m(t) and c(t) is as given below

$$m(t) = 0.2sin\,(2\pi 1500t) + 0.1sin\,(2\pi 2500t)$$
$$c(t) = 4sin\,(\pi 10^6 t)$$

Total Power transmitted is * 2 points

- [ ] 8.02W
- [ ] 8.2W
- [x] 8.0125W
- [ ] 9.5W

Side band power is * 2 points

- [ ] 200mW
- [x] 12.5mW
- [ ] 1.25W
- [ ] 20mW

Bandwidth of the transmitted signal * 2 points

- (●) 5K
- ( ) 3K
- ( ) 8K
- ( ) 1.5K

Mention USB frequencies respectively * 2 points

- ( ) 1001.5K & 1002.5
- ( ) 1010.5K & 1020.5
- ( ) both A andB
- (●) None

Net Modulation Index is * 2 points

- ( ) 0.025
- ( ) 0.3
- (●) 0.0559
- ( ) 0.003125

Q2. An AM transmitter radiates 50kW carrier power.

Upload the solution along with Descriptive section answers

What will be the total radiated power at 50% modulation index. * 2 points

- (●) 56.25kW
- ( ) 68.06kW
- ( ) 75kW
- ( ) 6.25kW

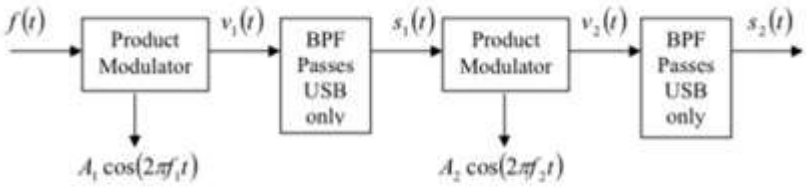
What will be the total side band power radiated at 75% modulation index. * 2 points

- ( ) 18.75kW
- (●) 14.06kW
- ( ) 68.75kW
- ( ) 6.25kW

Q3. The figure 3 shows a two stage SSB modulator. The input signal is voice signal occupying frequency range 0.3-3.4kHz. Oscillator frequencies are 20kHz and 500kHz respectively.

Upload the solution along with Descriptive question section answers

Figure 3



Specify the sidebands of all the modulated signals appearing in this system. $\{v_1(t),\ s_1(t),\ v_2(t),\ s_2(t)\}$.

Side bands of V1(t) * 2 points

- A) 20.3kHz -23.4kHz
- B) 16.6kHz-19.7kHz
- C) 23.4kHz and 20.3kHz
- Both A and B

Side bands of S1(t) * 1 point

- A) 20.3kHz -23.4kHz
- B) 16.6kHz-19.7kHz
- 23.4kHz
- Both A and B

Side bands of V2(t) * 2 points

- [ ] A) 476.6k-479.7kHz
- [ ] B)520.3k-523.4kHz
- [ ] C)479.7kHz,523.4kHz
- [x] Both A and B

Side bands of S2(t) * 1 point

- [ ] A) 476.6k-479.7kHz
- [x] B)520.3k-523.4kHz
- [ ] C)479.7kHz,523.4kHz
- [ ] 523.4kHz

Q4. Descriptive Answer Section

Read the question carefully and attempt. After attempting upload the scanned copy of the solution as PDF

Answer the following questions on a sheet of paper and upload the scanned copy. 30 points

Q No	Questions
4.1	Draw circuit diagram of Switching modulator. Write time domain description of output of the Modulator (5M)
4.2	Draw the circuit diagram and relevant wave forms of envelop detector. Specify the charging and discharging time constraints. (5M)
4.3	Draw circuit diagram of Ring modulator. Write the time domain description for ring modulator output. (5M)
4.4	Draw the block diagram of Costas Receiver. Specify the expression for output at I channel and Q channel. (5M)
4.5	Draw the block diagram of VSB modulator and Demodulator. Specify the constraints on Filter design. (5M)
4.6	Draw the block diagram of Transmitter and Receiver parts in a FDM system. (5M)

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