

**DIPLOMA - VIEP - ELECTRONICS AND
COMMUNICATION ENGINEERING (DECVI)**

Term-End Examination

00534

June, 2017

BIEL-038 : LINEAR INTEGRATED CIRCUITS

Time : 2 hours

Maximum Marks : 70

Note : Attempt any **five** questions. Question no. **1** is **compulsory**. All questions carry equal marks. Missing data may be assumed suitably.

1. Choose the correct answer for the following : $7 \times 2 = 14$

(a) An IC has _____ size.

- (i) very large
- (ii) large
- (iii) extremely small
- (iv) None of the above

- (b) An Operational amplifier is used as
- (i) Linear IC
 - (ii) Digital IC
 - (iii) Both (i) and (ii)
 - (iv) None of the above
- (c) Op-Amp stands for
- (i) Optimum amplifier
 - (ii) Operational ampere
 - (iii) Operational amplifier
 - (iv) None of the above
- (d) An astable multivibrator requires
- (i) balanced time constants
 - (ii) a pair of matched transistors
 - (iii) no input signal
 - (iv) dual J-K flip-flop
- (e) A _____ filter rejects all frequencies within a specified band and passes them outside this band.
- (i) low pass
 - (ii) high pass
 - (iii) band pass
 - (iv) band stop

(f) The gain of an inverting amplifier is given as

(i) $\frac{R_f}{R_i}$

(ii) $-\frac{R_i}{R_F}$

(iii) $-\frac{R_F}{R_i}$

(iv) $\frac{R_i}{R_i + R_F}$

(g) Which of the following is **not** a linear/digital IC ?

(i) Phase-locked loop

(ii) Voltage controlled oscillator

(iii) Passive filter

(iv) Comparator

2. Explain the inverting and non-inverting configuration of adders like summing, scaling and average amplifier using Op-Amp. 14

3. (a) Explain the concept of virtual ground and draw the integrator circuit using Op-Amp. 7

(b) Calculate the output voltage of an inverting and non-inverting amplifier for values of $V_1 = 2 \text{ V}$, $R_f = 500 \text{ k}\Omega$ and $R_i = 100 \text{ k}\Omega$. 7

4. Draw and explain a sample and hold circuit. 14
5. (a) What is a filter ? Classify it. 7
(b) Draw the circuit diagram of band-pass and high-pass filters. 7
6. Explain the operation of IC-555 as monostable and astable multivibrators and support your explanations with the expression and output waveforms. 14
7. Write short notes on any *two* of the following : $2 \times 7 = 14$
- (a) Instrumentation Amplifier
(b) Schmitt Trigger
(c) Voltage Controlled Oscillator