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PHYSICS · EAPCET (EAMCET)

Communication Systems

Previous Year Questions with answers

133 questions · **133** papers · **2012–2026** · newest paper first

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What is in this PDF: every Communication Systems question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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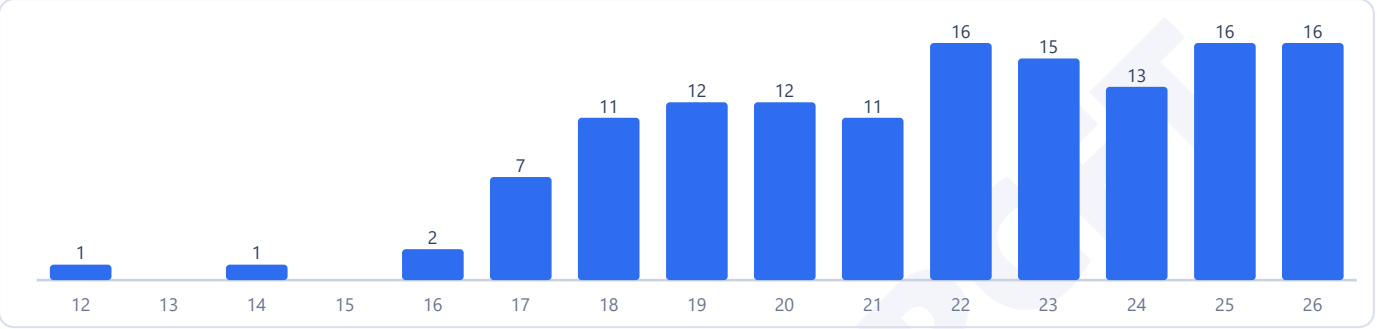
Chapter at a glance

2.5%	133	76 of 77	133 / 0
of Physics questions, 2022–2026	questions, 2012–2026	papers asked it, 2022–2026	MCQ / numerical, 2012–2026

Trend. Steady: 1 questions per paper in 2024–2026 against 1 in 2022–2023.

Questions per year



Counts are the questions we hold: 133 in 133 papers. 4 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2012–2026)

Modulation	67
Communication Basics	66

How often it comes up

Communication Systems provides a concise applied chapter that concludes the Class 12 physics curriculum. In the papers we hold for AP and TS EAPCET between 2022 and 2026, this chapter accounted for 76 questions across 77 papers. That gives an average frequency of 1.0 question per paper, making up 2.5% of all physics questions in that recent window. Taking the full historical record from 2010 to 2026 into account, Communication Systems contributed 133 questions across 149 papers, maintaining an average of 0.9 questions per paper and a 2.2% subject share. For early years between 2010 and 2021, our records capture 57 questions across 72 papers (2.0% share). Over the last three exam years from 2024 to 2026, it provided 45 questions across 46 papers, registering a 2.4% share. Compared with the early period, the subject share in the last three years is about the same, and when set against the recent five-year window it is likewise about the same.

State-level distributions indicate equal representation across both regional entrance boards. AP EAPCET papers between 2022 and 2026 contributed 47 questions across 48 papers in our set, with 47 papers containing questions (1.0 per paper, 2.4% share). TS EAPCET contributed 29 questions across 29 papers in our set, with all 29 papers featuring questions (1.0 per paper, 2.5% share). Communication Systems has appeared every year since 2022, though across all 77 recent papers in our collection, one AP sitting omitted it, meaning it did not feature in all 77 sittings. By question volume between 2022 and 2026, it occupies the 24th rank among the 28 physics chapters. Sittings in 2022, 2025, and 2026 tied as the busiest years in our archive, each supplying 16 questions across 16 papers.

Most-asked topics

Questions distribute across two balanced syllabus areas:

- **Modulation**: This leading division brought 40 questions between 2022 and 2026, contributing to 67 questions across all years in our archive. It tests amplitude modulation index μ = A_m / A_c, maximum and minimum envelope voltages, sideband frequencies (f_c ± f_m), transmission bandwidth two f_m, and power relationships in AM waves.

- **Communication Basics**: This part brought 36 questions across the recent five years and 66 questions across our entire archive. Key concepts cover transmitter and receiver blocks, ground wave, sky wave, and space wave propagation, critical frequency, skip distance, line-of-sight transmission distance d = √(two R h_t) + √(two R h_r), and antenna length criteria.

What the questions look like

Amplitude modulation calculations represent the core problem type in this chapter. A classic question provides the maximum envelope amplitude A_max and minimum envelope amplitude A_min of an AM signal on an oscilloscope screen and asks for the modulation index μ = (A_max - A_min) / (A_max + A_min). Another frequent variant tests undistorted transmission criteria, requiring students to identify that the modulation index must remain less than or equal to unity (μ ≤ 1) to prevent envelope distortion and overmodulation.

Wave propagation and antenna problems form the other recurring group. Students are frequently asked for the maximum line-of-sight range between a transmitting antenna of height h_t and a receiving antenna of height h_r on the spherical Earth. Another standard problem evaluates how the radiated power of a linear antenna scales with wavelength, relying on the inverse square law where radiated power $P \propto (l / \lambda)^2$. Sky wave propagation questions test ionospheric reflection mechanisms, such as identifying the critical frequency or determining which ionospheric layer reflects night-time high-frequency waves.

How to practise it

Start by mastering amplitude modulation formulas. An amplitude modulated wave consists of a carrier component and two sidebands: upper sideband at frequency f_c + f_m and lower sideband at f_c - f_m. The required transmission bandwidth is two f_m. Total power in an AM wave is P_total = P_carrier [1 + μ^2 / two]. When modulation index reaches its maximum distortionless value μ = 1, sideband power accounts for exactly one third of total transmitted power, with the remaining two thirds carried by the unmodulated carrier.

Next, study electromagnetic wave propagation modes. Ground waves attenuate rapidly through surface absorption, limiting their utility to frequencies below two megahertz. Sky waves reflect from the ionosphere via total internal refraction for frequencies below the critical frequency f_c = nine √(N_max). Space waves operate above forty megahertz in line-of-sight configurations: the radio horizon distance for a tower of height h is d = √(two R h), where R is the radius of the Earth, and maximum line-of-sight range between towers is d_max = √(two R h_t) + √(two R h_r).

Finally, review antenna specifications. For effective radiation of an electromagnetic signal, the physical antenna dimension should be comparable to wavelength, with the minimum length of a linear dipole antenna given by λ / four.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

If the wavelength of signal to be transmitted by an antenna is increased by 2 times, then the effective power radiated by antenna

(A) Becomes $\frac{1}{4}$ times of the initial value
(B) Increases by 4 times of initial value
(C) Remains same
(D) Becomes $\frac{1}{2}$ times of the initial value

Answer: (A) Becomes $\frac{1}{4}$ times of the initial value · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 2 MCQ

A TV transmitting antenna is 81 m tall. Service area covered, if the receiving antenna is at the ground level, will be about

(A) $2500\ \text{km}^2$
(B) $3250\ \text{km}^2$
(C) $4250\ \text{km}^2$
(D) $1525\ \text{km}^2$

Answer: (B) $3250\ \text{km}^2$ · The council's preliminary key

Q3 AP EAPCET 2026 · 15 May · Shift 1 MCQ

An audio signal $10 \sin 2\pi(1500)t$ volt amplitude modulates a carrier $40 \sin 2\pi(10^5)t$ volts. The modulation factor and percentage modulation are

