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5(a) mean. — 2 1/2

Autocorrelation 2 1/2

b) ~~pro~~state — 2M.

proof. — 3M.

OR

6(a) each definition 1M.

b) $R_x(\tau) = E[x(t+\tau)\, x(t)]$

$R_x(0) = E[x(t)\, x(t)] = E[x^2(t)]$

$y(t) = x^2(t)$

$R_x(0) = E[y(t)]$

$R_x(0) =$ mean of $y(t)$

— 5M.

Q1 a) $f_s = 1.2 \times 2 f_m = 36\,KHz$ — 1 m

$r = Nf_s = 16 \times 36\,KHz$ — 2 m.

$= 576$ kbps

$B_T = \frac{576}{2} k = 288\,KHz$ — 2 m.

b) block dig — $2\frac{1}{2}$

Explaination — $2\frac{1}{2}$

Q2 a) $f_m = \frac{500}{2\pi} = 79.58\,Hz$ — 1 m

$f_{s\min} = 159.16\,Hz$ — 1 m

$T_{s\max} = \frac{1}{f_{s\min}} = 6.28\,msec$ — 1 m

Number of Samples $= \frac{1}{6.28\,msec} = 159.16$ samples — 2 m.

Q2 b) necessity of companding — 2 m.

Alaw.
graph
Expression } 3 m.

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3(a) AT & T Diagram. — 2 Marks
Explanation — 3 Marks

b) Properties — 2 Marks
PSD — 3 Marks.

OR

Q4(a) ISI → 2M.
Soln → 3M.

b) Table. → 4 Marks
O/P = 01011011010 - 3 Marks