b.i. Explain the working of function generator using 8038 IC. (8 Marks)

ii. Explain the operation of opto coupler. (4 Marks)

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Reg. No.														

B.Tech. DEGREE EXAMINATION, NOVEMBER 2018
Fourth Semester

EE1014 – LINEAR INTEGRATED CIRCUITS
(For the candidates admitted during the academic year 2013 – 2014 and 2014 -2015)

Note:
(i) **Part - A** should be answered in OMR sheet within first 45 minutes and OMR sheet should be handed over to hall invigilator at the end of 45th minute.
(ii) **Part - B** and **Part - C** should be answered in answer booklet.

Time: Three Hours Max. Marks: 100

PART – A (20 × 1 = 20 Marks)
Answer **ALL** Questions

1. What is the purpose of differential amplifier stage in internal circuit of an Op-Amp?
   (A) Low gain to differential mode signal (B) Cancel difference mode signal
   (C) Low gain to common mode signal (D) Cancel common mode signal

2. A non-inverting closed loop Op-Amp circuit generally has a gain factor
   (A) Less than 1 (B) Greater than 1
   (C) Zero (D) Equal to 1

3. An ideal Op-Amp requires infinite bandwidth because
   (A) Signals can be amplified without attenuation (B) Output common mode noise voltage is zero
   (C) Output voltage occurs simultaneously with input voltage changes (D) Output can drive infinite number of device

4. Find the output voltage of an ideal Op-Amp, if V_1 *and* V_2 are the two input voltages?
   (A) $V_0 = V_1 - V_2$ (B) $V_0 = A(V_1 - V_2)$
   (C) $V_0 = A(V_1 + V_2)$ (D) $V_0 = V_1 * V_2$

5. Another name of unity gain amplifier is
   (A) Difference amplifier (B) Comparator
   (C) Single ended amplifier (D) Voltage follower

6. Sine wave generator uses _____.
   (A) Negative feedback (B) Positive feedback
   (C) No feedback (D) Both positive and negative feedback

7. Which of the following is not a linear/digital IC?
   (A) Phase locked loop (B) Voltage controlled oscillator
   (C) Passive filter (D) Comparator

8. A log amplifier may use the _____ junction of a BJT in feedback loop.
   (A) Base-collector (B) Base-emitter
   (C) Emitter-collector (D) Emitter-ground

9. A zero level detector is
   (A) Comparator with a sinewave output
   (B) Comparator with a trip point referenced to zero
   (C) Peak detector
   (D) Limiter

10. If bandwidth of a filter increases, the
   (A) Centre frequency decreases
   (B) Q decreases
   (C) Roll off rates increases
   (D) Ripples appear in stop band

11. The central frequency is defined as the point at which the response drops from the pass band
   (A) –20 dB
   (B) –6 dB
   (C) –40 dB
   (D) –3 dB

12. A PLL maintains lock by comparing
   (A) The phase of two signals
   (B) The frequency of two signals
   (C) Amplitude of two signals
   (D) Phase and amplitude of two signals

13. A digital to analog converter is an application of the
   (A) Scaling adder
   (B) Voltage to current converter
   (C) Non inverting amplifier
   (D) Adjustable bandwidth circuit

14. Find out the resolution of 8 bit DAC/ADC?
   (A) 562
   (B) 625
   (C) 256
   (D) 265

15. In which application dual slop converter are used?
   (A) Thermocouple
   (B) Digital panel meter
   (C) Weighting scale
   (D) Monitoring system

16. How many terminals does a 78XX series IC regulators have?
   (A) 2
   (B) 3
   (C) 4
   (D) 6

17. Which of the following have distorted sine wave?
   (A) Function generator
   (B) Biphasic oscillator
   (C) RC phase shift oscillator
   (D) Wein bridge oscillator

18. What controls the output pulse width of a one shot multivibrator?
   (A) RC time constant
   (B) RL time constant
   (C) The clock frequency
   (D) The width of the clock pulse

19. What is the function of the comparators in 555 timer circuit?
   (A) To compare the output voltage to the interval voltage divider
   (B) To compare the input voltage to the external voltage divider
   (C) To compare the input voltage to the internal voltage divider
   (D) To compare the output voltage to the external voltage divider

20. How can a monostable multibvibrator be modified into a linear ramp generator?
   (A) Connect a constant current source to trigger input
   (B) Connect a constant current source to trigger output
   (C) Replacc resistor by constant current source
   (D) Replace capacitor by constant current source

PART – B (5 × 4 = 20 Marks)
Answer **ANY FIVE** Questions

21. Write short notes on feedback modes in an ideal Op-Amp.

22. With neat diagram, explain the working of an Op-Amp differentiator.

23. Compare the comparator with zero crossing detector.

24. Describe frequency multiplier and divider as an application of PLL.

25. Explain the function of flash type A/D converter.

26. List the important features of 555 timer.

27. What is an opto-isolator? Explain.

PART – C (5 × 12 = 60 Marks)
Answer **ALL** Questions

28. a. Explain the DC characteristics of Op-Amp in detail.

(OR)

b. Explain the AC characteristics of Op-Amp in detail.

29. a. Explain the following applications of an Op-Amp.
   (i) Antilog amplifier
   (ii) Clamper

(OR)

b. Explain the working of RC phase shift oscillator and derive the expression for its frequency of oscillation.

30. a. Derive the transfer function of second order high pass filter.

(OR)

b.i. Discuss about voltage controlled oscillator.

ii. How the PLL is used in frequency multiplication?

31. a. Explain how the IC 723 general purpose voltage regulator acts as a low and high voltage regulator.

(OR)

b. Explain the working of various types of DAC.

32. a. Describe 555 timer in monostable mode with neat diagram.

(OR)