



Paper id: 252794

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Subject Code: KEC401

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**BTECH**  
**(SEM IV) THEORY EXAMINATION 2024-25**  
**COMMUNICATION ENGINEERING**

**TIME: 3 HRS****M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

**SECTION A****1. Attempt all questions in brief.****2 x 10 = 20**

Q No.	Question	CO	Level
a.	Explain need of modulation in communication.	1	K2
b.	If modulation percentage of an amplitude modulated system is 100 %, then determine its efficiency.	1	K2
c.	What is the significance of pre-emphasis in FM transmission?	2	K2
d.	Explain narrowband FM and its significance.	2	K2
e.	What do you mean by random variable?	3	K2
f.	State the main characteristics of white noise.	3	K1
g.	What is slope overload distortion in Delta Modulation?	4	K2
h.	Define sampling and state Nyquist criterion.	4	K2
i.	Compare binary FSK and MSK in terms of bandwidth and performance.	5	K4
j.	List the advantages of QAM over PSK.	5	K2

**SECTION B****2. Attempt any three of the following:****10 x 3 = 30**

a.	For an AM signal show that modulation index $m = \frac{V_{max} - V_{min}}{V_{max} + V_{min}}$ , also derive that power expression for AM signal.	1	K3
b.	Explain the generation and detection of a Frequency Modulated (FM) signal using indirect method (Armstrong method).	2	K3
c.	Explain the role of pre-emphasis and de-emphasis in FM transmission. Discuss the concept of threshold effect in FM.	3	K4
d.	Explain Pulse Code Modulation (PCM) with a neat block diagram.	4	K3
e.	Illustrate the Modulator and Demodulator for Amplitude Shift Keying.	5	K3

**SECTION C****3. Attempt any one part of the following:****10 x 1 = 10**

a.	What do you mean by Communication? Explain the elements of the communication system with the help of block diagrams.	1	K2
b.	Draw and explain the modulator and demodulator of DSB-SC.	1	K2

**4. Attempt any one part of the following:****10 x 1 = 10**

a.	With help of neat block diagram, discuss how FM wave is generated using AM wave and its vice-versa.	2	K3
b.	Define phase modulation. Demonstrate the fundamental of the generation of FM with the help of PM and similarly the generation of PM with the help of FM.	2	K3

**5. Attempt any one part of the following:****10 x 1 = 10**

a.	Compare the effect of noise on Amplitude Modulation (AM) and Frequency Modulation (FM) systems. Which system performs better in noisy environments and why?	3	K4
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b.	Write short notes on various types of noise commonly encountered in communication systems.	3	K2
<b>6.</b>	<b>Attempt any <i>one</i> part of the following:</b>	<b>10 x 1 = 10</b>	
a.	Draw and explain the block diagram of transmitter, channel, and receiver of PCM system.	4	K2
b.	State and prove the Sampling Theorem for low-pass signals.	4	K3
<b>7.</b>	<b>Attempt any <i>one</i> part of the following:</b>	<b>10 x 1 = 10</b>	
a.	With help of wave forms, explain amplitude shift keying. Also draw the block diagram of its modulator and demodulator.	5	K3
b.	Explain how Minimum Shift Keying (MSK) achieves continuous phase transmission.	5	K3

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