PHYSICS

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

COMMUNICATION SYSTEM

Textual Examples

1. A transmitting antenna at the top of a tower has a height 32 m and the height of the

receiving antenna is 50 m . What is the maximum distance between them for satisfactory communication in LOS mode ? Given radius of earth 6.4×10^6m .

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2. A message signal of frequency 10 kHz and peak voltage of 10 volts is used to modulate a carrier of frequency 1 MHz and peak voltage of 20 volts . Determine (a) modulation index , (b) the side bands produced .

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Very Short Answer Questions

1. What are the basic blocks of a communication system ?

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2. What is "World Wide Web" (W W W) ?

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3. Mention the frequency range of speech signals .

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4. What is sky wave propagation ?

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5. Mention the various parts of the ionosphere ?

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6. Define Modulation. Why is it necessary ?

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7. Mention the basic methods of modulation .

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8. Which type of communication is employed in Mobile Phones ?

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Short Answer Questions

1. Draw the block diagram of a generalized communication system and explain it briefly

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2. What is Ground wave ? When is it used for communication ?

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3. What is sky wave propagation ?

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4. What is Space Wave Communication? Explain.

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5. What do you understand by modulation ? Explain the need for modulation .

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6. What should be the size of the antenna or aerial ? How the power radiated is related to length of the antenna and wavelength ?

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7. Explain amplitude modulation .

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8. How can an amplitude modulated wave be generated ?

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9. How can an amplitude modulated wave be detected ?

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Textual Exercises

1. Which of the following frequencies will be suitable for beyond the horizon communication using sky waves ?

A. 10 kHz

B. 10 MHz

C. 1 GHz

D. 1000 GHz

Answer:

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2. Frequencies in the UHF range normally propagate by means of

A. Ground waves

B. Sky waves

C. Surface waves

D. Space waves

Answer:

3. Digitals signals

(i) do not provide a continous set of values

(ii) represent values are discrete steps

(iii) can utilize binary system and

(iv) can utilize decimal as well as binary

systems .

Which of the above statements are true ?

A. (i) and (ii) only

B. (i) , (ii) and (iii) but not (iv)

C. (ii) and (iii) only

D. All of (i) , (ii) , (iii) and (iv) .

Answer:

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4. Is it necessary for a transmitting antenna to be at the same height as that of the receiving antenna for line-of-sight communication ? A TV transmitting antenna is 81 m tall . How much service area can it cover if the receiving antenna is at the ground level ?

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5. A carrier wave of peak voltage 12 V is used to transmit a message signal . What should be

the peak voltage of the modulating signal in order to have a modulation index of 75% ?

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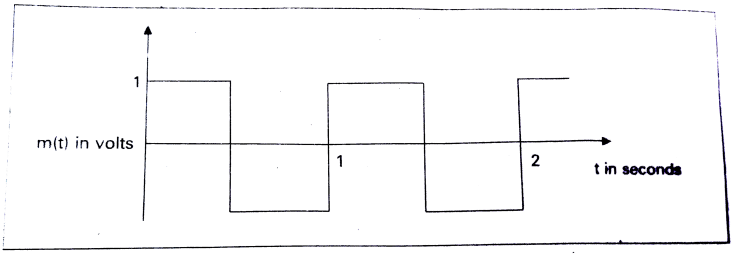
6. A modulating signal is a square wave , as shown in fig.

The carrier wave is given by c(t) = 2 sin $(8\pi t)$ volts .

(i) Sketch the amplitude modulated waveforms .

(ii) What is the modulation index ?



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7. For an amplitude modulated wave , the maximum amplitude is found to be 10 V while has minimum amplitude is found to ve 2 V . Determine the modulation index , μ.

What would be the value of m if the minimum amplitude is zero volt ?

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8. Due to economic reasons , only the upper sideband of an AM wave is transmitted , but at the receiving station , there is a facility for generating the carrier . Show that if a device is available which can multiply two signals , then it is possible to recover the modulating signal at the receiver station .

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