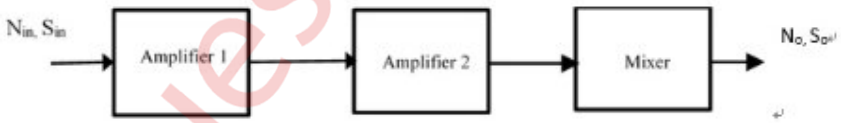
[Time: 3hrs] **[Total Marks:80]**

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

Q.1		Attempt any FOUR	**[20]**
	a	Compare PAM ,PWM and PPM	
	b	Define modulation. Explain the need of modulation in communication.	
	c	Compare narrowband and wideband FM.	
	d	What do you mean by aliasing error? How to overcome it?	
	e	Why is IF selected as 455 KHz in standard AM receivers?	
Q.2	a	Explain the working of diode detector with the help of neat diagram.	**[10]**
	b	Explain the PCM transmitter and receiver with the help of proper block diagram.	**[10]**
Q.3	a	Explain the working of Ratio detector with the relevant diagrams. How is it better than balanced slope detector?	**[10]**
	b	The AM transmitter generates a carrier power of 400 Watts for a carrier signal of 150 KHz. The carrier is modulated using modulation index of 0.5 by an audio signal of 5 KHz. Assume R=1Ω. i) Determine the total transmitted power ii) Determine the total sideband power iii) Power if DSBSC AM is transmitted iv) Draw the Power spectrum and find the bandwidth.	**[10]**
Q.4	a	Explain Armstrong method of FM generation. Why it is called as an Indirect method of FM generation?	**[10]**
	b	Define Friis formula. The figure shown below is front end of a receiver.	**[10]**



The noise factors and gains of individual system are as follows
Amplifier 1: G1= 5.85, F1= 12
Amplifier 2: G2= 11, F2= 15
Mixer: G3= 8.3, F3= 100
Calculate the overall noise figure of the system using Friis formula

Q.5	a	Explain the Pulse width modulation generation and detection with the help of waveforms.	**[10]**
	b	Compare AM and FM	**[5]**
	c	Define multiplexing. Explain the advantages of multiplexing.	**[5]**
Q.6	a	Explain the working of Superheterodyne receiver. How is it better than TRF receiver?	**[10]**
	b	Explain the Frequency division multiplexing in detail along with its applications.	**[10]**

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