

**University of Mumbai**  
**Examination Second Half 2021 under cluster 06**  
**(Lead College: Vidyavardhini's College of Engg Tech)**  
**Examinations Commencing from 22<sup>nd</sup> November 2021 to 5<sup>th</sup> January 2022**

Program: **Electronics Engineering**

Curriculum Scheme: Rev2019

Examination: TE Semester: V

Course Code: ELC503 and Course Name: Linear Integrated Circuits

Time: 2 hour 30 minutes

Max. Marks: 80

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<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Which among the following can be used to detect the missing pulse detector
Option A:	Astable multivibrator
Option B:	Comparator
Option C:	Bistable multivibrator
Option D:	Monostable multivibrator
2.	Which of the following are main circuits of voltage to frequency converter?
Option A:	differentiator and comparator
Option B:	integrator and Schmitt trigger
Option C:	S/H circuit and Schmitt trigger
Option D:	differentiator and S/H circuit
3.	The lower and higher cut-off frequency of BPF is 3.5 KHz and 10 KHz respectively. Determine its bandwidth.
Option A:	65000 Hz
Option B:	6500 Hz
Option C:	650 Hz
Option D:	65 Hz
4.	To a Schmitt trigger in non inverting configuration, an input triangular wave of 1 V <sub>p-p</sub> is applied. What will be the output waveform if upper and lower threshold voltages are 0.25 V?
Option A:	sawtooth waveform
Option B:	sine waveform
Option C:	square waveform
Option D:	pulse waveform
5.	Calculate the analog output voltage of 4 bit DAC , if the digital input is "1011". Assume full scale voltage is 5 V.
Option A:	3.43 V
Option B:	5 V
Option C:	4.5 V
Option D:	8 V

6.	In wein bridge oscillator if $R=3.3\text{ K}\Omega$ and $C=0.05\mu\text{F}$ is used. What should be an oscillating frequency?
Option A:	100 Hz
Option B:	965 Hz
Option C:	394 Hz
Option D:	25 Hz
7.	What does the discharge transistor do in the 555 timer circuit?
Option A:	Charge the external capacitor to stop the timing
Option B:	Charge the external capacitor to start the timing over again
Option C:	Discharge the external capacitor to stop the timing
Option D:	Discharge the external capacitor to start the timing over again
8.	A square wave oscillator has $f_o = 1\text{KHz}$ . Assume the resistor value to be $10\text{K}\Omega$ and find the capacitor value?
Option A:	$3.9\ \mu\text{F}$
Option B:	$0.3\ \mu\text{F}$
Option C:	$2\ \mu\text{F}$
Option D:	$0.05\mu\text{F}$
9.	Which of the following is not a method of DAC
Option A:	Weighted resistor method
Option B:	R-2R ladder
Option C:	Inverted R-2R-ladder method
Option D:	Flash type
10.	RC phase shift oscillator is _____ oscillator
Option A:	Low frequency
Option B:	High frequency
Option C:	Ultra high frequency
Option D:	Super high frequency

<b>Q2.</b> <b>(20 Marks)</b>	
A	<b>Solve any one</b> <b>10 marks each</b>
i.	Explain functional block diagram of IC 555 timer
ii.	Explain 78XX series Voltage Regulators
B	<b>Solve any One</b> <b>10 marks each</b>
i.	Design HPF with cut off frequency of 1KHz with passband gain of 2.
ii.	Explain ideal integrator and practical integrator circuit?

<b>Q3.</b> <b>(20 Marks)</b>	
A	<b>Solve any one</b> <b>10 marks each</b>
i.	What is Precision rectifier? Explain half wave rectifier circuit.
ii.	Derive the expression for voltage gain of noninverting amplifier and design the same for gain of 20.
B	<b>Solve any One</b> <b>10 marks each</b>

i.	Derive the expression of frequency of oscillation for the wein bridge oscillator
ii.	Explain the circuit of 3 op-amp Instrumentation amplifier

<b>Q4. (20 Marks)</b>	
A	<b>Solve any One 10 marks each</b>
i.	Explain Basic Block diagram of OP-AMP
ii.	Draw waveforms and explain inverting comparator and non inverting comparator circuit with positive and negative reference voltages
B	<b>Solve any One 10 marks each</b>
i.	Explain waveform generator circuit.
ii.	Explain working of phase lock loop.