(A) 0.25, 25%
(B) 0.40, 40%
(C) 0.10, 10%
(D) 0.50, 50%

Answer: (A) 0.25, 25% · The council's preliminary key

Q4 AP EAPCET 2026 · 15 May · Shift 2 MCQ

Video signals for the transmission of pictures require a frequency bandwidth of

(A) 20.6 Hz
(B) 20.5 kHz
(C) 6.8 GHz
(D) 4.2 MHz

Answer: (D) 4.2 MHz · The council's preliminary key

Q5 AP EAPCET 2026 · 14 May · Shift 1 MCQ

A carrier wave of frequency $2\ MHz$ and peak voltage $15\ V$ is used to modulate a message signal of frequency $20\ kHz$ and peak voltage $8\ V$. The frequencies of side bands produced are

(A) $2000\ kHz, 20\ kHz$
(B) $2020\ kHz, 1980\ kHz$
(C) $2040\ kHz, 1960\ kHz$
(D) $2020\ kHz, 2000\ kHz$

Answer: (B) $2020\ kHz, 1980\ kHz$ · The council's preliminary key

Q6 AP EAPCET 2026 · 14 May · Shift 2 MCQ

In amplitude modulation, if the modulation index is 0.8 and the peak voltage of the message signal is 10 V, then the amplitudes of the upper and lower side bands of the modulated wave are respectively

(A) 22.5V, 2.5V
(B) 12.5V, 10V
(C) 5V,5V
(D) 10V, 5V

Answer: (C) 5V,5V · The council's preliminary key

Q7 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If f_m is a modulating frequency and f_c is carrier wave frequency, then Bandwidth in Amplitude Modulated wave is

(A) $2f_c$
(B) $f_c + f_m$
(C) $2f_m$
(D) $\frac{(f_c+f_m)}{2}$

Answer: (C) $2f_m$ · The council's preliminary key

Q8 AP EAPCET 2026 · 13 May · Shift 2 MCQ

A carrier wave of peak voltage $12\ V$ is used to transit a message signal. If the modulation index is $75\ \%$, then the peak voltage of the modulating signal is

(A) $16\ V$
(B) $9\ V$
(C) $6\ V$
(D) $8\ V$

Answer: (B) $9\ V$ · The council's preliminary key

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Q9 AP EAPCET 2026 · 12 May · Shift 1 MCQ

To have non distorted signal, modulation index (μ) should be

(A) ≥ 1
(B) $= 1$
(C) ≤ 1
(D) > 2

Answer: (C) ≤ 1 · The council's preliminary key

Q10 AP EAPCET 2026 · 12 May · Shift 2 MCQ

For an amplitude modulated wave, maximum and minimum amplitudes are found to be 12 V and 4 V. modulation index is

(A) 50 %
(B) 25 %
(C) 75 %
(D) 60 %

Answer: (A) 50 % · The council's preliminary key

Q11 TS EAPCET 2026 · 11 May · Shift 1 MCQ

The approximate bandwidth of frequency required to transmit music is

(A) 20 kHz
(B) 2800 Hz
(C) 4.2 MHz
(D) 100 MHz

Answer: (A) 20 kHz · The council's preliminary key

Q12 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If the peak voltage of message signal is 60% less than the peak voltage of the carrier wave, then the modulation index is

(A) 0.3
(B) 0.4
(C) 0.6
(D) 0.2

Answer: (B) 0.4 · The council's preliminary key

Q13 TS EAPCET 2026 · 10 May · Shift 1 MCQ

In amplitude modulation, if the amplitude of the message signal is increased by 20% and the amplitude of the carrier wave is decreased by 20%, then the percentage increase in the modulation index is

(A) 75
(B) 40
(C) 25
(D) 50

Answer: (D) 50 · The council's preliminary key

Q14 TS EAPCET 2026 · 10 May · Shift 2 MCQ

For an amplitude modulated wave, if the maximum amplitude is 400% more than its minimum amplitude, then the modulation index is

(A) $\frac{3}{4}$
(B) $\frac{1}{4}$
(C) $\frac{2}{3}$
(D) $\frac{1}{2}$

Answer: (C) $\frac{2}{3}$ · The council's preliminary key

Q15 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The layer of the atmosphere that efficiently reflects high frequency waves particularly at night is

(A) Mesosphere
(B) Troposphere
(C) Stratosphere
(D) Thermosphere

Answer: (D) Thermosphere · The council's preliminary key

Q16 TS EAPCET 2026 · 9 May · Shift 2 MCQ

If the length of a linear antenna is increased by 60% and the wavelength of the signal is decreased by 20%, then the percentage increase in the effective power radiated by the antenna is

(A) 50
(B) 250
(C) 300
(D) 150

Answer: (C) 300 · The council's preliminary key

Q17 AP EAPCET 2025 · 27 May · Shift 1 MCQ

In amplutide modulation, if a message signal of 5 kHz is modulated by a carrier wave of frequency 900 kHz, then the frequencies of the side bands are

(A) 905 kHz, 895 kHz
(B) 900 kHz, 800 kHz
(C) 800 kHz, 700 kHz
(D) 1000 kHz, 900 kHz

Answer: (A) 905 kHz, 895 kHz · The council's preliminary key

Q18 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The heights of tansmitting and receiving antennas are respectively $\frac{1}{20000}$ and $\frac{1}{80000}$ times the radius of the earth. The maximum distance between these two antennas for satisfactory communication in line of sight mode is
(Radius of the earth $= 6.4 \times 10^6$ m)

(A) 48 km
(B) 96 km
(C) 320 km
(D) 192 km

Answer: (B) 96 km · The council's preliminary key

Q19 AP EAPCET 2025 · 26 May · Shift 2 MCQ

The layer of the atmosphere that reflects low frequency (LF) electromagnetic waves during day time only is

(A) D
(B) E
(C) F_1
(D) F_2

Answer: (A) D · The council's preliminary key

Q20 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If the ratio of the maximum and minimum amplitudes of an amplitude modulated wave is $7:3$, then the modulation index is

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(A) 0.6
(B) 0.7
(C) 0.4
(D) 0.3

Answer: (C) 0.4 · The council's preliminary key

Q21 AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the maximum and minimum amplitudes of a modulated wave are 25 V and 5 V respectively, then the modulation index is

(A) $\frac{1}{5}$
(B) $\frac{1}{3}$
(C) $\frac{3}{2}$
(D) $\frac{2}{3}$

Answer: (D) $\frac{2}{3}$ · The council's preliminary key

Q22 AP EAPCET 2025 · 23 May · Shift 2 MCQ

Ionosphere acts as a reflector for the frequency range of

(A) 3 – 30 kHz
(B) 3 – 30 MHz
(C) 3 – 30 Hz
(D) 3 – 30 GHz

Answer: (B) 3 – 30 MHz · The council's preliminary key

Q23 AP EAPCET 2025 · 22 May · Shift 1 MCQ

If in an amplitude modulated wave, the maximum amplitude is 14 V and the modulation index is 0.4, then the amplitude of the carrier wave is

(A) 4 V
(B) 8 V
(C) 12 V
(D) 10 V

Answer: (D) 10 V · The council's preliminary key

Q24 AP EAPCET 2025 · 22 May · Shift 2 MCQ

For transmitting a signal of frequency 1000 kHz, the minimum length of the antenna is

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(A) 30 m
(B) 50 m
(C) 75 m
(D) 1500 m

Answer: (C) 75 m · The council's preliminary key

Q25 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If the sum of heights of transmitting and receiving antennas in line of sight of communication is 'h', then the height of receiving antenna, to have the range maximum is

