

Rubric : Assignment - 2 :-

1. Finding lag 1 ACF for MA(1) (0.25)
Finding the extreme points (0.5)
Showing how absolute is bounded (0.25)

- 2.
- a) Proving by induction or recursive relation (0.5)
- b) showing the operation of $E(\sum c_j w_j)$
$$= \sum c_j E(w_j) = 0$$

(0.5)
- c) Finding $\text{var}(x_t)$ with simplified (0.5)

expression.

(0.5)

d) Finding $\text{Cov}(X_t, X_{t+h})$ with simplified expression.

(0.5)

e) Just saying that any of the above depends on t .

(0.5)

f) Finding out the limiting expression of c) and d) which are independent of t .

(0.5)

g) Comment on how to draw from white noise $W_t \stackrel{\text{iid}}{\sim} N(0, \sigma_w^2)$ by using iid $N(0, 1)$ samples.

(0.25)

Comment on how to draw from X_t by using W_t .

(0.25)

h) Finding the right expression of expectation, variance and covariances, and comment not being function of t .
(0.5)

3.

Writing the roots of corresponding polynomial correctly and their conditions. (0.5)

Finding the conditions based on ϕ_1 and ϕ_2 correctly in simplified expression. (0.5)

4. Finding roots of AR polynomials correctly. (0.5)

(Showing ACF functions correctly without (0.5))

plot

(0.25)

Plotting the ACF's correctly (0.25)

OR

Writing correct code for plotting ACF.

(0.25)

Showing the plots correctly (0.25)

5.

Identifying the parameter redundancy
by successful factorization (0.5)

Determining the condition for causality (0.25)

checking the condition for invertibility (0.25)

6.

Just plotting the three series on same graph with correct code. (0.5)

Comment on diagnostic capabilities (0.5)

7. Generating 1000 samples and showing correct ACF and PACF plots. (0.5)

Comment on their patterns. (0.5)