

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

April – May 2023		
(B.Tech) Program: Electronics and Telecommunication_Scheme I/II:_II		
Examination: SY Semester: IV		
Course Code: EXC404 and Course Name: Principles of Communication Engineering		
Date of Exam: 20-05-23	Duration: 2.5 Hours	Max. Marks: 60

Instructions:				
(1)All questions are compulsory.				
(2)Draw neat diagrams wherever applicable.				
(3)Assume suitable data, if necessary.				
		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Compare Wired and Wireless Channel	2	CO1	U
ii)	What is modulation? Explain the need of modulation.	2	CO2	R
iii)	How SSB is superior over DSB SC.	2	CO2	U
iv)	In FM systems, when the audio frequency is 400Hz and AF voltage is 4V, the deviation is 4.8 KHz. Calculate the modulation index and bandwidth required.	2	CO3	Ap
v)	Total transmitted power in FM always remains constant, Justify.	2	CO3	U
vi)	What is multiplexing? Give classification of Multiplexing	2	CO6	U
vii)	Define any two characteristics of a radio receiver.	2	CO4	R
viii)	Compare Natural Sampling and Flat top sampling	2	CO5	U
Q.2	Solve any four questions out of six.	16		
i)	Explain Channels in communication system	4	CO1	U
ii)	A modulating signal $m(t) = 10 \cos(2\pi 10^3 t)$ is amplitude modulated with a carrier signal $c(t) = 10 \cos(2\pi 10^5 t)$ Determine the modulation index, the carrier power, and the power required for transmitting AM wave.	4	CO2	AP

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iii)	Explain the principle and working of the reactance FM modulator.	4	CO3	U
iv)	Explain Practical diode detector with delayed AGC in detail	4	CO4	U
v)	Compare DM, ADM	4	CO 5	U
vi)	Explain TDM in detail.	4	CO6	U
Q.3	Solve any two questions out of three.	16		
i)	For a receiver with IF and RF frequencies of 455 KHz and 900 KHz respectively. Determine: The Local Oscillator frequency Image frequency Image rejection ratio for a pre-selector Q of 80	8	CO4	AP
ii)	Deduce FRIISS formula for calculation of total noise figure, if two amplifiers are connected in cascade.	8	CO1	AP
iii)	Explain PWM modulation and demodulation techniques	8	CO5	U
Q.4	Solve any two questions out of three.	16		
i)	Explain the DSB method using FET for suppression of unwanted carriers	8	CO2	U
ii)	With the help of a neat block diagram explain the principle and generation of indirect methods of FM generation.	8	CO3	U
iii)	Three signals having a data rate of 2kbps are grouped together by means of time division multiplexing. Each unit consists of 1 bit. Calculate 1. bit duration before multiplexing 2. transmission rate of TDM 3. duration of each time slot in TDM 4. Duration of TDM frame	8	CO6	Ap