(A) $\frac{h}{2}$
(B) $\frac{h}{4}$
(C) $2h$
(D) $\frac{2h}{3}$

Answer: (A) $\frac{h}{2}$ · The council's preliminary key

Q26 AP EAPCET 2025 · 21 May · Shift 2 MCQ

In amplitude modulation of waves, the maximum amplitude is 30 mV and minimum amplitude is 5 mV, then the modulation index is

(A) $\frac{4}{7}$
(B) $\frac{3}{7}$
(C) $\frac{5}{7}$
(D) $\frac{2}{7}$

Answer: (C) $\frac{5}{7}$ · The council's preliminary key

Q27 TS EAPCET 2025 · 4 May · Shift 1 MCQ

The radio horizon of a transmitting antenna of height 39.2 m is

(Radius of the earth = 6400 km)

(A) 44.8 km
(B) 19.6 km
(C) 22.4 km
(D) 78.4 km

Answer: (C) 22.4 km · The council's preliminary key

Q28 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If the frequencies of the carrier wave and message signal are 1 MHz and 28 kHz respectively, then the frequencies of the side bands are

(A) 1014 kHz, 986 kHz
(B) 1028 kHz, 972 kHz
(C) 29 kHz, 27 kHz
(D) 514 kHz, 486 kHz

Answer: (B) 1028 kHz, 972 kHz · The council's preliminary key

Q29 TS EAPCET 2025 · 3 May · Shift 1 MCQ

When the receiving antenna is on the ground, the range of a transmitting antenna of height 980 m is (Radius of the earth = 6400 km)

(A) 56 km
(B) 112 km
(C) 72.4 km
(D) 224 km

Answer: (B) 112 km · The council's preliminary key

Q30 TS EAPCET 2025 · 3 May · Shift 2 MCQ

The layer of the atmosphere which efficiently reflects high frequency waves particularly at night is

(A) Troposphere
(B) Stratosphere
(C) Mesosphere
(D) Thermosphere

Answer: (D) Thermosphere · The council's preliminary key

Q31 TS EAPCET 2025 · 2 May · Shift 1 MCQ

For commercial telephonic communication, the frequency range adequate for speech signals is

(A) 20 Hz - 20 kHz
(B) 300 Hz - 3100 Hz
(C) 200 MHz - 600 MHz
(D) 300 kHz - 8000 kHz

Answer: (B) 300 Hz - 3100 Hz · The council's preliminary key

Q32 TS EAPCET 2025 · 2 May · Shift 2 MCQ

Coaxial cable, a widely used wire medium offers an approximate frequency bandwidth of

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(A) 750 GHz
(B) 750 Hz
(C) 750 MHz
(D) 750 kHz

Answer: (C) 750 MHz · The council's preliminary key

Q33 AP EAPCET 2024 · 23 May · Shift 1 MCQ

Size of the antenna for a carrier wave of frequency 3 MHz is

(A) 75 m
(B) 50 m
(C) 2.5 m
(D) 25 m

Answer: (D) 25 m · The council's preliminary key

Q34 AP EAPCET 2024 · 22 May · Shift 1 MCQ

The maximum distance between the transmitting and receiving antennas for satisfactory communication in line of sight mode is 57.6 km. If the height of the receiving antenna is 80 m, the height of the transmitting antenna is (Radius of earth = 6.4×10^6 m)

(A) 28.8 m
(B) 51.2 m
(C) 25.6 m
(D) 14.4 m

Answer: (B) 51.2 m · The council's preliminary key

Q35 AP EAPCET 2024 · 22 May · Shift 2 MCQ

Which one of the following is not classified as pulse modulation

(A) Pulse duration modulation
(B) Pulse Amplitude Modulation
(C) Pulse band Modulation
(D) Pulse position Modulation

Answer: (C) Pulse band Modulation · The council's preliminary key

Q36 AP EAPCET 2024 · 21 May · Shift 1 MCQ

An information signal of frequency $10\ \mathrm{kHz}$ is modulated with a carrier wave of frequency $3.61\ \mathrm{MHz}$. The upper side and lower side frequencies are:

(A) $3650\ \text{kHz}$ and $3590\ \text{kHz}$
(B) $3620\ \text{kHz}$ and $3600\ \text{kHz}$
(C) $3610\ \text{kHz}$ and $3580\ \text{kHz}$
(D) $3600\ \text{kHz}$ and $3620\ \text{kHz}$

Answer: (B) $3620\ \text{kHz}$ and $3600\ \text{kHz}$ · The council's preliminary key

Q37 AP EAPCET 2024 · 20 May · Shift 1 MCQ

A carrier is simultaneously modulated by two sine waves with modulation indices of 0.3 and 0.4; then the total modulation index is

(A) 1
(B) 0.12
(C) 0.5
(D) 0.7

Answer: (C) 0.5 · The council's preliminary key

Q38 AP EAPCET 2024 · 20 May · Shift 2 MCQ

In amplitude modulation, the amplitude of the carrier wave is $10\ \text{V}$ and the amplitude of one of the side bands is $2\ \text{V}$. Then the modulation index is

(A) 0.4
(B) 0.6
(C) 0.7
(D) 0.5

Answer: (A) 0.4 · The council's preliminary key

Q39 AP EAPCET 2024 · 19 May · Shift 2 MCQ

A message signal of 3 kHz is used to modulate a carrier signal frequency 1 MHz, using amplitude modulation. The upper side band frequency and band width respectively are

(A) 1.003 MHz and 6KHz
(B) 0.997 MHz and 6KHz
(C) 1.003 MHz and 3KHz
(D) 1.003 MHz and 2MHz

Answer: (A) 1.003 MHz and 6KHz · The council's preliminary key

Q40 AP EAPCET 2024 · 18 May · Shift 1 MCQ

If the maximum and minimum voltages of an A.M wave are $V_{\max}$ and $V_{\min}$ respectively. Then the modulation factor 'm' is

(A) $(V_{\max}+V_{\min})/(V_{\max}\cdot V_{\min})$
(B) $(V_{\max}-V_{\min})/(V_{\max}+V_{\min})$
(C) $2V_{\max}V_{\min}/(V_{\max}+V_{\min})$
(D) $(V_{\max}+V_{\min})/(V_{\max}-V_{\min})$

Answer: (B) $(V_{\max}-V_{\min})/(V_{\max}+V_{\min})$ · The council's preliminary key

Q41 TS EAPCET 2024 · 11 May · Shift 1 MCQ

The maximum distance between the transmitting and receiving antennas is D. If the heights of both transmitting and receiving antennas are doubled, then the maximum distance between the two antennas is

(A) $2D$
(B) $D\sqrt{2}$
(C) $4D$
(D) $\frac{D}{\sqrt{2}}$

Answer: (B) $D\sqrt{2}$ · The council's preliminary key

Q42 TS EAPCET 2024 · 10 May · Shift 1 MCQ

The process of the loss of strength of a signal while propagating through a medium is

(A) damping
(B) attenuation
(C) amplification
(D) modulation

Answer: (B) attenuation · The council's preliminary key

Q43 TS EAPCET 2024 · 10 May · Shift 2 MCQ

For an amplitude modulated wave, the maximum and minimum amplitudes are found to be 10 V and 2 V respectively. Then the modulation index is

(A) $\frac{1}{3}$
(B) $\frac{3}{4}$
(C) $\frac{1}{5}$
(D) $\frac{2}{3}$

Answer: (D) $\frac{2}{3}$ · The council's preliminary key

Q44 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The heights of the transmitting and receiving antennas are 33.8 m and 64.8 m respectively. The maximum distance between the antennas for satisfactory communication in line of sight mode is (Radius of the earth = 6400 km)

