

Mid Solution:

Q. 1

(a) (i) ZigBee / 6LoWPAN

(ii) WiMax

(iii) PMU consist of voltage phasor, current phasor and information such as location, other network parameters.

- Precise phasor measurement allows an operator to visualize exact angular difference between different locations, situational awareness & ease congestion.

- PMUs also equipped with GPS receivers, allow synchronization of reading, taken at distance points.

- All instrumentation and protection relays are incorporated within PMU Modules.

→ So in Distribution System PMU will help for

- (i) Wireless measurement
- (ii) Protection and diagnosis of fault
- (iii) Location

(b)

Upper layers of Source
Network
LLC
MAC
Physical

Bridge

LLC	
MAC	MAC
Physical	Physical

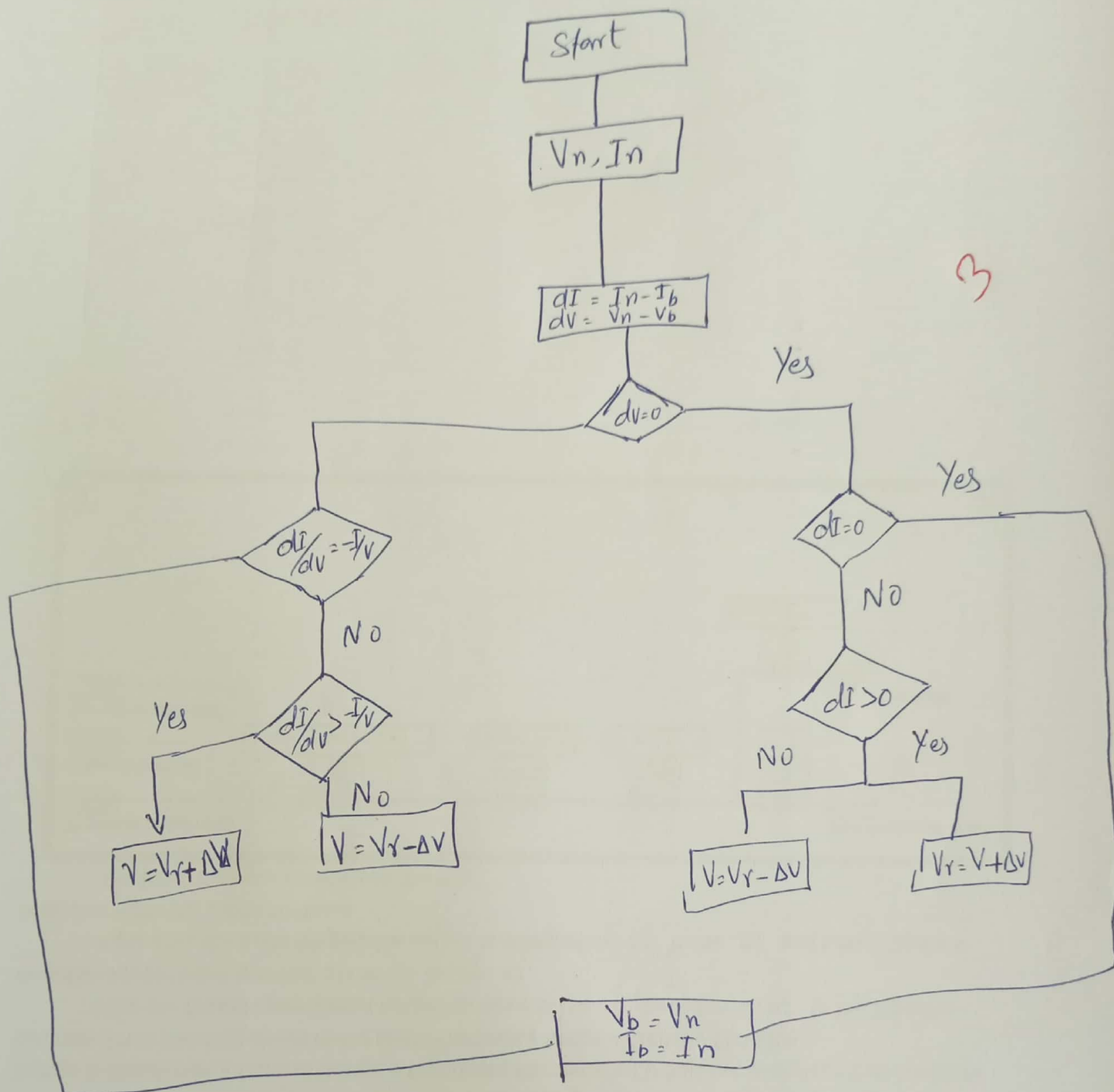
Upper layer destination
Network
LLC
MAC
Physical

It is IEEE 802 architecture and represent how LAN may be connected through bridge.

LLC is bridge b/w network and MAC layers.

LLC provides multiplexing mechanisms, flow control and error control.

