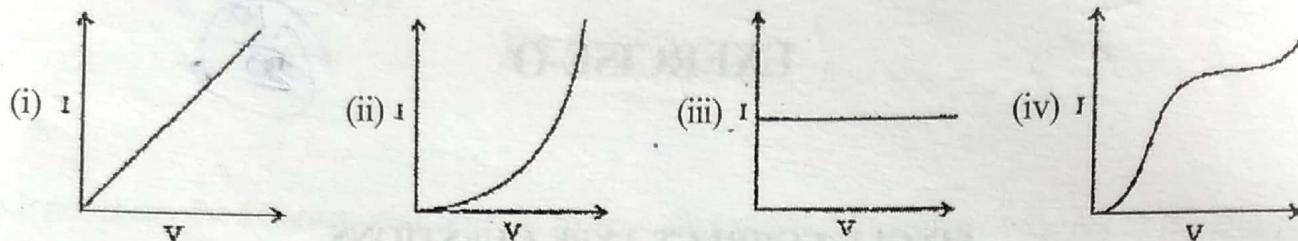


SINGLE CORRECT TYPE QUESTIONS

1. If a carrier wave of 1000 kHz is used to carry the signal, the length of transmitting antenna will be equal to :-
(A) 3 m (B) 30m (C) 300 m (D) 3000 m
2. The maximum range of ground or surface wave propagation depends on :-
(A) the frequency of the radio waves only (B) power of the transmitter only
(C) both of them (D) none of them
3. For television broadcasting, the frequency employed is normally :-
(A) 30-300MHz (B) 30-300 GHz (C) 30-300KHz (D) 30-300Hz-
4. The audio signal :-
(A) can be sent directly over the air for large distance
(B) cannot be sent directly over the air for large distance
(C) possess very high frequency
(D) none of the above
5. For a carrier frequency of 100 kHz and a modulating frequency of 5 kHz what is the width of AM transmission-
(A) 5 kHz (B) 10kHz (C) 20 kHz (D) 200 KHz = 2fm
6. Three waves A, B and C of frequencies 1600 kHz, 5 MHz and 60 MHz, respectively are to be transmitted from one place to another. Which of the following is the most appropriate mode of communication :
(A) A is transmitted via space wave while B and C are transmitted via sky wave.
(B) A is transmitted via ground wave, B via sky wave and C via space wave.
(C) B and C are transmitted via ground wave while A is transmitted via sky wave.
(D) B is transmitted via ground wave we while A and C are transmitted via space wave.
7. A speech signal of 3kHz is used to modulate a carrier signal of frequency 1 MHz, using amplitude modulation. The frequencies of the side bands will be = c - fm
(A) 1.003 MHz and 0.997 MHz. (B) 3001 kHz and 2997 kHz. 1 MHz = 3000 kHz
(C) 1003 kHz and 1000 kHz. (D) 1 MHz and 0.997 MHz.
8. A message signal of frequency ω_m is superposed on a carrier wave of frequency ω_c to get an amplitude mediated wave (AM) The frequency of the AM wave will be
(A) ω_m (B) ω_c (C) $\frac{\omega_c + \omega_m}{2}$ (D) $\frac{\omega_c - \omega_m}{2}$

SBG STUDY

9. I-V characteristics of four devices are shown in Fig.



Identify devices that can be used for modulation:

- (A) 'i' and 'iii' (B) only 'iii'
 (C) 'ii' and some regions of 'iv' (D) All the devices can be used

10. A basic communication system consists of

- (A) transmitter (B) information source. (C) user of information.
 (D) channel (E) receiver.

Choose the correct sequence in which these are arranged in a basic communication system :-

- (A) ABCDE (B) BADEC (C) BDACE (D) BEADC

11. Identify the mathematical expression for amplitude modulated wave :

- (A) $A_c \sin [\{\omega_c + k_1 v_m(t)t\} + \phi]$ (B) $A_c \sin \{\omega_c t + \phi + k_2 v_m(t)\}$
 (C) $\{A_c + k_2 v_m(t)\} \sin (\omega_c t + \phi)$ (D) $A_c + v_m(t) \sin (\omega_c t + \phi)$

12. **Statement 1 :** Skywave can not be observed on moon.

Statement 2 : Atmosphere of variable refractive index is require for propagation of skywave.

- (A) Both Statement-1 and Statement-2 are true, and Statement-2 is the correct explanation of Statement-1
 (B) Both Statement-1 and Statement-2 are true but Statement-2 is not the correct explanation of Statement-1.
 (C) Statement-1 is true but Statement-2 is false.
 (D) Statement-1 is false but Statement-2 is true.

