SARDAR PATEL UNIVERSITY

T.Y.B.Sc. (Electronics & Communication) (Sem. - VI) Examination
Day & Date: Saturday, 31/03/2018
Time: 10:00 a.m. To 1:00 p.m.
Subject Code: US06CELC03
Subject: Operational Amplifier & its Applications

Instructions:

(a) *Figure to the right indicates full marks.*

(b) *All questions are compulsory.*   **Total Marks: 70**

Q-1		Choose the correct answer.			(10)
	1.	_____ is defined as Op-amp output voltage when both the input terminal voltages of the Op-amp are grounded.			
		(a)	O/P offset voltage	(b)	I/P offset voltage
		(c)	I/P bias current	(d)	O/P offset current
	2.	_____ amplifier is a circuit whose output is amplified version of difference between two input voltages.			
		(a)	Difference	(b)	Inverting
		(c)	Non-inverting	(d)	Summing
	3.	In Inverting amplifier the input is given to inverting terminal so that the output is _____ with respect to input.			
		(a)	90^0 out of phase	(b)	180^0 out of phase
		(c)	270^0 out of phase	(d)	same
	4.	The voltage gain (AV_0) for first order Butterworth High pass filter is _____.			
		(a)	1.56	(b)	0.707
		(c)	0.56	(d)	0.3
	5.	The maximum rate of change of output voltage under large signal condition is called as _____.			
		(a)	Slew rate	(b)	I/P bias current
		(c)	O/P offset current	(d)	I/P offset voltage
	6.	_____ is a device that converts change in physical quantity in to corresponding electrical quantity.			
		(a)	Transducer	(b)	Capacitor
		(c)	Resistor	(d)	All of these
	7.	The first order low pass filter circuit uses a RC network for filtering is used _____ Configuration.			
		(a)	Inverting	(b)	Non Inverting
		(c)	Both (a) & (b)	(d)	None of above
	8.	_____ is a system that converts a digital signal into an analog signal.			
		(a)	D to A converter	(b)	Sample and hold circuit
		(c)	A to D converter	(d)	none
	9.	The most popular D/A Converter _____.			
		(a)	Successive approximation	(b)	Weighted resistor
		(c)	Switched capacitor	(d)	R – 2R ladder
	10.	Among these which is the fastest type of the ADC?			
		(a)	Dual Slope type	(b)	Counter type
		(c)	Flash type	(d)	Tracking type
					P.T.O
Q-2		Answer the following questions. (Any Ten)			(20)
	1.	Define the following terms : (i) Thermal drift (ii) input bias current			
	2.	Define the following terms : (i) Common mode rejection ratio (ii) input offset voltage			

3.	Draw the pin out diagram of IC741.	
4.	Draw the circuit diagram of inverting amplifier.	
5.	What is the difference between Inverting & Non Inverting amplifiers?	
6.	Define: Accuracy.	
7.	Is the output of DAC are true analogy? Give reason.	
8.	Draw the circuit diagram Anti LOG amplifier.	
9.	What are the advantages of Active filter over Passive Filter?	
10.	Give the advantage of R-2R ladder type over weighted type DAC.	
11.	Give the specification of D TO A converter.	
12.	What do you meant by signal conversion?	
(a)	List out the requirement for designing Instrumentation amplifier. Discuss the Instrumentation amplifier and also derive the expression for overall gain in I.A.	(10)
	OR	
(a)	Explain Non-inverting Amplifier in detail.	(05)
(b)	With the help of the necessary circuit diagram and equation explain summing amplifier.	(05)
(a)	Explain the Differentiator Amplifier in detail.	(05)
(b)	Explain Non-linear Op-Amp in detail.	(05)
	OR	
(a)	Explain Integrator Amplifier in detail.	(05)
(b)	Discuss the basic LOG Amplifier.	(05)
(a)	What is Filter? Differentiate between Active and Passive filters. Draw the ideal filter characteristics of all filters.	(10)
	OR	
(a)	Design the first order Butterworth high Pass Filter also derive the expression for cut off frequency.	(05)
(b)	Design the Second order Butterworth high Pass Filter also derive the expression for cut off frequency.	(05)
(a)	Explain R – 2R Ladder type D/A Converter and also calculate the output voltage for input 1000 & 0100.	(05)
(b)	With necessary circuit diagram explain Counter type ADC.	(05)
	OR	
(a)	Give the complete detail on Tracking type A/D converter.	(05)
(b)	Explain Voltage to frequency conversion.	(05)