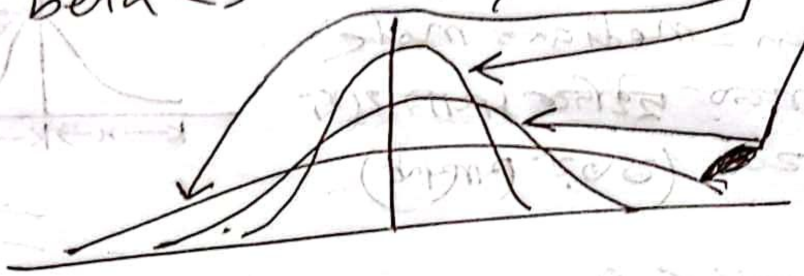
μ = expected value of x, $P(x)$ = probability of x

$$\frac{m_3}{N \times \sigma^3} = \frac{\sum f_i (x_i - \bar{x})^3}{N \times (\text{Standard dev.})^3}$$ (group এর ক্ষেত্রে)

Kurtosis: $\frac{m_4}{N \times \sigma^4} = \frac{\sum f_i (x_i - \bar{x})^4}{N \times \sigma^4}$ (group)

$$\frac{m_4}{\sqrt{m_2^4}} = \frac{m_4}{m_2^2} = \frac{\sum (x-\mu)^4 \times P(x)}{m_2^2}$$

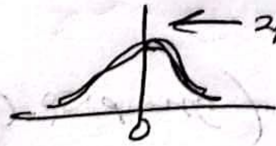
beta2 = 3 → mesokurtic
beta2 > 3 → Leptokurtic
beta < 3 → Platykurtic



P-7) X ~ N(1000, 250000)
এখানে, X হলো Normal distribution, যার mean, 1000 এবং variance 250000

Z ~ N(0,1)
Z হলো Normal distribution, $\mu = 0$, Var(Z) = 1

(i) Pdf of Z = P(Z) = NORM.S.DIST (Z, FALSE)

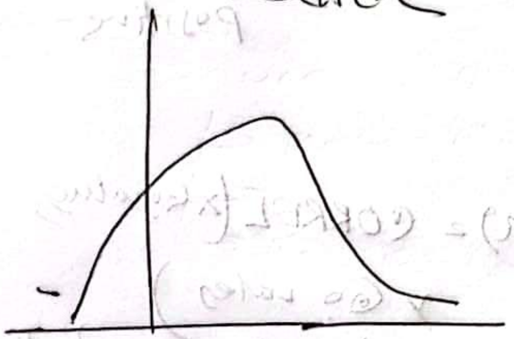


← আমরা জানি Z এর mean 0 হওয়াতে এটা একটা symmetric এবং mesokurtic

(ii) $Z = \frac{X-\mu}{\sigma}$ ← mean, standard deviation
$X = \mu + Z*\sigma$

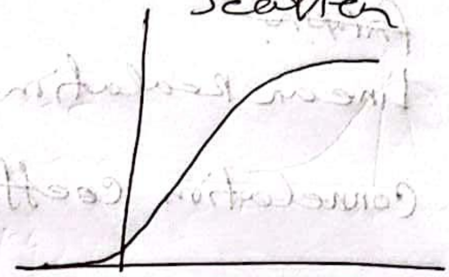
Pdf P(X) = NORM.DIST(X, μ, σ, FALSE)
cdf F(X) = NORM.DIST (X, μ, σ, TRUE) [∴ cdf = Cumulative distribution function]

(14) pdf, $\frac{X + P(X)}{\text{Scatter}}$



Positively skewed হবে
বামদিকে বড়

cdf $\frac{X + F(X)}{\text{Scatter}}$



ogive এর মত, বাড়তে থাকবে, অর্থাৎ উপরে উঠবে পর্যন্ত শেষ হবে

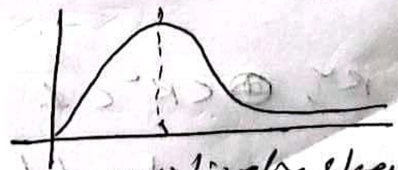
P-81 Poission distribution, $\frac{e^{-\lambda}\lambda^{x}}{x!}$ λ = mean

(i) mistake (X), No. of pages(f) = fx, Σfx

lemda = $\frac{\Sigma fx}{\Sigma f}$ = $\frac{\Sigma fx}{500}$

P(X) = POISSON.DIST(X, lemda, FALSE)

(ii) $\frac{X + P(X)}{\text{scatter}}$,



→ positively skewed
→ thickness এবং তুলনা leftto kurtic হতে পারে

(iv) Recurrence Relation,
1st value P(X) এর টা, / =(lemda/X)* P(X) উপরের সেলের
P(X) এবং P(X).R সমান হবে

3)(i) • positive দিকে আছে কিনা, Relationship positive

~~[illegible]~~

• Linear Realation আছে

(ii) Correlation coefficient $(r) = CORREL(x$ এর values, y এর values$)$

$= 0.9$ তাই strongly positive linear relation between x and y

(iii) intercept $= \alpha$

x variable 1 $= \beta$ এর মান

Best fitted line $= \alpha + \beta$

(iv) Weekly income 175

$Y_{175} = \alpha + \beta \times 175$

(v) R^2 1 এর কাছাকাছি তাই good fitted.

$-1 < R < 1$, R^2, $0 < R^2 < 1$

তাই income expenditure কে ভালোভাবে control করেছে