(A) 20.8 km
(B) 28.8 km
(C) 49.6 km
(D) 57.6 km

Answer: (C) 49.6 km · The council's preliminary key

Q45 TS EAPCET 2024 · 9 May · Shift 2 MCQ

A message signal of peak voltage 12 V is used to amplitude modulate a carrier signal of frequency 1.2 MHz. The amplitude of the side bands is

(A) 12 V
(B) 3 V
(C) 6 V
(D) 8 V

Answer: (C) 6 V · The council's preliminary key

Q46 AP EAPCET 2023 · 19 May · Shift 1 MCQ

A message signal of frequency 14 kHz is used to modulate a carrier of frequency 900 kHz, then the frequencies of side bands are

(A) 907 kHz, 893 kHz
(B) 920 kHz, 880 kHz
(C) 914 kHz, 886 kHz
(D) 900 kHz, 914 kHz

Answer: (C) 914 kHz, 886 kHz · The council's preliminary key

Q47 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Digital signal

(A) is represented by a sine wave
(B) utilizes binary code system
(C) is represented by a cosine wave
(D) utilizes a hexadecimal code

Answer: (B) utilizes binary code system · The council's preliminary key

Q48 AP EAPCET 2023 · 18 May · Shift 2 MCQ

For an amplitude modulated wave, the maximum and minimum amplitudes are 12 V and 3 V respectively. Then the modulation index is

(A) 0.4
(B) 0.9
(C) 0.6
(D) 0.3

Answer: (C) 0.6 · The council's preliminary key

Q49 AP EAPCET 2023 · 17 May · Shift 1 MCQ

The radio horizon of the transmission of an antenna placed on 20th floor in a shopping mall, where the height of each floor is 2 m is

(Radius of earth is 6.4×10^6 m)

(A) 22.6 km
(B) 45 km
(C) 36 km
(D) 67.5 km

Answer: (A) 22.6 km · The council's preliminary key

Q50 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The refractive index of ionosphere is

(A) zero
(B) more than one
(C) less than one
(D) 1 (one)

Answer: (C) less than one · The council's preliminary key

Q51 AP EAPCET 2023 · 16 May · Shift 1 MCQ

An amplitude modulated wave is represented by $10\left[1+0.6\sin(40\times10^3t)\right]\sin(4\times10^6t)$ volt where t is in seconds. Then the ratio of the upper to the lower side band frequencies is

(A) $101:99$
(B) $100:99$
(C) $100:1$
(D) $10:1$

Answer: (A) $101:99$ · The council's preliminary key

Q52 AP EAPCET 2023 · 16 May · Shift 2 MCQ

The process of retrieval of information from the carrier wave

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(A) Amplification
(B) Attenuation
(C) Modulation
(D) Demodulation

Answer: (D) Demodulation · The council's preliminary key

Q53 AP EAPCET 2023 · 15 May · Shift 1 MCQ

A carrier wave of peak voltage $15\ \text{V}$ is used to transmit a message signal. If the modulation index is 60%, then the peak voltage of the modulating signal is

(A) $3\ \text{V}$
(B) $6\ \text{V}$
(C) $9\ \text{V}$
(D) $12\ \text{V}$

Answer: (C) $9\ \text{V}$ · The council's preliminary key

Q54 AP EAPCET 2023 · 15 May · Shift 2 MCQ

Band width of an optical fiber is

(A) more than 100 GHz
(B) less than 1 MHz
(C) less than 1 GHz
(D) less than 100 kHz

Answer: (A) more than 100 GHz · The council's preliminary key

Q55 TS EAMCET 2023 · 14 May · Shift 1 MCQ

An amplitude modulated wave is represented by $c_m(t) = 10[1 + 0.6\sin(1250t)]\sin(10^8 t)$. Then the modulation index is

(A) 10
(B) 1250
(C) 10^8
(D) 0.6

Answer: (D) 0.6 · The council's preliminary key

Q56 TS EAMCET 2023 · 14 May · Shift 2 MCQ

Consider the following statements regarding digital signals.

i) provide a continuous set of values

ii) represent values as discrete steps

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iii) can utilise binary system

iv) are in the form of rectangular waves

Then the true statements are

(A) (i), (ii)
(B) (ii), (iii)
(C) (ii), (iii), (iv)
(D) (i), (ii), (iii), (iv)

Answer: (C) (ii), (iii), (iv) · The council's preliminary key

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Q57 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The loss of strength of a signal while propagating through a medium is known as

(A) Modulation
(B) Demodulation
(C) Attenuation
(D) Noise

Answer: (C) Attenuation · The council's preliminary key

Q58 TS EAMCET 2023 · 13 May · Shift 2 MCQ

A telephonic communication service is working at a carrier frequency of 20 GHz. Only 20% of it is utilized for transmission. If each channel requires a bandwidth of 5 kHz, then the number of telephonic channels that can be transmitted simultaneously are

(A) 6×10^5
(B) 2×10^5
(C) 8×10^5
(D) 4×10^5

Answer: (C) 8×10^5 · The council's preliminary key

Q59 TS EAMCET 2023 · 12 May · Shift 1 MCQ

A message signal of frequency 10 kHz is used to modulate a carrier wave of frequency 6 MHz, then the side band frequencies are

(A) 6090 kHz, 610 kHz
(B) 5990 kHz, 6010 kHz
(C) 6000 Hz, 1000 Hz
(D) 6000 kHz, 6100 kHz

Answer: (B) 5990 kHz, 6010 kHz · The council's preliminary key

Q60 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The need for modulation is

(A) to increase the intensity of audio signal
(B) to decrease the intensity of audio signal
(C) to transmit audio signal to large distances
(D) to increase the frequency of audio signal

Answer: (C) to transmit audio signal to large distances · The council's preliminary key

Q61 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

A carrier wave of peak voltage 10 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 80%

(A) 8 V
(B) 8.8 V
(C) 5 V
(D) 12.5 V

Answer: (A) 8 V · The council's preliminary key

Q62 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

For an amplitude modulated wave, the modulation index is found to be 0.5. If the maximum amplitude is found to be 10.0 V, then the minimum amplitude is

(A) 5.0 V
(B) 3.33 V
(C) 2.5 V
(D) 6.66 V

Answer: (B) 3.33 V · The council's preliminary key

Q63 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

The range of frequency bands used for standard AM broadcast is

(A) $540 - 1600$ KHz
(B) $88 - 108$ MHz
(C) $800 - 900$ MHz
(D) $3.7 - 4.2$ GHz

Answer: (A) $540 - 1600$ KHz · The council's preliminary key

Q64 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Which of the following statements is NOT true?

