

Q. 3 Consider an AM signal,

**(5x2=10 marks)**

$$X(t) = 5 (1 + 0.7 \sin 2\pi f_m t) \cos 2\pi f_c t$$

$$f_m = 1 \text{ k Hz}, f_c = 200 \text{ k Hz}.$$

- (i) Determine the average sideband power for the given signal.
- (ii) Determine the total power.
- (iii) Determine bandwidth of the AM signal.
- (iv) Determine the frequency of USB and LSB and plot the spectrum.
- (v) Determine power efficiency for the given signal.