

**Q.2** a. What does modulation actually do to a message and carrier?

**Answer: Page Number 05 to 06 of Text Book**

b. Explain the thermal agitation noise.

**Answer: Page Number 17 to 18 of Text Book**

c. A receiver connected to an antenna whose resistance is 50 Ohms has an equivalent noise resistance of 30 Ohms. Calculate the receiver's noise figure in decibels and its equivalent noise temperature.

**Answer: Page Number 32 of Text Book**

**Q.3** a. The antenna current of an AM transmitter is 8A when only carrier is sent but it increases to 8.93A when the carrier is modulated by a single sine wave. Find the % modulation and antenna current when % modulation changes to 0.8. Derive the formula used.

**Answer: Page Number 41 of Text Book**

b. When the modulation percentage is 75, an AM transmitter produces 10 KW. How much of this is carrier power? What would be the percentage power saving if the carrier and one of the sidebands were suppressed before transmission took place.

**Answer:**

Solution is given below

$$\% \text{ of modulation } m = 75 = 0.75$$

$$\text{Transmitter power } P_t = 10 \text{ KW}$$

$$\text{Carrier Power } P_c = \frac{P_t}{1 + \frac{m^2}{2}}$$

$$P_c = \frac{10 \text{ KW}}{1 + \frac{0.75^2}{2}} = 7.8 \text{ KW}$$

$$\text{Power in two sidebands} = 10 \text{ KW} - 7.8 \text{ KW} = 2.2 \text{ KW}$$

$$\text{Power in one sideband} = 1.1 \text{ KW}$$

$$\text{Carrier power} + \text{Power in one sideband} = 7.2 \text{ KW} + 1.1 \text{ KW} = 8.3 \text{ KW}$$

$$\% \text{ of Power saving if carrier and one sideband is removed} =$$

$$\frac{10 \text{ KW} - 1.7 \text{ KW}}{10 \text{ KW}} \times 100 = 83\%$$

**Q.4** a. Compare amplitude modulation system and frequency modulation systems.

**Answer: Page Number 91 to 92 of Text Book**

b. Explain the Pre-emphasis and De-emphasis.

**Answer: Page Number 95 to 96 of Text Book**

**Q.5** a. Explain, with a neat block diagram, the working of a TRF AM radio receiver. Write its disadvantages.

**Answer: Page Number 119 to 120 of Text Book**

- b. Explain, with a neat block diagram, the working of FM Radio Receiver.

**Answer: Page Number 158 to 162 of Text Book**

- Q.6** a. Explain (i) Ungrounded Antennas and (ii) Grounded Antennas

**Answer: Page Number 270 of Text Book**

- b. Describe the various factors that decide what should be 'optimum length' of a grounded medium frequency antenna.

**Answer: Page Number 277 to 278 of Text Book**

- Q.7** a. Explain the phenomenon of Ground wave propagation.

**Answer: Page number 237 to 238 of Text Book**

- b. Explain the following terms:  
(i) Radio Horizon  
(ii) Troposphere scatter propagation  
(iii) Reflection and Refraction of wave

**Answer: Page Number 246-248, 229-230 of Text Book**

- Q.8** a. What is telegraphy? Describe briefly the system and machines used for transmitting & receiving it.

**Answer: Page Number 329 to 330 of Text Book**

- b. Explain waveguide couplings.

**Answer: Page Number 338 to 340 of Text Book**

- Q.9** Write short note any **TWO** of the following:

- (i) Pulse Code Modulation (P C M)  
(ii) Troposcatter link  
(iii) Satellite communication  
(iv) TDM

**Answer:**

**(i) Page Number 499 to 501 of Text Book**

**(ii) Page Number 564 to 566 of Text Book**

**(iii) Page Number 571 to 573 of Text Book**

### **Text Book**

Electronic Communication Systems, George Kennedy and Bernard Davis, Fourth Edition (1999), Tata McGraw Hill Publishing Company Ltd.