Q2 (a) What do you understand by amplitude modulation? Show that the AM output contains two sidebands and the carrier frequency.

Answer   Page Number 35, 36 and 37 of Textbook

Q2 (b) Show that the equivalent parallel impedance of a tuned circuit is its equivalent resistance for noise.

Answer   Page Number 24 of Textbook

Q3 (a) The antenna current of an AM broadcast transmitter, modulated to depth of 40% by an audio sine wave is 11 amp. It increases to 12 amp as a result of simultaneous modulation by another audio sine wave. What is the modulation index due to this second wave.

Answer
We know that
$I_t = I_c \, (1+ m^2/2)^{1/2}$

$I_c = I_t \, / \, (1+ m^2/2)^{1/2}$

$= 11/ \, (1+ (0.4)^2/2)^{1/2}$

$= 11/ \, (1+0.08)^{1/2}$

Ic = 10.58 Amp

Mt= total modulation index

$Mt = \{2[It/Ic]^2 - 1\}^{1/2}$
=0.757

$M^2 = M_t{}^2 - M_1{}^2$

$= (0.423)^{\frac{1}{2}}$

M= 0.643= MODULATION INDEX DUE TO SECOND WAVE

Q3 (b) Draw the block diagram of phase cancellation SSB generator and explain how the carrier and unwanted sideband are suppressed. What change is necessary to suppress the other sideband?

Answer   Page Number 64-65 of Textbook

Q4 (a) Explain Co-channel and Adjacent channel interference in radio receivers. Also compare wideband and narrow band FM.

Answer Page Number 97-98 of Textbook

Q4 (b) **Explain Armstrong frequency modulation system with block diagram.**

Answer Page Number 110-111 of Textbook

Q5 (a) **Define and explain the meaning of standing wave ratio. What is the formula for it, if the load is purely resistive? Why is a high value of SWR often undesirable?**

Answer Page Number 195 of Textbook

Q5 (b) **Explain how the constant intermediate frequency is achieved in the super heterodyne receiver and also explain the term sensitivity, selectivity and image frequency.**

Answer Page Number 121-126 of Textbook

Q6 (a) **Calculate the ratio of cross section of a circular waveguide to that of a rectangular one, if each is to have same cut off wavelength for its dominant mode.**

Answer Page Number 333 of Textbook

Q6 (b) **Compare waveguide and transmission line from the point of view of frequency limitation, attenuation, spurious radiation and power handling capacity.**

Answer Page Number 351 of Textbook

Q7 (a) **What are the typical frequencies, bandwidths and repeater gains and spacing's in a coaxial cable system?**

Answer Page Number 569 of Textbook

Q7 (b) **How do the three major types of INTELSAT satellite earth stations differ from each other, in general appearance and applications?**

Answer Page Number 568 of Textbook

Q8 (a) **What do you mean by PCM. Explain its transmitter and receiver with help of block diagram.**

Answer Page Number 500-502 of Textbook

Q8 (b)   **What is telegraphy? Describe briefly the system and machines used for transmitting and receiving it.**

Answer   Page Number 508 - 509 of Textbook

Q9   **Write short note on any <u>TWO</u>:**

     (i)   **Reactance Properties of transmission lines.**
     (ii)   **Detection and AGC.**
     (iii) **Noise Figure Measurement.**

Answer

   (i)   Page Number 199 of Textbook
   (ii)   Page Number 136 of Textbook
   (iii) Page Number 31-32 of Textbook

Text Book

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