(A) Power radiated from a linear antenna is directly proportional to square of antenna length
(B) Power radiated decreases with increasing frequency
(C) Antenna should have size comparable to the wavelength of the signal
(D) Effective power radiated by a long wavelength baseband signal is small

Answer: (B) Power radiated decreases with increasing frequency · The council's preliminary key

Q65 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

A TV transmission antenna is 40 m tall. How much service area it can cover if the receiving antenna is at the ground level?
(radius of the Earth = 6400 km)

(A) $640\pi \times 10^6\ \mathrm{m}^2$
(B) $512\pi \times 10^6\ \mathrm{m}^2$
(C) $480\pi \times 10^6\ \mathrm{m}^2$
(D) $440\pi \times 10^6\ \mathrm{m}^2$

Answer: (B) $512\pi \times 10^6\ \mathrm{m}^2$ · The council's preliminary key

Q66 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A message signal of frequency 15 kHz is used to modulate a carrier of frequency v_c. If the side bands produced are 1515 kHz and 1485 kHz, then v_c is

(A) 2.0 MHz
(B) 1.5 MHz
(C) 2.5 MHz
(D) 3.0 MHz

Answer: (B) 1.5 MHz · The council's preliminary key

Q67 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The amplitude of the side bands of the modulated signal if the carrier signal and message signal amplitudes are 25 V and 5 V respectively is

(A) $0.5\ \mathrm{V}$
(B) $2.5\ \mathrm{V}$
(C) $0.2\ \mathrm{V}$
(D) $5\ \mathrm{V}$

Answer: (B) $2.5\ \mathrm{V}$ · The council's preliminary key

Q68 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

A carrier wave of peak voltage 60 V is used to transmit a message signal. Then the peak voltage of the modulating signal in order to have a modulation index of 90% is

(A) 30 V
(B) 54 V
(C) 45 V
(D) 60 V

Answer: (B) 54 V · The council's preliminary key

Q69 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

The frequency band for uplink satellite communication in the following is

(A) $5.9 - 6.4$ GHz
(B) $54 - 72$ MHz
(C) $88 - 108$ MHz
(D) $540 - 1600$ KHz

Answer: (A) $5.9 - 6.4$ GHz · The council's preliminary key

Q70 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

The minimum size of an antenna for transmitting electromagnetic waves at 1500 MHz is

(A) 2 cm
(B) 5 cm
(C) 5 m
(D) 200 m

Answer: (B) 5 cm · The council's preliminary key

Q71 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

A message signal of frequency 8 kHz and peak voltage 12 V is used to modulate a carrier of frequency 1.2 MHz and peak voltage 20 V. The modulation index is

(A) 0.2
(B) 0.3
(C) 0.4
(D) 0.6

Answer: (D) 0.6 · The council's preliminary key

Q72 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

The maximum amplitude of an AM wave is found to be 20 V while its minimum amplitude is 4 V. The modulation index is

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(A) 0.33
(B) 0.67
(C) 0.44
(D) 0.63

Answer: (B) 0.67 · The council's preliminary key

Q73 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Frequencies in the UHF range normally propagate by means of

(A) Space waves
(B) Surface waves
(C) Ground waves
(D) Sky waves

Answer: (A) Space waves · The council's preliminary key

Q74 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The frequency suitable beyond the horizon communication using sky wave is

(A) $10\ \mathrm{KHz}$
(B) $10\ \mathrm{MHz}$
(C) $1\ \mathrm{GHz}$
(D) $1000\ \mathrm{GHz}$

Answer: (B) $10\ \mathrm{MHz}$ · The council's preliminary key

Q75 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

The maximum number of TV signals, that can be transmitted along a co-axial cable is

(A) 100
(B) 125
(C) 140
(D) 90

Answer: (B) 125 · The council's preliminary key

Q76 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A carrier wave is used to transmit a message signal. If the peak voltage of modulating signal and carrier signal are increased by 1% and 3% respectively, the modulation index is changed by

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(A) $-2\ \%$
(B) $4\ \%$
(C) $2\ \%$
(D) $-4\ \%$

Answer: (A) $-2\ \%$ · The council's preliminary key

Q77 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

A microwave telephone like operating at the central frequency of $10 \times 10^9\ Hz$ has been established if 2 % of this is available for microwave communication channel. How many telephone channels can be simultaneously granted if each telephone is allotted a bandwidth of 8 kHz?

(A) 1.5×10^3
(B) 3.5×10^2
(C) 2.5×10^4
(D) 4.5×10^6

Answer: (C) 2.5×10^4 · The council's preliminary key

Q78 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

In an amplitude modulation with modulation index 0.5, the ratio of the amplitude of the carrier wave to that of the side band in the modulated wave is _____

(A) $4:1$
(B) $1:4$
(C) $1:2$
(D) $2:1$

Answer: (A) $4:1$ · The council's preliminary key

Q79 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

In a communication system operating at wavelength $800\ \mathrm{nm}$, only one percent of source frequency is available as signal bandwidth. The number of channels accommodated for transmitting TV signals of bandwidth $6\ \mathrm{MHz}$ is _____

(A) $\frac{1}{25} \times 10^7$
(B) $\frac{1}{21} \times 10^7$
(C) $\frac{1}{16} \times 10^7$
(D) $\frac{1}{12} \times 10^7$

Answer: (C) $\frac{1}{16} \times 10^7$ · The council's preliminary key

Q80 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

If the highest modulating frequency of the wave is $5\ kHz$, the number of stations that can be accommodated in a $150\ kHz$ bandwidth is _____

(A) 20
(B) 15
(C) 10
(D) 5

Answer: (B) 15 · The council's preliminary key

Q81 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

In an amplitude modulated signal the maximum amplitude is $15\ \mathrm{V}$ and minimum amplitude is $5\ \mathrm{V}$. The amplitude of modulating wave will be

(A) $5\ \mathrm{V}$
(B) $10\ \mathrm{V}$
(C) $20\ \mathrm{V}$
(D) $30\ \mathrm{V}$

Answer: (A) $5\ \mathrm{V}$ · Checked by our team

Q82 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

For an amplitude modulated wave, the maximum amplitude is found to be 10 V while the minimum amplitude is found to be 4 V. The modulation index is

(A) $\frac{2}{5}$
(B) $\frac{2}{3}$
(C) $\frac{3}{7}$
(D) $\frac{4}{7}$

Answer: (C) $\frac{3}{7}$ · The council's preliminary key

Q83 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

A TV transmission tower of height h covers a range of distance 'd'. By how much will be the range change if the height is increased to $\frac{3}{2}h$

(A) $\sqrt{\frac{3}{2}}d$

(B) $\left(\sqrt{\frac{3}{2}}-1\right)d$

(C) $\left(\sqrt{\frac{3}{2}}+1\right)d$

(D) d

Answer: (B) $\left(\sqrt{\frac{3}{2}}-1\right)d$ · The council's preliminary key

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Q84 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

The height of transmitting antenna if TV programs have to cover the population in area of radius 64 km is [Use Radius of earth = 6.4×10^6 m]

(A) 160 m

(B) 200 m

(C) 240 m

(D) 320 m

Answer: (D) 320 m · The council's preliminary key

Q85 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

A carrier wave of peak voltage 15 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 80 %?

(A) 8 V

(B) 10 V

(C) 11 V

(D) 12 V

Answer: (D) 12 V · The council's preliminary key

Q86 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

A message signal of frequency f_m is used to modulate a carrier of frequency f_c. If the side bands are f_1 and f_2 then the ratio $\frac{f_c}{f_m}$ is

(A) $\left|\frac{f_1+f_2}{f_2-f_1}\right|$

(B) $\frac{(f_1+f_2)^2}{f_1 f_2}$

(C) $\left|\frac{f_1-f_2}{f_2+f_1}\right|$

(D) $\frac{f_1 f_2}{(f_1+f_2)^2}$

Answer: (A) $\left|\frac{f_1+f_2}{f_2-f_1}\right|$ · The council's preliminary key

Q87 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

A signal of 20 kHz is being carried on a carrier wave of 3 MHz. What are the side band frequencies?

