

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

Summer Examination 2020

HVPM's College of Engineering and Technology, Amravati

Department of Electronics & Telecommunication Engineering

Bachelor of Engineering Sem :- V

Subject : Analog Electronics II

Code: 5ET1

Instructions:

- 1) Solve any two questions
- 2) All questions carry equal marks

Que. 1		
a	Explain working of IC LM723 voltage regulator circuit.	2 credit point
b	Design differential amplifier to subtract 10 times the voltage at input A from 5 times the voltage from B make $R_f = R_{OM} = 100K\Omega$.	2 credit point
c	Design a circuit that changes a output state at 30 and 210 of the phase instant of applied input to a sinusoidal waveform. The RMS value of input is 5V and reptation rate is 50 sec. the output of the circuit is required with min positive component.	2 credit point
d	Design divide by 2 network using the monostable multivibrator. If the frequency of the input trigger signal is 2KHz. Draw the input and output waveform.	2 credit point
e	Design 1 st order LPF with higher cut off frequency of 5KHz using IC 741c.	1 credit point
f	Design instrumentation amplifier to meet the following specification 1) Switchable gain 3,5 and 10 2) Very high CMRR 3) Very High Input Impedance	1 credit point
Que. 2		
a	Explain working of Adjustable LM 317 voltage regulator circuit.	2 credit point
b	Design a circuit to sum up three signals multiplied by a scaling factor of a 741c with $\pm 15V$ supply.	2 credit point
c	Design window detector using 741c to have following specification when 1) $V_{in} \geq 4V$ output V_o should high 2) when $V_{in} \leq 2V$, output V_o is high 3) when $2V < V_{in} < 4V$, V_o is low. Used power supply $\pm 15V$.	2 credit point
d	Design a PLL using IC 565 for VCO output frequency of 3KHz. Also calculate lock range and capture range use $V_{cc} = 10V$	2 credit point
e	Design 2 nd order LPF with higher cut off frequency of 2KHz.	1 credit point
f	Design the instrumentation amplifier to have the variable gain from 1 to 5.	1 credit point
Que. 3		
a	Design transistorised series voltage regulator to fulfil the given specification. The specifications are $V_i = 20$ to $30V$, $V_o = 15V$, $i_l = 1$ amp, calculate S_v and R_o .	2 credit point
b	Design summing amplifier to have the output voltage $V_o = 5.2 V_1 + 3.4 V_2 - 6.9 V_3 - 9.3V_4$	2 credit point
c	Design square wave generator using IC 741c for output frequency = 1KHz. Use power supply $V_{cc} = \pm 15V$.	2 credit point

d	Design an astable multivibrator which will flash the electric bulb such that its ON time will be 3 sec and off time will be 1 sec.	2 credit point
e	Design 1 st order HPF with following specifications: gain = 10 with $f_l = 100\text{Hz}$. Keeping the pass band gain same. Find new value of resistance R such that $f_l = 200\text{Hz}$.	1 credit point
f	Design an instrumentation amplifier to meet the following specification 1) Very high input impedance 2) Slew rate = $0.5 \text{ V}/\mu\text{sec}$ 3) Unity gain bandwidth = 1 MHz. 4) Bandwidth of amplifier = 100KHz 5) $V_{out} = \pm 12\text{V}$	1 credit point
Que. 4		
a	Design regulated power supply to meet the following specification $V_i = 45 \pm 5\text{V}$ with $R_o = 10\Omega$, $V_o = 30 \text{ V}$ at 1 amp. Stability factor should be less than 0.1. also compute change in output voltage ΔV_o due to input voltage change $\pm 5\text{V}$ and load variation 0 to 1amp.	2 credit point
b	Design differentiator circuit using op-amp that varies the input signal with respect to frequency of 10 Hz to 1KHz.	2 credit point
c	Design triangular wave generator for output frequency of 1KHz. Use 741c with $\pm 15\text{V}$ Supply.	2 credit point
d	Design 555 based square wave generator to produce a symmetrical square wave of 2KHz. If $V_{CC} = 12\text{V}$, draw the voltage across timing capacitor and the output.	2 credit point
e	Design 2 nd order HPF to have the lower cut off frequency = 100Hz.	1 credit point
f	Design an instrumentation amplifier for following specification 1) Voltage gain = 40dB 2) Very high input impedance	1 credit point