13. **Statement 1 :** Ground wave communication is effective only allow frequencies in the range 500kHz to about 1500 kHz.

Statement 2 : The decrease in the intensity of the signal due to absorption by the earth and its atmosphere is higher for higher frequencies.

- (A) Both Statement-1 and Statement-2 are true, and Statement-2 is the correct explanation of Statement-1.
 (B) Both Statement-1 and Statement-2 are true but Statement-2 is not the correct explanation of Statement-1.
 (C) Statement-1 is true but Statement-2 is false.
 (D) Statement-1 is false but Statement-2 is true.

14. **Statement 1 :** The refractive index of the ionosphere increases as we go from the lower to upper layers in the ionosphere.

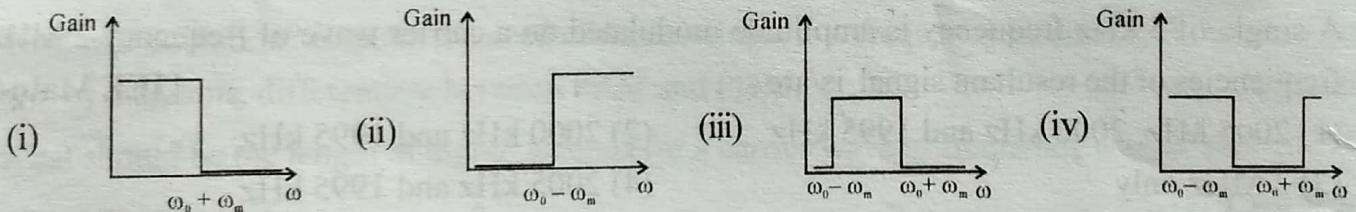
Statement 2 : The degree of ionization is higher at the upper layers than at the lower layers of the ionosphere.

- (A) Both Statement-1 and Statement-2 are true, and Statement-2 is the correct explanation of Statement-1.
 (B) Both Statement-1 and Statement-2 are true but Statement-2 is not the correct explanation of Statement-1.
 (C) Statement-1 is true but Statement-2 is false.
 (D) Statement-1 is false but Statement-2 is true.

15. **Statement 1** : Sky wave communication is not suitable for frequencies greater than 30 MHz.
Statement 2 : High frequency signals die out before reaching the ionosphere.
- (A) Both Statement-1 and Statement-2 are true, and Statement-2 is the correct explanation of Statement-1 .
 (B) Both Statement-1 and Statement-2 are true but Statement-2 is not the correct explanation of Statement-1.
 (C) Statement-1 is true but Statement-2 is false.
 (D) Statement-1 is false but Statement-2 is true.

MULTIPLE CORRECT TYPE QUESTIONS

16. An audio signal of 15 kHz frequency cannot be transmitted over long distances without modulation because
 (A) the size of the required antenna would be at least 5 km which is not convenient.
 (B) the audio signal cannot be transmitted through skywaves.
 (C) the size of the required antenna would be at least 20 km, which is not convenient.
 (D) effective power transmitted would be very low, if the size of the antenna is less than 5 km.
17. Audio sine waves of 3 kHz frequency are used to amplitude modulate a carrier signal of 1.5 MHz. Which of the following statements are true?
 (A) The side band frequencies are 1506 kHz and 1494 kHz.
 (B) The bandwidth required for amplitude modulation is 6 kHz.
 (C) The bandwidth required for amplitude modulation is 3 MHz.
 (D) The side band frequencies are 1503 kHz and 1497 kHz.
18. The frequency response curve (Fig.) for the filter circuit used for production of AM waves should be



- (A) (i) followed by (ii)
 (B) (ii) followed by (i)
 (C) (iii)
 (D) (iv)
19. In amplitude modulation, the modulation index m , is kept less than or equal to 1 because
 (A) $m > 1$, will result in interference between carrier frequency and message frequency, resulting into distortion.
 (B) $m > 1$ will result in overlapping of both side bands resulting into loss of information.
 (C) $m > 1$ will result in change in phase between carrier signal and message signal.
 (D) $m > 1$ indicates amplitude of message signal greater than amplitude of carrier signal resulting into distortion.
20. An audio signal is modulated by a carrier wave of 20 MHz such that the bandwidth required for modulation is 3 kHz. Could this wave be demodulated by a diode detector which has the values of R and C as :-
 (A) $R = 1 \text{ k}\Omega$, $C = 0.01 \text{ }\mu\text{F}$
 (B) $R = 10 \text{ k}\Omega$, $C = 0.01 \text{ }\mu\text{F}$
 (C) $R = 10 \text{ k}\Omega$, $C = 0.1 \text{ }\mu\text{F}$
 (D) None of these