

University of Mumbai

Examination 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: TE Semester V

Course Code: ELX504 and Course Name: Design with Linear Integrated Circuits

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The average of the currents that flow into the inverting and non- inverting input terminals of op-amp is called as
Option A:	Input offset current
Option B:	Output current
Option C:	Input bias current
Option D:	Offset voltage
2.	3v, 5v and 7v are the three-input voltage applied to the inverting input terminal of averaging amplifier. Determine the output voltage?
Option A:	-5
Option B:	-10
Option C:	-15
Option D:	-20
3.	The IC 7905 voltage regulator provides _____
Option A:	5V
Option B:	-5V
Option C:	12V
Option D:	10V
4.	The on time (T_{on}) of monostable multivibrator using IC555 is _____
Option A:	1.1RC
Option B:	2RC
Option C:	5RC
Option D:	RC
5.	An astable multivibrator requires _____
Option A:	balanced time constants
Option B:	a pair of matched transistors
Option C:	no input signal
Option D:	dual J-K flip-flops
6.	Which is not considered as a linear voltage regulator?
Option A:	Fixed output voltage regulator
Option B:	Adjustable output voltage regulator
Option C:	Switching regulator
Option D:	Special regulator
7.	In a monostable multivibrator using 555 timer for a pulse period of _____ with $R=8.2K\Omega$ and $C= 0.1\mu f$.

Option A:	1ms
Option B:	10ms
Option C:	2ms
Option D:	5ms
8.	The maximum current obtainable from IC 723 is
Option A:	150mA
Option B:	1A
Option C:	1.5A
Option D:	250mA
9.	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
10.	In a series regulator, what is the purpose of fold-back limiting?
Option A:	to provide more current in the case of a short circuit
Option B:	to limit output voltage if input voltage goes too high
Option C:	to bypass the pass-transistor, if the pass-transistor should fail
Option D:	to provide current up to a maximum, but drop current to a lower value when the output becomes shorted, to prevent overheating of the device
11.	The monostable multivibrator circuit is not an oscillator because
Option A:	its output switches between two states
Option B:	it requires a sine wave input signal
Option C:	it requires a trigger to obtain an output signal
Option D:	the circuit does not require a dc power supply
12.	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
13.	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
14.	Which among the following performance parameters is called the change in line voltage within a specified range at a constant load current?
Option A:	Line regulation
Option B:	Load regulation
Option C:	Temperature stability factor
Option D:	Ripple factor
15.	For opamp in the common mode,
Option A:	both inputs are grounded
Option B:	the outputs are connected together
Option C:	an identical signal appears on both the inputs
Option D:	the output signals are in-phase

16.	If the input to a comparator is a sine wave, the output is a----
Option A:	Ramp Voltage
Option B:	Sine wave
Option C:	Sawtooth wave
Option D:	Rectangular wave
17.	For an opamp, if $AD = 3500$ and $AC = 0.35$, the CMRR is
Option A:	80dB
Option B:	100dB
Option C:	60dB
Option D:	120dB
18.	A third-order filter will have a roll-off rate of
Option A:	-20 dB/decade.
Option B:	-40 dB/decade.
Option C:	-60 dB/decade.
Option D:	-30 dB/decade.
19.	Zero crossing detectors is also called as
Option A:	Square to sine wave generator
Option B:	Sine to square wave generator
Option C:	Sine to triangular wave generator
Option D:	Sine to sawtooth wave generator
20.	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

Q2.	Solve any Two Questions out of Three 10 marks each
A	Design second order high pass filter using OPAMP at $f_0= 1\text{KHZ}$ and with gain at 2.
B	Design triangular wave generator using opamp to have output voltage = 7VPP volts, frequency 2 kHz, with supply voltage $\pm 14\text{ V}$
C	Design a IC 555 based symmetrical square wave generator for 1 KHz frequency of $V_{CC}=5\text{V}$. draw waveforms for voltage across timing capacitor and output.

Q3.	Solve any Two Questions out of Three 10 marks each
A	Draw and explain functional block diagram, working of IC 723.
B	What are the features of instrumentation amplifier, draw neat diagram of three op-amp instrumentation amplifier and hence derive equation of output voltage.
C	Design RC phase shift oscillator to produce sinusoidal output of 5 KHz.