Q=2
(A)



Q=2(b)

The main reason is MPPT Techniques are extracting the maximum Power Point by changing duty cycle, while to fix the voltage of Converter PI controller may be used. ✓

Q=2(c)

✓

$$V_o/V_s = D/(1-D) = \frac{-18}{12}$$

$$\boxed{D = 0.6}$$

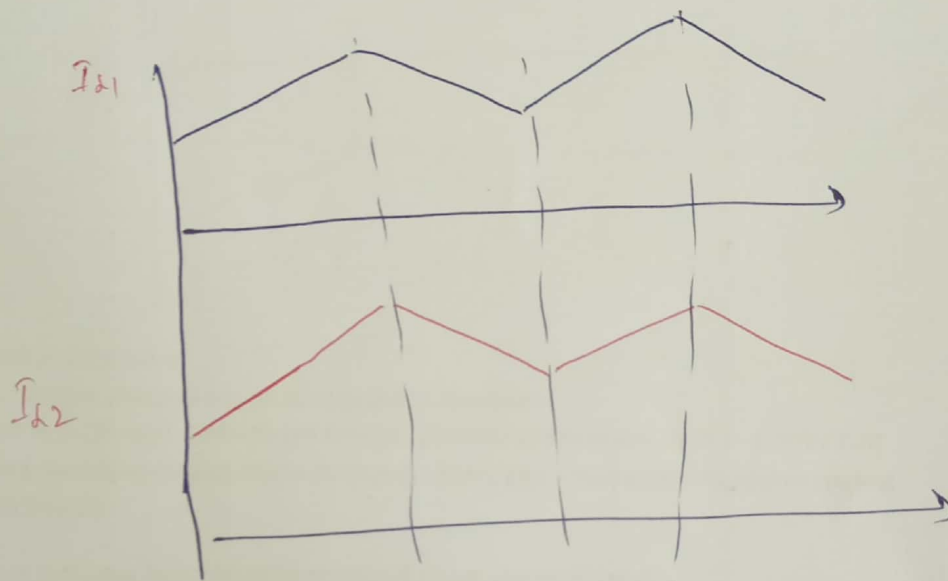
$$I_{L2} = \frac{P_o}{-V_o} = \frac{40W}{18V} = 2.22 A$$

$$I_{L1} = \frac{P_s}{V_s} = \frac{40W}{12V} = 3.33 A$$

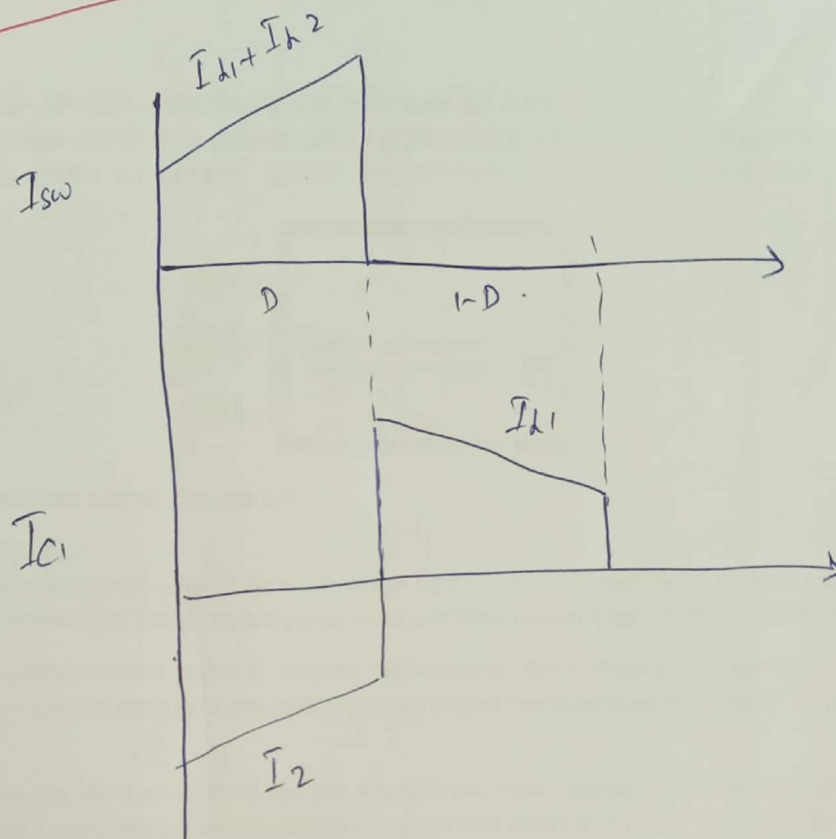
$$\Delta I_L = \frac{V_s D}{Lf}$$

$$L_2 \geq \frac{V_s D}{f \Delta I_{L2}} = 649 \mu H$$

$$L_1 \geq \frac{V_s D}{f \Delta I_{L1}} = 432 \mu H$$



$$\underline{d = 2(D)}$$



✓

Q.2(E)

$$V_{abc-dav} = \sqrt{2/3} \begin{bmatrix} 1 & -1/2 & -1/2 \\ 0 & \sqrt{3}/2 & -\sqrt{3}/2 \end{bmatrix} \begin{bmatrix} -250 \\ 200 \\ 50 \end{bmatrix}$$

$$V_x = \sqrt{2/3} \begin{bmatrix} -375 \\ 129.9 \end{bmatrix} = \begin{bmatrix} -306.2 \\ 106 \end{bmatrix}$$

$$|V_x| = 324.1$$

$$\phi = -19.11$$

$$U = .54$$

$$t_b = .20 \times 100 \times 10^{-6} = 20.56 \mu s$$

$$t_a = .611 \times 100 \times 10^{-6} = 61.182 \mu s$$

$$t_o = 18.9 \mu s$$

