

TC - EXTC - Sem V - CBGS - Analog Communications

3Y5/18

(3 Hours)

Total Marks: 80

N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any three questions out of remaining five.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if required and mention the same in answer sheet.

Q.1 Solve any four

- Explain the need of modulation in communication system.
- Explain narrow band and wideband FM.
- What do you mean by double spotting in radio receiver.
- List the advantages and disadvantages of Digital communication.
- Write a note on aliasing error and aperture effect.

Q.2 (a) Explain the different types of noise in communication.

(b) Explain concept of AM wave with related equations. (10)

Q.3 (a) With the help of suitable diagrams explain generation and detection of PWM signal. (10)

(b) Draw and explain Delta modulation transmitter and receiver. (10)

Q.4 (a) Explain with block diagram and waveform AM Super-heterodyne radio receiver. (10)

(b) What is multiplexing? Explain FDM in detail. (10)

Q.5 (a) What are different methods of FM generation? Draw circuit diagram and explain the principle of reactance modulator? (10)

(b) Explain VSB transmission with its applications. (10)

Q.6 Write a Short notes on (Solve any Four) (20)

- Generation and detection of PPM
- Phase shift method of AM generation (SSB)
- Applications of FM
- Sampling Techniques
- Delayed AGC

TE-EXIC - Sem V - CBGS - Integrated Circuits
Q.P. Code: 23103

06/06/18

(3 Hours)

[Total Marks: 80]

- N.B.: (1) Question No. 1 is compulsory.
 (2) Solve any three questions from the remaining five.
 (3) Figures to the right indicate full marks.
 (4) Assume suitable data if necessary and mention the same in answer sheet.

Q.1

Attempt any 4 questions:

- (A) How does precision rectifier differ from conventional rectifier? [20]
 (B) If the input to the ideal comparator shown in the Fig. 1(B) is a sinusoidal signal of 8 volt peak to peak without any DC component, then check whether the duty cycle of the output of comparator is 33.33% or 25% or 20%. Prove it.

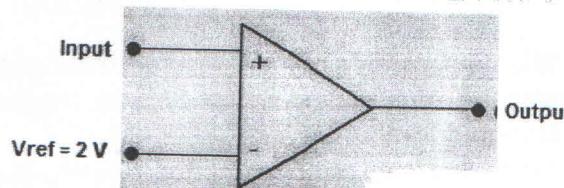


Fig. 1(B)

- (C) With neat circuit diagram derive an expression for output current of a voltage to current converter with floating load.
 (D) With the help of a neat circuit diagram explain any one application of PLL 565.
 (E) What is CMRR? How to measure it practically?

Q.2

- (A) Draw the circuit diagram of a square and triangular waveform generator using opamps and explain its working with the help of waveforms. For variation in duty cycle what is the modification needed in the circuit. [10]

- (B) With the help of a functional block diagram explain the working of voltage regulator LM317 to give an output voltage variable from 5 V to 10 V to handle maximum load current of 500 mA. [10]

Q.3

- (A) Draw a neat circuit diagram of a Wein bridge oscillator using opamp. Derive its frequency of oscillation. What are the values of R and C if its frequency of oscillation is 1 kHz? [10]

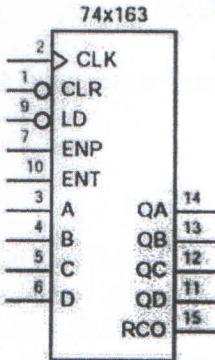
- (B) Design a voltage regulator using IC 723 to give $V_o = 3$ V to 37 V and output current of 2 A. [10]

Q.4

- (A) Design a second order Butterworth high pass filter for cut off frequency of 1 kHz and pass-band gain of AF=2. [10]

P.T.O.

- (B) Design a counter for counting a sequence 3, 4, 5, 6...12, 3... using IC MSI 74163. The pin terminology and functionality of IC MSI 74163 is given in Fig. 4(B).



	Inputs				Current State				Next State			
	CLR	LD	ENT	ENP	QD	OC	QB	QA	QD*	OC*	QB*	QA*
clear	0	x	x	x	x	x	x	x	0	0	0	0
load	1	0	x	x	x	x	x	x	D	C	B	A
hold	1	1	0	x	x	x	x	x	QD	QC	QB	QA
hold	1	1	x	0	x	x	x	x	QD	QC	QB	QA
	1	1	1	1	0	0	0	0	0	0	0	1
	1	1	1	1	0	0	0	1	0	0	1	0
	1	1	1	1	0	0	1	0	0	0	1	1
	1	1	1	1	0	0	1	1	0	1	0	0
	1	1	1	1	0	1	0	0	0	1	0	1

Fig. 4(B)

- Q.5 (A) With the help of a neat diagram and voltage transfer characteristics explain the working of a non-inverting Schmitt trigger. Derive the expressions for its threshold levels. [10]
- (B) Draw and explain the functional block diagram of IC 555 and explain its operation in monostable mode. Draw its various waveforms. [10]
- Q.6 (A) Write short notes on: (Attempt any two) [20]
 Voltage to frequency converter.
 IC 74181 Arithmetic Logic Unit.
 Waveform generator XR 2206.