K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-22

(Autonomous College Affiliated to University of Mumbai)

End Semester Exam

May – June 2022

(B.Tech/M.Tech.) Program: Electronics and Telecommunication

Examination: SY Semester: IV

Course Code: 1UEXC404 and Course Name: **Principles of Communication Engineering**

Duration: 03 Hours   Max. Marks: 60

Instructions:

(1)All questions are compulsory.

(2)Draw neat diagrams wherever applicable.

(3)Assume suitable data, if necessary.

Q No.	Questions	Max. Marks	CO	BT level
Q 1	**Solve any six questions out of eight.**	**12**	-	-
i)	Total transmitted power in FM always remains constant, Justify.	2	CO2	U
ii)	What is Multiplexing? Explain its types?	2	CO6	R
iii)	What do you mean by heterodyning?	2	CO4	R
iv)	Define *direct PM* and *indirect PM*.	2	CO2	R
v)	Explain the term companding.	2	CO5	U
vi)	What are different types of modes of communication systems?	2	CO1	R
vii)	A 360 W carrier is simultaneously amplitude modulated by two audio waves with modulation percentages of 55 and 65 respectively. What is the total sideband power?	2	CO3	AP
viii)	Describe delta modulation	2	CO5	U
Q.2	**Solve any four questions out of six.**	**16**	-	-
i)	Explain the need for modulation?	4	CO2	U

ii)	Write short note on SNR, F, NF, NT	4	CO1	U
iii)	Draw and explain a superheterodyne receiver with waveforms at output of each stage.	4	CO3	U
iv)	Write short note on envelope detector	4	CO2	U
V)	Describe image frequency and image frequency rejection	4	CO4	U
Vi)	Compare PAM, PWM, PPM	4	CO5	U
Q.3	**Solve any two questions out of three.**	**16**		
i)	Describe the operation of a FET push-pull balanced modulator	8	CO2	U
ii)	Explain receiver parameters in details	8	CO4	U
iii)	**Prove** Sampling theorem for low pass band limited signal with spectrum	8	CO5	U
Q.4	**Solve any two questions out of three.**	**16**		
i)	A modulating Signal $20\sin(2\pi\times1000t)$ is used to modulate a carrier signal $80\sin(2\pi\times10000t)$ **Determine** 1. Vc, fc and Vm, fm 2. Modulation index(MI) & % MI 3. Side Band frequency and amplitude 4. The transmitted power 5. Draw frequency spectrum of modulated signal 6. BW 7. write AM expression	8	CO3	Ap
ii)	With suitable diagram, explain the working of the Basic FET reactance modulator	8	CO2	Ap
iii)	Explain PAM generation and detection in detail	8	CO5	Ap