

SARDAR PATEL UNIVERSITY**BSc (VI Sem.) Examination****Monday, 8 April 2013****3 - 6 pm****Electronics****US06CELE01 - Discrete and Linear Circuits II****Total Marks: 70****Note:** Figures to the right indicate marks.

Q.1 Multiple choice Questions:

[10]

- (1) Slew rate is defined as the _____.
 - (i) Maximum rate of change of o/p voltage with time
 - (ii) Minimum rate of change of o/p voltage with time
 - (iii) Moderate rate of change of o/p voltage with time
- (2) Common mode gain signifies _____.
 - (i) Increase the noise
 - (ii) The ability to reject the common mode signal
 - (iii) Increase the distortion
- (3) Op. Amp Integrator uses _____ as a feedback element.
 - (i) Resistor
 - (ii) Capacitor
 - (iii) Inductor
- (4) The voltage out of the Schmitt trigger is _____.
 - (i) A high voltage
 - (ii) A low voltage
 - (iii) Either high or low voltage
- (5) The output of relaxation oscillator is a _____.
 - (i) Sine Wave
 - (ii) Square Wave
 - (iii) Spike
- (6) A log amplifier has an _____ in the feedback loop.
 - (i) Diode
 - (ii) Either diode or BJT
 - (iii) BJT
- (7) What part of characteristics curve of a diode is useful for log amplifier?
 - (i) Log region between 0v and 0.7v
 - (ii) Log region above 0.7v
 - (iii) Log region below 0.7v
- (8) The 555 timer IC is designed to operate in the temperature range of _____.
 - (i) -55° C to +125° C
 - (ii) 0° C to 125° C
 - (iii) 55° C to 125° C
- (9) In 555 timer IC, astable mode produces _____ waveform at the output.
 - (i) Square Wave
 - (ii) Rectangle Wave
 - (iii) Sine Wave
- (10) The range of frequency over which PLL acquires phase lock with applied input signal is called _____.
 - (i) Capture State
 - (ii) Free-running State
 - (iii) Lock State

- Q.2 Answer **any ten** in brief: [20]
- (1) Give the ideal characteristics of an Op Amp.
 - (2) State the advantage of active filter over passive filter.
 - (3) What is meant by dc parameters? Mention the various types of dc parameters.
 - (4) State the principle of precision rectifier.
 - (5) Mention the disadvantage of open loop comparator.
 - (6) Draw the circuit of monostable multivibrator using op Amp.
 - (7) Draw the circuit of charge amplifier and briefly explain it.
 - (8) Draw the block diagram of analog voltage multiplier and give the expression of output voltage.
 - (9) Draw the basic Log amplifier circuit using diode and give its short-coming.
 - (10) Draw the functional block diagram of PLL.
 - (11) Give the salient features of 555 timer IC.
 - (12) Draw the pin diagram of IC 555 and give the function of each pin.

- Q.3
- (a) Explain how the inverting amplifier can be used as a summer. [04]
 - (b) Explain how op-Amp can be used as a difference amplifier and subtractor. [06]

OR

- Q.3
- (a) Draw the circuit diagram of an ideal differentiator. What are its short comings? [06]
 - (b) Explain the first order Butterworth low pass filter. [04]

- Q.4
- (a) Draw the circuit diagram of sample and hold circuit and explain its working. [06]
 - (b) Define precision rectifier. Give the circuit diagram of full wave precision rectifier. [04]

OR

- Q.4
- (a) Draw the circuit diagram of an astable multivibrator and explain its working. [06]
 - (b) Draw the circuit of voltage controlled oscillator and explain its working. [04]

- Q.5
- (a) Discuss in detail the temperature compensated Log amplifier. [06]
 - (b) Write a note on frequency to Voltage Converter. [04]

OR

- Q.5
- (a) Write a note on temperature to voltage converter. [04]
 - (b) Discuss in detail The Analog Amplifier. [06]

- Q.6
- (a) Discuss how astable multivibrator can be used as a Linear Ramp generator. [05]
 - (b) Discuss how astable multivibrator can be used as a FSK generator. [05]

OR

- Q.6
- (a) Discuss how monostable multivibrator can be used as a missing pulse detector. [05]
 - (b) Draw the functional block diagram of PLL and discuss the three different states of PLL. [05]

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