**Roll No. ……………………………………………………………**

**NEELKANTH INSTITUTE OF TECHNOLOGY**

**B.Tech ENE (Semester IV)**

**PRE UNIVERSITY EXAMINATION 2014-2015**

**ANALOG AND DIGITAL ELECTRONICS (NEC-409)**

***Time: 3 Hours Total Marks 100***

***NOTE: - Attempt all the questions which carry equal marks.***

1. **Attempt any Four Part of the following the Questions: (5X4=20)**

1. Define LED and its construction and principle of operation, also draw the band diagram.
2. Compare the tunnel diode and conventional diode?
3. How transistor works as open& closed switch?
4. What is tunnel diode and also write down its characteristics and tunnelling phenomenon.
5. What is photo diode and explain construction and operation also draw the VI characteristics.
6. A LED is used to indicate the ON-OFF status of a DC power supply having a DC output Voltage of 5V. Draw the indicator circuit and specify the component value.
7. **Attempt any Four parts of the following Questions: (5X4=20)**

1. Mid band gain of an amplifier is 100 and if the half power frequencies are fl=40Hz and fh= 60 kHz calculate the amplifier gain at the frequencies 20 Hz and 20 KHz.
2. i. What is the significance of frequency response?

ii. What are the different region in Frequency response?

1. What is the high frequency response of a common emitter circuit and common source circuit?
2. An RC coupled amplifier having mid band gain is Av(mid)=80 and input resistance of 10K-ohm is fed from an ideal Voltage source through a coupling capacitor of 0.22 micro Farad calculate

i. The lower cut-off frequency

ii. The voltage gain at 400 Hz.

iii. The frequency at which gain is 10 dB down the mid band value.

1. What is the effect of negative feedback on amplifier parameter?
2. Write down the

i. Advantage and disadvantage of negative feedback.

ii. Compare all the Feedback topologies.

1. **Attempt any two parts of the following Questions: (10X2=20)**
2. For the Wein bridge Oscillator

i. Draw the circuit diagram.

ii. Find the frequency of oscillation

iii. Find the value of alpha and Beta.

1. What is Hartley oscillator and also derive the respective frequency expression and write advantage disadvantage and application of Hartley.
2. In a colpitt Oscillator of the desired frequency is 500Khz. Estimate the value of L and C. Explain the working of RC phase shift oscillator.
3. **Attempt any two parts of the following Questions: (10X2=20)**
4. i. Implement the following function using16:1 MUX.

ii. Implement the 2 bit up & down asynchronous counter.

1. i. SR latch using NAND gate and classify the different type of register.

ii. Universal Shift register and what is race around condition.

1. Design a Synchronous Decade counter using JK FF.
2. **Attempt any two parts of the following Questions: (10X2=20)**
3. (i) What is schmitt trigger? And also draw the diagram and types of schmitt trigger?

(ii) Draw the diagram of SMPS?

1. (i) Draw the block diagram IC 555 Timer.

(ii) Explain the it’s Mono-stable and Astable mode of working

1. Classify the memory and explain the concept of Memory organization and differentiate between SRAM and DRAM.