CBCS SCHEME

USN | | | | | | | | | | |

18EC751

Seventh Semester B.E. Degree Examination, July/August 2022
Communication Theory

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Draw the electromagnetic frequency spectrum and explain the various RF spectrum bands. **(10 Marks)**

b. Explain the three distinct modes of transmission for any communication link. **(06 Marks)**

c. Define Decibels (db). Determine the power gain in db for an amplifier having input signal power of 1W and output signal power of 10W. **(04 Marks)**

OR

2 a. With a neat block diagram, explain the elementary communication system. **(08 Marks)**

b. Explain the advantages of using Digital Transmission Techniques. **(06 Marks)**

c. With a neat block diagram, explain Frequency Division Multiplexing (FDM). **(06 Marks)**

Module-2

3 a. Differentiate between Noise and Distortion. Explain the classification of noise. **(08 Marks)**

b. Define Amplitude Modulation (AM). Draw the power spectrum of AM signal and derive the expression for total power in an AM signal. **(08 Marks)**

c. Explain the limitations of Amplitude Modulation. **(04 Marks)**

OR

4 a. Define Frequency Modulation (FM) and derive the expression for FM signal. **(07 Marks)**

b. With the help of suitable waveforms, explain Phase Modulation (PM). **(05 Marks)**

c. With a neat block diagram, explain AM super heterodyne Radio Receiver. **(08 Marks)**

Module-3

5 a. What is Aliasing effect? How it can be overcome? **(07 Marks)**

b. Give the comparison of Digital Transmission and Analog Transmission. **(05 Marks)**

c. State Sampling Theorem and prove the same for baseband signal. **(08 Marks)**

OR

6 a. What is Pulse Modulation? How it is different from analog modulation? Give the classification of pulse modulation. **(07 Marks)**

b. What is Quantization? Give the classification of quantization process. **(05 Marks)**

c. Explain the generation and detection of PAM signal. **(08 Marks)**

Module-4

7 a. What is ASK? Draw the waveforms of ASK and explain the block diagram of ASK modulator. **(08 Marks)**

b. Write a note on QPSK. **(04 Marks)**

c. Draw the waveforms of BFSK and explain the block diagram of BFSK modulator. **(08 Marks)**

OR

8	a.	State and explain Shannon's source coding theorem.	**(06 Marks)**
	b.	What is source coding? Why it is needed?	**(06 Marks)**
	c.	State and explain channel coding theorem.	**(08 Marks)**

Module-5

9	a.	Explain the advantages and disadvantages of wireless communication.	**(06 Marks)**
	b.	Explain the different wireless network generations.	**(08 Marks)**
	c.	Explain the applications of wireless communication.	**(06 Marks)**

OR

10	a.	Explain the concept of frequency Re-use.	**(06 Marks)**
	b.	Explain cell structure and cluster in cellular systems.	**(06 Marks)**
	c.	Assume a cellular system of 32 cells with a cell radius of 1.6 km, a total spectrum allocation that supports 336 traffic channels and a reuse pattern of 7. Calculate the total service area covered with this configuration, the number of channels per cell and a total system capacity. Assume regular hexagonal cellular topology. Let the cell size be reduced to the extent that the same area as covered above with 128 cells. Find the radius of new cell and new system capacity.	**(08 Marks)**

* * * * *