1. DM system:
   (a) Draw the block diagram of DM system.
   (b) Briefly describe what slope-overload distortion and granular noise are.

Sol:
(a) 
Tx: 

(b) Slope overload distortion
   - To eliminate the slope overload distortion, it requires

\[
\frac{\Delta}{T_s} \geq \max \left| \frac{dm(t)}{dt} \right| \quad \text{(slope overload condition)}
\]
Granular noise

- $m_q[n]$ will hunt around a relatively flat segment of $m(t)$.
- A remedy is to reduce the step size.

2. TDM system:
   (a) Draw the block diagram of TDM system

Sol:

3. Delta-sigma modulation system:
   (a) Draw the block diagram of Delta-sigma modulation
   (b) Explain the function of each block in (a)
   (c) Illustrate the advantage of the Delta-sigma modulation compared with DM system.

Sol:
(a) 

(c) receiver design is further simplified