(A) $3050\ \text{kHz}$ & $2950\ \text{kHz}$
(B) $3020\ \text{kHz}$ & $2970\ \text{kHz}$
(C) $3050\ \text{kHz}$ & $2980\ \text{kHz}$
(D) $3020\ \text{kHz}$ & $2980\ \text{kHz}$

Answer: (D) $3020\ \text{kHz}$ & $2980\ \text{kHz}$ · The council's preliminary key

Q88 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A T.V. tower has a height of $100\ m$. The average population density around the tower is $1000\ km^{-2}$ and radius of the earth is $6.37 \times 10^6 m$. The population covered is _____

(A) 4×10^6
(B) 6×10^4
(C) 16×10^4
(D) 8×10^6

Answer: (A) 4×10^6 · The council's preliminary key

Q89 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

For television broadcasting, the frequency employed is normally in range _____

(A) $30 - 300\ \text{MHz}$
(B) $30 - 300\ \text{GHz}$
(C) $30 - 300\ \text{kHz}$
(D) $30 - 300\ \text{Hz}$

Answer: (A) $30 - 300\ \text{MHz}$ · The council's preliminary key

Q90 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A speech signal of 3 kHz is used to modulate a carrier signal of frequency 1 MHz, using amplitude modulation. The frequencies of the side bands will be _____

(A) 1.003 MHz & 0.997 MHz
(B) 3001 kHz & 2997 kHz
(C) 1003 kHz & 1000 kHz
(D) 1.0 MHz & 0.997 MHz

Answer: (A) 1.003 MHz & 0.997 MHz · The council's preliminary key

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Q91 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

An AM wave has $1800\ \mathrm{W}$ of total power content, for 100% modulation the carrier should have power content equal to

(A) $1000\ \mathrm{W}$
(B) $1200\ \mathrm{W}$
(C) $1500\ \mathrm{W}$
(D) $1600\ \mathrm{W}$

Answer: (B) $1200\ \mathrm{W}$ · The council's preliminary key

Q92 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

The function of a detector is to demodulate the modulated carrier wave and the steps for this process are

(A) demodulation and filtering
(B) demodulation and rectification
(C) rectification and filtering
(D) regeneration and filtering

Answer: (C) rectification and filtering · Official TGCHE final key

Q93 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

A message signal of frequency $\frac{50}{\pi}$ kHz and peak voltage of 5 V is used to modulate a carrier of frequency 1 MHz and peak voltage 20 V. The modulation index is

(A) $\frac{\pi}{10}$
(B) 0.4
(C) 0.5
(D) 0.25

Answer: (D) 0.25 · Official TGCHE final key

Q94 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A message signal is super-imposed with a carrier signal. The resulting modulating signal $C_m(t)$ is given by $C_m(t) = A_1 \sin(\omega_1 t) + A_2 \sin(\omega_2 t) - A_2 \sin(\omega_3 t)$ where $\omega_2 < \omega_1 < \omega_3$. The modulation index and the angular frequency of the message signal respectively are

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(A) $\frac{A_2}{A_1}, \frac{\omega_3 - \omega_2}{2}$
(B) $\frac{2A_2}{A_1}, \omega_3 - \omega_2$
(C) $\frac{A_1}{2A_2}, \frac{\omega_3 - \omega_2}{2}$
(D) $\frac{2A_2}{A_1}, \frac{\omega_3 - \omega_2}{2}$

Answer: (D) $\frac{2A_2}{A_1}, \frac{\omega_3 - \omega_2}{2}$ · Official TGCHE final key

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Q95 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

The electromagnetic waves of frequency 6 GHz are used in

(A) FM broadcast
(B) TV communication
(C) Satellite communication
(D) Cellular mobile radio

Answer: (C) Satellite communication · Official TGCHE final key

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Q96 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

A message signal of frequency 10 KHz and peak voltage of 15 volts is used to modulate a carrier frequency of 1 MHz and peak voltage of 30 volts. Determine the modulation index.

(A) 5
(B) 6
(C) 7
(D) 8

Answer: (A)

1. 5

· Official TGCHE final key

Q97 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

Assertion (A): Television signals are received through sky- wave propagation
Reason(R): The iono sphere reflects electromagnetic waves of frequencies in the range (3 - 30) M Hz
The correct option among the following is

(A) (A) is true, (R) is true and (R) is the correct explanation for (A)
(B) (A) is true, (R) is true but (R) is not the correct explanation for (A)
(C) (A) is true but (R) is false
(D) (A) is false but (R) is true

Answer: (D) (A) is false but (R) is true · Official TGCHE final key

Q98 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

A carrier signal of frequency ν_1 and peak voltage of V_1 is modulated by a message signal of frequency ν_2 and peak voltage of V_2. Let m be the modulation index and ν_+, ν_- be side bands produced. The correct statement is

(A) $m = \frac{V_1}{V_2}$
(B) $\nu_1 = \frac{\nu_+ + \nu_-}{2}$
(C) $\nu_2 = \frac{\nu_+ + \nu_-}{2}$
(D) $m > \frac{V_2}{V_1}$

Answer: (B) $\nu_1 = \frac{\nu_+ + \nu_-}{2}$ · Official TGCHE final key

Q99 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

The modulation index used in amplitude modulation of a message signal of peak voltage 10 volts is 0.5. By how much the peak voltage of the carrier signal be changed so as to obtain the modulation index of 0.8, keeping the peak voltage of the message signal same as before.

(A) increase by 7.5 V
(B) reduce by 7.5 V
(C) increase by 12.5 V
(D) reduce by 12.5 V

Answer: (B) reduce by 7.5 V · Official TGCHE final key

Q100 TS EAMCET 2019 · 6 May · Shift 1 MCQ

A message signal is used to modulate a carrier signal of frequency 5 MHz and peak voltage of 40 V. In the process, two sidebands are produced seperated by 40 KHz. If the modulation index is 0.75, then the peak voltage and frequency of the message signal respectively are:

(A) 60 V ; 10 KHz
(B) 60 V ; 20 KHz
(C) 30 V ; 10 KHz
(D) 30 V ; 20 KHz

Answer: (D) 30 V ; 20 KHz · Official TGCHE final key

Q101 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A transmitting antenna has a height 20 m. What will be the height of receiving antenna, if the maximum distance between them for satisfactory communication in line-of-sight (LOS) mode is 40 km? (The earth radius is 6400 km)

(A) $25\ \mathrm{m}$
(B) $30\ \mathrm{m}$
(C) $60\ \mathrm{m}$
(D) $45\ \mathrm{m}$

Answer: (D) $45\ \mathrm{m}$ · Official TGCHE final key

Q102 TS EAMCET 2019 · 4 May · Shift 2 MCQ

Carrier waves are used for communicating signals over a long distance, because

(A) Carrier waves can be generated very easily
(B) Low frequencies can not be easily modulated by the carrier waves
(C) Low frequencies can be transmitted over long distances
(D) Carrier waves that are generated at higher frequencies can be transmitted over long distances

Answer: (D) Carrier waves that are generated at higher frequencies can be transmitted over long distances · Official TGCHE final key

Q103 TS EAMCET 2019 · 3 May · Shift 1 MCQ

A message signal is used to modulate a carrier frequency. If the peak voltages of message signal and carrier signal are increased by 0.1% and 0.3% respectively, then the percentage change in modulation index is

(A) 0.4
(B) 0.0
(C) -0.4
(D) -0.2

Answer: (D) -0.2 · Official TGCHE final key

Q104 TS EAMCET 2019 · 3 May · Shift 2 MCQ

The transmitting antenna placed at the top of a tower has a height of $45\ \mathrm{m}$ from the ground. The distance between receiving and transmitting antennas is $40\ \mathrm{km}$ and the radius of earth is $6400\ \mathrm{km}$. The minimum height (in m) at which the receiving antenna is to be placed for satisfactory communication in LOS mode, is

(A) 5
(B) 15
(C) 20
(D) 25

Answer: (C) 20 · Official TGCHE final key

Q105 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

If E_c and E_m are peak values of carrier and modulating signals respectively then for 100% modulation

