PHYSICS

BOOKS - PSEB

COMMUNICATIONS SYSTEMS

Exercise

1. Which of the following frequencies will be suitable for beyond-the-horizon communication using the 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:

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3. Digital signals (i) do not provide a continuous set of values, (ii) represent values as 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. (ii) and (iii) only

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

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

Answer:

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 81m 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 12V 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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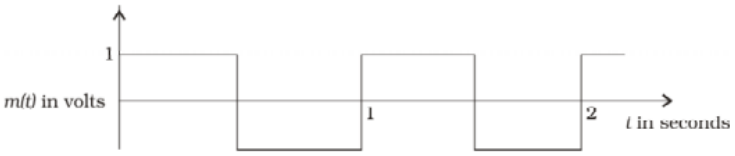
6. A modulating signal is a square wave, as shown in Fig. 15.14. The carrier wave is given by $c(t)=2\sin(8\pi t)$ volts. Sketch the amplitude modulated waveform



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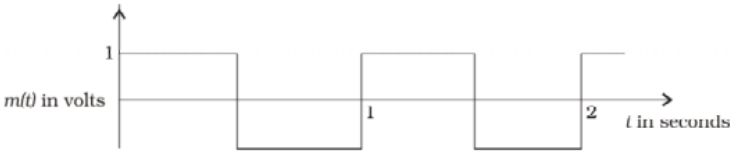
7. A modulating signal is a square wave, as shown in Fig. 15.14. The carrier wave is given by $c(t)=2\sin(8\pi t)$ volts. What is the modulation index? :



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8. For an amplitude modulated wave, the maximum amplitude is found to be10V while

the minimum amplitude is found to be 2V. Determine the modulation index, μ. What would be the value of μ if the minimum amplitude is zero volt?

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9. 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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