[This question paper contains 2 printed pages.]

Sr. No. of Question Paper	:	6460	D	Your Roll No
Unique Paper Code	:	251503		
Name of the Course	:	B.Sc. (Hons.) Elec	etronics	
Name of the Paper	:	Analog Communica	tion (ELH	Г-502)
Semester	:	V		

Duration : 3 Hours

Maximum Marks: 75

## **Instructions for Candidates**

- 1. Write your Roll No. on the top immediately on receipt of this question paper.
- 2. Attempt five questions in all.
- 3. Question No. 1 is compulsory.
- 4. All questions carry equal marks.
- 1. (a) Where is the frequency band 300 kHz-3000 kHz of the electromagnetic spectrum used in communications ?
  - (b) Why is modulation necessary for transmission of signals?
  - (c) What is flywheel effect of a tuned circuit used in the generation of an AM wave? Explain giving the waveforms.
  - (d) What is the Carson's rule in FM?
  - (e) Define the terms sensitivity, selectivity and fidelity of a radio receiver.

 $(5 \times 3 = 15)$ 

- 2. (a) Explain the working of a high-level AM Transmitter. (7)
  - (b) Draw one cycle of an AM wave and calculate its modulation index in terms of Vmax and Vmin voltages. (4)
  - (c) What is an envelope detector ? Why is it called so ? (4)
- 3. (a) Draw the frequency spectrum of standard AM, DSBSC, SSB and SSBSC. (4)

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	(b)	Discuss the phase shift method of generating DSBSC signal, consisting the lower side band, with a neat block diagram.	ıg of (7)
	(c)	Why is VSB used in Television ?	(4)
4.	<b>(</b> a)	What are the limitations of direct method of FM generation ?	(4)
	(b)	Draw the complete block diagram of the Armstrong frequency modula system and explain the function of the mixer and multipliers. Under we circumstances can we dispense with the mixer ?	tion what (7)
	(c)	A carrier wave of 1 MHz frequency and amplitude of 3 Volts is freque modulated by a sinusoidal modulating signal frequency of 500 Hz an peak amplitude of 1 volt. The frequency deviation is 1 Khz. If the peak 1 of the modulating wave form is changed to 5V and the modulating freque is changed to 2 KHz, write the expression for the modulated wave in 1 the cases.	ency d of evel ency both (4)
5.	(a)	What is meant by the term "tracking error" in a super-heterod receiver?	lyne (4)
	(b)	Draw the block diagram of a double conversion receiver. When is the need for double conversion ?	ere a (7)
	(c)	In a super heterodyne receiver used for the reception of signals in broadcast band, among the incoming signal frequency and local oscill frequency, which is larger and why?	AM ator (4)
6.	(a)	Explain how a PLL can be used for FM demodulation.	(7)
	<b>(</b> b <b>)</b>	Discuss capture effect in FM receivers.	(4)
	(c)	How do pre-emphasis and de-emphasis provide extra noise immunit FM.	y in (4)
7.	(a)	Derive the transfer function of a High Pass Filter (using R and C) for condition RC << T, where T is the time period of the signal applied. square wave is applied at the input of such a filter, draw the output wavef and output spectrum.	the If a form (7)
	(b)	What is the difference between noise factor and noise figure?	(4)
	(c)	A tandem connection has three links each having a SNR of 60dB. Whe the overall SNR ?	at is (4)
		(1	800)

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