(A) $E_c = \frac{E_m}{2}$
(B) $\frac{E_c^2}{2} = E_m^2$
(C) $E_c = E_m$
(D) $E_c = 2E_m$

Answer: (C) $E_c = E_m$ · Official APSCHE final key

Q106 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

A TV tower has a height 160 m. Its coverage range is nearly (Earth's radius = 6400 km)

(A) 45255 m
(B) 55265 m
(C) 452.55 km
(D) 552.65 m

Answer: (A) 45255 m · Official APSCHE final key

Q107 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

Coaxial cable, a widely used wire medium for transmission of signals offers a bandwidth of approximately

(A) $600\ \text{kHz}$
(B) $750\ \text{MHz}$
(C) $850\ \text{GHz}$
(D) $500\ \text{Hz}$

Answer: (B) $750\ \text{MHz}$ · Official APSCHE final key

Q108 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A transmitting antenna of height 20 m and the receiving antenna of height 'h' are separated by a distance of 40 km for satisfactory communication in line of sight mode. Then the value of 'h' is (Given Radius of earth is 6400 km)

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(A) 40 m
(B) 45 m
(C) 30 m
(D) 25 m

Answer: (B) 45 m · Official APSCHE final key

Q109 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

The frequency suitable for beyond-the-horizon communication using sky waves is

(A) 10^{12} Hz
(B) 10^{9} Hz
(C) 10^{7} Hz
(D) 10^{4} Hz

Answer: (C) 10^{7} Hz · Official APSCHE final key

Q110 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

A signal of frequency 10 kHz and peak voltage 10 V is used to amplitude modulate a carrier of frequency 1 MHz and peak voltage 20 V. The side band frequencies in kHz are

(A) 1010, 990
(B) 910, 1090
(C) 10, 11
(D) 1.01, 0.99

Answer: (A) 1010, 990 · Official APSCHE final key

Q111 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

A TV tower has a height of 5 m in a region of population density $\frac{1000}{\pi}$ per square kilometer. Number of people that can receive the transmission is nearly (in thousands)

(A) 128
(B) 64
(C) 256
(D) 32

Answer: (B) 64 · Official APSCHE final key

Q112 TS EAMCET 2018 · 7 May · Shift 1 MCQ

For a television network, 5×10^5 channels are granted. If the central frequency of the microwave link is 25 GHz and the alloted bandwidth for each channel is 2 kHz, how much percentage of the link is used for the network?

(A) 4%
(B) 10%
(C) 25%
(D) 5%

Answer: (A) 4% · The council's preliminary key

Q113 TS EAMCET 2018 · 5 May · Shift 1 MCQ

A transmitting and receiving antenna have height of 'd' meters each. The maximum distance between them for satisfactory communication in Line-of-Sight mode (LOS) is $2d$ kilometers. If the radius of earth is 6400 km, then the value of d is

(A) 3.2 m
(B) 6.4 m
(C) 12.8 m
(D) 16.0 m

Answer: (C) 12.8 m · The council's preliminary key

Q114 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The height of a transmission antenna is $49\ \mathrm{m}$ and that of the receiving antenna is $64\ \mathrm{m}$. What should be the maximum distance between them for line of sight transmission?

(A) $50.1\ \mathrm{km}$
(B) $53.6\ \mathrm{km}$
(C) $43.6\ \mathrm{km}$
(D) $65.2\ \mathrm{km}$

Answer: (B) $53.6\ \mathrm{km}$ · The council's preliminary key

Q115 TS EAMCET 2018 · 4 May · Shift 1 MCQ

A carrier wave of peak voltage 20 V is used to transmit a message signal. For getting modulation index of 60%, the peak voltage of the modulating signal is

(A) 6 V
(B) 8 V
(C) 12 V
(D) 33.3 V

Answer: (C) 12 V · The council's preliminary key

Q116 TS EAMCET 2018 · 4 May · Shift 2 MCQ

A person tries to broadcast with the same antenna both the signals at 10^7 Hz and 10^6 Hz. If the receiver at some distance has to receive an equal strength for both the frequencies, the broadcaster

has to approximately increase the signal strength at 10^6 Hz to 10^7 Hz by

(A) $\frac{1}{10}$ times
(B) 10 times
(C) 100 times
(D) $\frac{1}{100}$ times

Answer: (C) 100 times · The council's preliminary key

Q117 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A modulated signal is given by $C_m(t) = A_c \sin \omega_c t + \mu A_c \sin \omega_m t \sin \omega_c t$ where μ is modulation index. To keep the signal without distortion, the value of μ should be

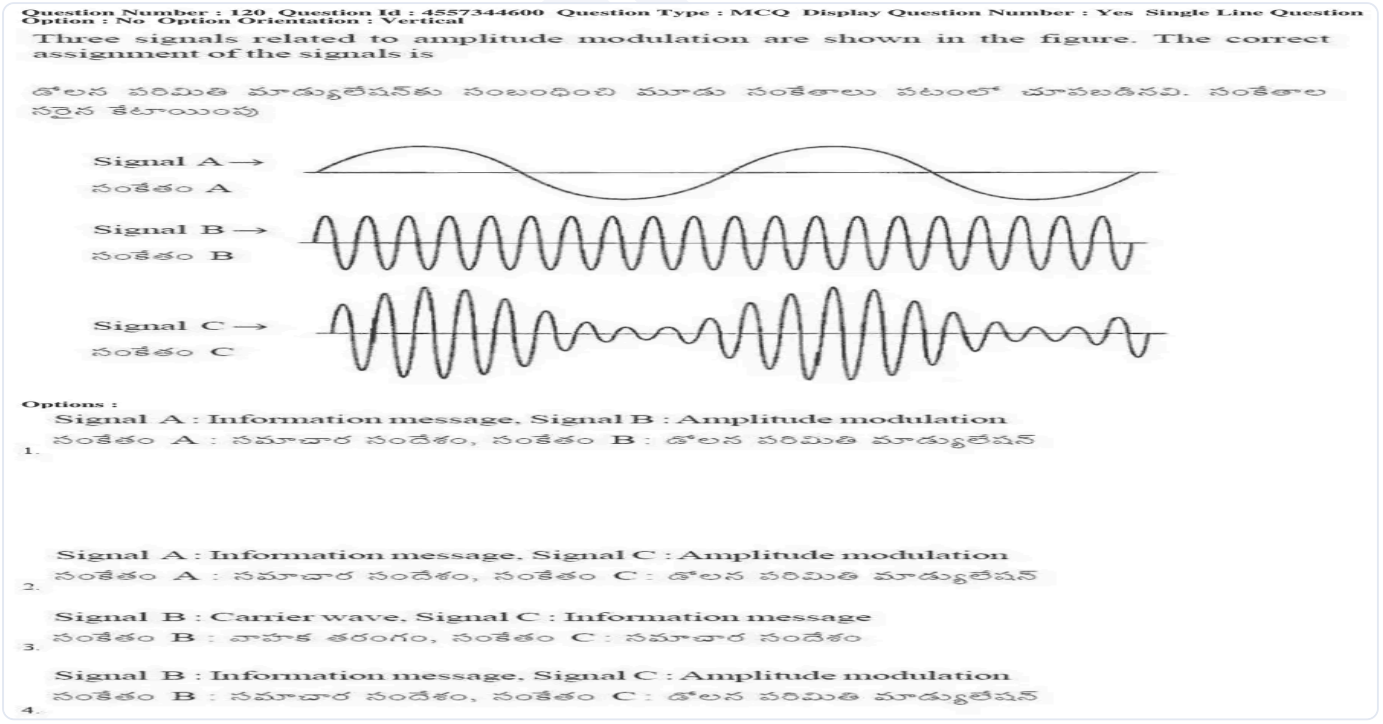
(A) > 1
(B) ≥ 1
(C) $= 1$
(D) ≤ 1

Answer: (D) ≤ 1 · The council's preliminary key

Q118 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Three signals related to amplitude modulation are shown in the figure. The correct assignment of the signals is

