2019

B.Sc.

4th Semester Examination

# ELECTRONICS (Honours)

## Paper - C8P

## (Operational Amplifiers and Application Lab)

## [Practical]

Full Marks : 20 Time : 3 Hours

*The figures in the margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable.*

Answer any *one* questions selecting it by a lucky draw.

1. Use the given OP-AMP as an inverting amplifiers with one suitable gain. Use atleast four input voltages (positive and negative). Record and nullify off-set voltage, if any. Draw the input voltage vs output voltage graph. Hence find the closed-loop gain.

2. Use the given OP-AMP as a non-inverting amplifier with one suitable gain. Use atleast four input voltages

(positive and negative). Record and nullify offset voltage, if any. Draw the input voltage vs. output voltage graph. Hences find the closed loop gain.

3. Use the given OP-AMP as an adder with are suitable gain. Apply three input voltages (positive and negative). Take atleast six different combination of input voltages. Compare the expected and experimental output voltages.

4. Design a non-inverting amplifier of gain 10 using an OP-AMP. Draw the input-output graph.

5. Use the given OP-AMP to act as a subtractor. Take atleast six different combination of input voltages. Compare the expected and experimental output voltages.

6. Study the characteristics of any given OPAMP. Calculate the CMRR and slew rate for the given OPAMP.

7. Design an active lowpass filter with any cut-off frequency and any pass-band gain in connection with the filter using an OPAMP and a R-C network. Plot the frequency response curve of the filter. Find the cut off frequency.

8. Design an active highpass filter with cutoff frequency ..... kHz and pass band gain ..... gain OPAMP and

a R-C network. Plot the frequency response curve of the filter. Find the cut-off frequency.

9. Design a fixed voltage power supply using IC regulators of 78 series and study its performance :

   Output Voltage : ..... V

   Output Current : ..... mA

   Draw the graph.

10. Design an astable multivibrator circuit with frequency 2 kHz and duty cycle 75%. Using 1C 555 on breadboard. Plot the output voltage vs. time curve and verify the output frequency and duty cycle from the plot with the given values.

11. Design an integrator circuit using OP-AMP taking input resistance $R_1 = 1\,k\Omega$, feedback resistor $R_2 = 6.8\,k\Omega$, feedback capacitor $C_2 = 0.1\,\mu F$ and load resistance $R_3 = 16\,k\Omega$ on a breadboard. Record the result and plot the frequency response of the output voltage for a suitable input voltage.

12. Design a differentiator circuit using OP-AMP with calculated discrete comparents as any choice on a breadboard. Record the result and plot the frequency

response of the output voltage for a suitable input voltage.

**Distribution of Marks**

| | | |
|---|---|---|
| Experiment | — | 15 |
| LNB | — | 02 |
| Viva-voce | — | 03 |
| Total | | 20 |