

Principles of Electronic Communication (313326)

MSBTE K-Scheme · Electronics & Telecommunication (EJ) · Sem III · Important Questions

Based on MSBTE papers S-2024...S-2026 available on msbte.ac.in (papers analysed: W-24, S-25, W-25, S-26). Practice guidance only — not a prediction of the exam.

Probability: **High** = asked in 3 or 4 of the 4 papers · **Medium** = asked in 2 papers · **Low** = asked once, or in syllabus but not asked yet. Questions asked in different wording are grouped together.

Paper pattern (all 4 papers): Q1 any 5 of 7 (2 M) = 10; Q2 any 3 of 4 (4 M) = 12; Q3 any 3 of 4-5 (4 M) = 12; Q4 any 3 of 4-5 (4 M) = 12; Q5 any 2 of 3 (6 M) = 12; Q6 any 2 of 3 (6 M) = 12; total 70, 3 hours.

Unit 1: Basics of Electronic Communication

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Frequency ranges of EM spectrum bands / choose frequency range for applications (voice, HF, AM/FM/TV broadcast, mobile, satellite, power line ...)	2, 4, 6	S-26 (1a/5b), W-25 (3a), S-25 (2a), W-24 (5a)	5	High
Modes of communication: simplex / half duplex / full duplex / quadra-duplex (define, differentiate, diagram, example)	2, 4	S-26 (2b), S-25 (1b), W-24 (1a)	3	High
Analog and digital signal - definition with sketch	2	W-25 (1a), S-25 (1a)	2	Medium
Synchronous vs asynchronous transmission; serial transmission	4, 6	S-25 (5a), W-24 (2a)	2	Medium
Block diagram of basic (analog) communication system - function of each block	4, 6	S-26 (2a), W-25 (5a)	2	Medium
Noise - definition, external noise, types of noise	2, 4	S-26 (1b), W-25 (2a)	2	Medium
Signal to noise ratio - definition / SNR in dB numerical	2	W-25 (1f), W-24 (1b)	2	Medium
Electromagnetic wave is a transverse wave - justify	4	W-24 (2b)	1	Low
Parallel transmission; quadrature / quadra-duplex details (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 2: Amplitude Modulation (AM transmitters and receivers)

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
AM superheterodyne receiver - principle, block diagram, waveforms, identify blank blocks (mixer /	4, 6	S-26 (6a), W-25 (2b/6a), S-	5	High

detector / local oscillator)		25 (6a), W-24 (3a)		
AM power numericals: total power, sideband power, efficiency, two-tone modulation, comparing transmitters	2, 4, 6	S-26 (2d), W-25 (1g), S-25 (4a), W-24 (6a)	4	High
Modulation index of AM - effect of $m < 1$, $m = 1$, $m > 1$ ($m = 0$) with waveforms	4, 6	S-26 (3c), S-25 (5b), W-24 (5b)	3	High
AM transmitter block diagram - high level / low level	2, 4	S-26 (4c), S-25 (1c), W-24 (4a)	3	High
AM frequency components / bandwidth formula / spectrum numerical (from equation)	2, 6	S-26 (5a), S-25 (1d), W-24 (1c)	3	High
Value of IF in AM (MW) and FM receivers	2	W-25 (2b), W-24 (1f)	2	Medium
Sensitivity and selectivity of radio receiver	2	S-26 (1d), W-25 (1b)	2	Medium
Types of AM w.r.t. spectrum; compare DSB-FC, DSB-SC and SSB	2, 6	S-26 (1c), W-25 (5b)	2	Medium
Need of modulation	2	W-24 (1e)	1	Low
Practical AM diode detector - circuit and waveforms	4	S-25 (3a)	1	Low
Fidelity, image frequency, AGC (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 3: Angle Modulation (FM / PM)

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
FM deviation ratio and bandwidth (Carson's rule / significant sidebands) numerical	4	S-26 (3a), W-25 (3b), S-25 (2d)	3	High
Narrow band FM vs wide band FM	4	S-26 (2c), W-25 (4d), S-25 (4b)	3	High
PLL as FM demodulator - block diagram and working	4, 6	W-25 (6b), S-25 (3b), W-24 (2d)	3	High
List methods / types of FM detectors (FM receiver)	2, 6	S-26 (1e), W-25 (6b), S-25 (1e)	3	High
FM wave equation numerical: carrier frequency, modulating frequency, modulation index, power in resistor	6	W-25 (6c), S-25 (5c)	2	Medium
FM wave in time domain / frequency domain	2, 6	S-25 (5c), W-24 (1d)	2	Medium

Compare AM and FM	4, 6	S-26 (5c), W-24 (2c)	2	Medium
Phase modulation definition; compare FM and PM	2, 4	W-25 (1c), W-24 (4b)	2	Medium
Pre-emphasis and de-emphasis	4, 6	S-25 (2b), W-24 (5c)	2	Medium
FM generation - varactor diode modulator / Armstrong (indirect) method	4	S-26 (4a), W-25 (4e)	2	Medium
Slope detector, Foster-Seeley / ratio detector, FM receiver block diagram (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 4: Wave Propagation

