Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: IV (EC) Engineering

Regular Examination April – June 2016

2EC403: Analog Electronics

Time: 3 Hours **Total Marks: 60**

Instruction:

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION-I

1	(A)	Derive expression for transfer gain of amplifier with positive and negative feedback.	5
	(B)	Explain different type of basic amplifier.	5
		OR	
1	(A)	The amplifier has a bandwidth of 150KHz and voltage gain of 50. What will be the bandwidth and gain if amplifier has 5% negative feedback?	2
	(B)	A single stage transistor amplifier has a voltage gain of 600 without feedback, and 50 with feedback. Calculate the percentage of output which is feedback to input.	2
	(C)	Find input and Output resistance of Voltage series feedback amplifier.	6
2	(A)	Explain different types of multivibrators with waveform. Also write the application of its.	4
	(B)	What is load and line regulation in voltage regulator? Write equation for them.	3
	(C)	Explain working principle of oscillator.	3
		OR	
2	(A)	Using block diagram explain the working principle of series voltage regulator.	5
	(B)	Draw functional block diagram of IC 555 timer and explain function of each pin.	5
3	(A)	Explain working of astable multivibrator design using timer IC-555. Write the T_{on}, T_{off} and duty cycle equation.	5
	(B)	Explain the principle of operation of Wien bridge oscillator and give the condition for sustained oscillation.	5

SECTION-II

4	(A)	Explain in brief following Op-Amp related parameters: 1. Gain-Bandwidth product 2. Channel separation	4
	(B)	Draw and explain block diagram of typical op-amp.	4
	(C)	Discuss pin identification of 741 IC.	2
		OR	
4	(A)	Explain in brief following Op-Amp related parameters: 1. Output short circuit current 2. Differential input resistance 3. Input capacitance 4. Input offset current	4
	(B)	Draw the circuit of voltage follower and for the 741C connected as voltage follower with R_1 =1 kΩ, R_F =10 kΩ, A=2×10^5, R_i=33 MΩ, R_o=75 Ω, f_0=5Hz, Supply voltage = ±15V, Max. Output voltage swing = ±13V, Calculate A_F, R_{iF}, R_{oF}, f_F, and V_{OOT}.	6

5 (A) Derive equation for A_F, R_{iF} and R_{oF} for OP-AMP inverting amplifier with feedback. 5

(B) Find A_F, R_{iF} and R_{oF}, f_F, and V_{OOT} for 714C OP-AMP non-inverting amplifier circuit with $A=4\times10^5$, R1=470 Ω, Ri=33 MΩ, R_F =4.7 KΩ, R_o=60 Ω, UGB= 0.6 MHz, Supply voltage= ±15V, Max. Output voltage swing=±13V 5

OR

5 (A) Explain differential amplifier with single op-amp and prove that voltage gain of it, is same as that of inverting amplifier. 5

(B) Explain summing, scaling and averaging amplifier in inverting configuration. 5

6 (A) Design a first order low pass filter so that it has a cutoff frequency of 2 kHz and passband gain of 1. Also using frequency scaling technique, convert 2 KHz cutoff frequency to new cut off frequency of 1.2 KHz. 4

(B) Draw the circuit of schmitt trigger circuit with hysteresis loop. 2

(C) Draw and explain integrator circuit with op-amp. 4

END OF PAPER