R17 Regulation *Subject code: 1P4DD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech II Year II Semester Supplementary Examinations, July 2024

ANALOG COMMUNICATIONS

(ECE)

Maximum Marks: 70 Date:25.07.2024 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

Q.NO	QUESTIONS	Mark
1	Explain time division multiplexing?	2
2	What is ring modulator?	2
3	Categorize and compare all AM techniques.	2
4	List the applications of different AM systems.	2
5	Calculate the average power of an FM signal.	2
6	Write the disadvantages of FM systems?	2
7	Classify the sources of Noise?	2
8	Define Shot noise?	2
9	What are image frequencies? Explain.	2
10	What is the need for AGC circuit?	2

Part-B

Answer All the following questions. (10M X 5=50Marks)

11.a	Explain switching modulator.	6
b.	A standard AM transmission, sinusoidally modulated to depth of 40%, produces side band frequencies of 6.824 and 6.854 MHz. The amplitude of each sideband frequency is 50v.Determine the amplitude and frequency of the carrier?	4
	OR	
12.a	Use the envelope detector to generate AM wave with a neat sketch.	6
b	Consider an AM signal $\phi_{am}(t) = (1+ A\cos\omega_m t)\cos\omega_c t$, where the message signal frequency ω_m = 5 KHz and the carrier frequency, ω_c = 100 KHz. The constant A = 15. Can this signal be demodulated by an envelope detector? What will be the output of the envelope detector? Find the frequency spectrum of the envelope detector output.	4
13	List out the various methods used to generate SSB signals with neat sketches.	10
	OR	
14	Evaluate the expression for VSB along with need of VSB modulation.	

		10
15.a	Derive the expression for FM signal from fundamentals and differentiate narrow band FM and wide band FM.	6
b	Explain the principle of direct method of generation of FM signal using relevant diagrams.	4
16.	Generate the narrow band and wide band FM With a neat block diagram.	10
	OR	
17	Draw the block diagram of FM demodulator and explain the effect of noise in detail and compare the performance of AM and FM in the presence of noise.	10
	OR	
18	Justify that the pre-emphasis and de-emphasis in FM is used to reduce the noise ,With a neat block diagram.	10
19	Draw the block diagram of a super heterodyne receiver and explain its operation? What are the advantages of this receiver?	10
	OR	
20	Generate a simple AGC circuit and what are the different types of AGC .	10