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Name ionospheric layers satisfying given conditions (D, E, F1, F2)	4	S-26 (3b), W-25 (4a), S-25 (3c)	3	High
Find type of propagation for applications (AM/FM broadcast, ship-to-shore, microwave link, satellite)	4	W-25 (3c), S-25 (3e), W-24 (3c)	3	High
Compare sky wave and space wave propagation	2, 4	S-26 (4e), W-25 (1d), S-25 (2c)	3	High
Sky wave terms: MUF, critical frequency, virtual / actual height, skip distance	2, 4	S-26 (1f), S-25 (4c), W-24 (4d)	3	High
Ground wave propagation - characteristics / sketch / compare with sky wave	2, 4	S-26 (4b), S-25 (1f), W-24 (3b)	3	High
Fading - concept and reasons	2, 4	S-26 (1f), W-25 (4c)	2	Medium
Sky wave propagation with sketch	4	W-24 (4c)	1	Low
Reflection, refraction, diffraction, polarization	4	W-25 (2c)	1	Low
Line-of-sight distance, duct propagation, tropospheric scatter (syllabus)	—	Not asked yet (syllabus)	0	Low

Unit 5: Antennas

Question / topic	Marks	Asked in (Q. no.)	Times	Probability
Radiation pattern of resonant dipoles ($L = \lambda/2, \lambda, 3\lambda/2, 3\lambda$)	4, 6	S-26 (4d), W-25 (3d), S-25 (6b)	3	High

Compare resonant and non-resonant antenna	4	S-26 (3d), W-25 (2d), W-24 (4e)	3	High
Microstrip patch antenna - structure, radiation pattern, advantages	4, 6	S-26 (6b), W-25 (5c), S-25 (4d)	3	High
Applications of antennas / choose proper antenna (loop, Yagi, dish, horn, patch, smart, telescopic ...)	4, 6	S-26 (6c), W-25 (4b), W-24 (6c)	3	High
Half wave dipole antenna with radiation pattern	2, 4	S-26 (1g), S-25 (3d)	2	Medium
Yagi-Uda antenna - sketch, radiation pattern, function of elements	2, 4	S-25 (1g), W-24 (3d)	2	Medium
Loop antenna / ferrite rod antenna (sketch, pattern, comparison)	2	W-25 (1e), W-24 (1g)	2	Medium
Dish (parabolic reflector) antenna - construction, principle, pattern	6	W-24 (6b)	1	Low
Antenna definition; radiation pattern, beam width (antenna terms)	6	S-25 (6c)	1	Low
Folded dipole antenna - advantages	2	S-25 (6b)	1	Low
Horn antenna, smart antenna, gain / directivity / polarization (syllabus)	—	Not asked yet (syllabus)	0	Low

Top repeated topics (all units)

1. Frequency ranges of EM spectrum bands / choose frequency range for applications (voice, HF, AM/FM/TV broadcast, mobile, satellite, power line ...) — in 4 of 4 papers (5 times)
2. AM superheterodyne receiver - principle, block diagram, waveforms, identify blank blocks (mixer / detector / local oscillator) — in 4 of 4 papers (5 times)
3. AM power numericals: total power, sideband power, efficiency, two-tone modulation, comparing transmitters — in 4 of 4 papers (4 times)
4. Modes of communication: simplex / half duplex / full duplex / quadra-duplex (define, differentiate, diagram, example) — in 3 of 4 papers (3 times)
5. Modulation index of AM - effect of $m < 1$, $m = 1$, $m > 1$ ($m = 0$) with waveforms — in 3 of 4 papers (3 times)
6. AM transmitter block diagram - high level / low level — in 3 of 4 papers (3 times)
7. AM frequency components / bandwidth formula / spectrum numerical (from equation) — in 3 of 4 papers (3 times)
8. FM deviation ratio and bandwidth (Carson's rule / significant sidebands) numerical — in 3 of 4 papers (3 times)
9. Narrow band FM vs wide band FM — in 3 of 4 papers (3 times)
10. PLL as FM demodulator - block diagram and working — in 3 of 4 papers (3 times)

How to use: prepare every High topic fully (diagram + table + example), then Medium topics. Numericals (AM power, AM/FM bandwidth, modulation index, FM equation, SNR, MUF) come with new values every time — practise the method, not the answer.

Note: This is a **important-questions list prepared by Ananda Technologies** only for practice and exam preparation, based on the pattern of previous MSBTE question papers and the K-scheme syllabus. It is **not an official MSBTE paper**, and it does **not** mean that these questions will come in the exam. Answers follow standard textbook points; marks shown are indicative. Free for students — anandatechnologies.in