(see the figure above)



(A) Signal A : Information message, Signal B : Amplitude modulation
(B) Signal A : Information message, Signal C : Amplitude modulation
(C) Signal B : Carrier wave, Signal C : Information message
(D) Signal B : Information message, Signal C : Amplitude modulation

Answer: (B) Signal A : Information message, Signal C : Amplitude modulation · The council's preliminary key

Q119 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

A TV transmitter has a range of 50 km. The height of the TV transmitter is _____
(Radius of the earth $R_e = 6.4 \times 10^6$ m)

(A) 195.3 m
(B) 186.5 m
(C) 206 m
(D) 175 m

Answer: (A) 195.3 m · The council's preliminary key

Q120 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

If the height of the transmitting tower is increased by 30%, the area covered by it increases by

(A) 10%
(B) 21%
(C) 30%
(D) 60%

Answer: (C) 30% · The council's preliminary key

Q121 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

If a message signal of frequency $10\ \text{kHz}$ and peak voltage $12\ \text{V}$ is used to modulate a carrier wave of frequency $1\ \text{MHz}$, the modulation index is 0.6. To make the modulation index 0.75, the carrier peak voltage should be

(A) decreased by 25%
(B) increased by 25%
(C) decreased by 20%
(D) increased by 20%

Answer: (C) decreased by 20% · The council's preliminary key

Q122 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

The maximum distance between the transmitting and receiving TV towers is 65 km. If the ratio of the heights of the TV transmitting tower to receiving tower is 36 : 49, the heights of the transmitting and receiving towers respectively are (Radius of earth 6400 km)

(A) $51.2\ \text{m},\ 80\ \text{m}$
(B) $70.3\ \text{m},\ 95.7\ \text{m}$
(C) $30\ \text{m},\ 65\ \text{m}$
(D) $25\ \text{m},\ 75\ \text{m}$

Answer: (B) $70.3\ \text{m},\ 95.7\ \text{m}$ · The council's preliminary key

Q123 TS EAMCET 2017 · 12 May · Offline MCQ

An amplitude modulated signal consists of a message signal of frequency 1 KHz and peak voltage of 5V, modulating a carrier frequency of 1 MHz and peak voltage of 15V. The correct description of this signal is

(A) $5\left[1+3\sin(2\pi 10^6 t)\right]\sin(2\pi 10^3 t)$
(B) $15\left[1+\frac{1}{3}\sin(2\pi 10^3 t)\right]\sin(2\pi 10^6 t)$
(C) $\left[5+15\sin(2\pi 10^3 t)\right]\sin(2\pi 10^6 t)$
(D) $\left[15+5\sin(2\pi 10^6 t)\right]\sin(2\pi 10^3 t)$

Answer: (B) $15\left[1+\frac{1}{3}\sin(2\pi 10^3 t)\right]\sin(2\pi 10^6 t)$ · The council's preliminary key

Q124 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

The process of recovering the modulating signal from the modulated carrier wave is called

(A) Amplification
(B) Rectification
(C) Noise
(D) Detection

Answer: (D) Detection · The council's preliminary key

Q125 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Match the following :
List - I (Signal)
i) Speech Signal
ii) Music Signal
iii) Video Signal
iv) T.V. Signal
List - II (Bandwidth)
a) $4.2\ \text{MHz}$
b) $6\ \text{MHz}$
c) $20\ \text{KHz}$
d) $2.8\ \text{KHz}$
The correct answer is

(A) i-c, ii-d, iii-b, iv-a
(B) i-a, ii-d, iii-b, iv-c
(C) i-d, ii-c, iii-a, iv-b
(D) i-b, ii-a, iii-d, iv-c

Answer: (C) i-d, ii-c, iii-a, iv-b · The council's preliminary key

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Q126 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

If the length of an antenna is 150 cm, the transmission frequency is _____ MHz (Speed of light in vacuum = $3 \times 10^8\ \mathrm{ms}^{-1}$)

(A) 25
(B) 150
(C) 50
(D) 100

Answer: (C) 50 · The council's preliminary key

Q127 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

TV transmission antenna at a particular station has a height of 100 m. By how much the height of the antenna is to be increased to double its coverage range?

(A) $41.4\ \mathrm{m}$
(B) $121.4\ \mathrm{m}$
(C) $70.7\ \mathrm{m}$
(D) $100\ \mathrm{m}$

Answer: (D) $100\ \mathrm{m}$ · Checked by our team

Q128 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A TV tower has a height of 150 m. If the population density around the TV tower is $10^3\ \mathrm{km}^{-2}$ then the population covered by the tower is (Radius of the earth, $R = 6.4 \times 10^6\ \mathrm{m}$)

(A) 60.288 lakh
(B) 40.192 lakh
(C) 106.486 lakh
(D) 26.428 lakh

Answer: (A) 60.288 **lakh** · The council's preliminary key

Q129 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

If two linear antennas having lengths in the ratio 2 : 3 are emitting radiation of wavelength in the ratio 8 : 9, then the ratio of effective powers radiated by them are in the ratio

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(A) 32 : 27
(B) 27 : 32
(C) 16 : 27
(D) 9 : 16

Answer: (D) 9 : 16 · Checked by our team

Q130 TS EAMCET 2016 · 15 May · Offline MCQ

A message signal of 12 kHz and peak voltage 20 V is used to modulate a carrier wave of frequency 12 MHz and peak voltage 30 V. Then the modulation index is

(A) 0.32
(B) 6.7
(C) 0.67
(D) 67

Answer: (C) 0.67 · Official TGCHE final key

Q131 AP EAMCET 2016 · 29 Apr · Offline MCQ

If a transmitting antenna of height 105m is placed on a hill, then its coverage area is

(A) $4224\ \text{km}^2$
(B) $3264\ \text{km}^2$
(C) $6400\ \text{km}^2$
(D) $4864\ \text{km}^2$

Answer: (A) $4224\ \text{km}^2$ · The council's preliminary key

Q132 AP EAMCET 2014 · 22 May · Offline MCQ

A T.V transmitting Antenna is 128 m tall. If the receiving Antenna is at the ground level, the maximum distance between them for satisfactory communication in L.O.S. mode is, (Radius of the earth = 6.4×10^6 m)

(A) $64 \times \sqrt{10}$ km
(B) $\frac{128}{\sqrt{10}}$ km
(C) $128 \times \sqrt{10}$ km
(D) $\frac{64}{\sqrt{10}}$ km

Answer: (B) $\frac{128}{\sqrt{10}}$ km · The council's preliminary key

Q133 AP EAMCET 2012 · 12 May · Offline MCQ

Match column A (layers in the ionosphere for skywave propagation) with column B (their height range) :

Column A
I) D-layer
II) E-layer
III) F_1-layer
IV) F_2-layer
Column B
a) 250-400 km
b) 170-190 km
c) 95-120 km
d) 65-75 km
The correct answer is

(A) I-a, II-b, III-c, IV-d
(B) I-d, II-c, III-a, IV-b
(C) I-d, II-c, III-b, IV-a
(D) I-c, II-d, III-c, IV-b

Answer: (C) I-d, II-c, III-b, IV-a · Official APSCHE final key

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