**Roll No. …………………………………………………………..**

**NEELKANTH INSTITUTE OF TECHNOLOGY**

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

**FIRST SESSIONAL EXAMINATION (IMPROVEMENT) 2014-2015**

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

***Time: 1:00 Hours Maximum Marks 30***

***NOTE: - i.*** *be precise in your Answer*

***ii.*** *All section are compulsory*

**SECTION A**

1. **Attempt any Five Question : 2X5=10**
2. An LED is connected across a voltage source of +10V through a series resistance of 820 Ohm. Calculate the LED current. Assume the voltage drop across an LED of 15 V.
3. **(i)** Define 'Dark Current' in photodiode.

**(ii)** Write any two applications of tunnel diode.

1. Draw the ***I-V*** characteristics of tunnel diode.
2. Why is silicon not preferred as an LED material?
3. Draw the small signal model of BJT. (Hybrid pi and T model).
4. A resistor R is placed parallel to a Ge tunnel diode. The tunnel diode has

Find the value of R so that the combination does not exhibit negative resistance region in Volt-ampere characteristics.

1. For an amplifier 3-dB gain is 200 and higher cut-off frequency is 20KHz. Find the gain of the amplifier at the frequency 100 KHz.

**SECTION B**

1. **Attempt any Four Questions: 5X4=20**

1. Write a short note on transfer function & frequency response curve an amplifier and & find out the gain magnitude and phase of the LOW pass RC circuit and also plot them with respect to frequency.
2. Define the term 3dB bandwidth, Corner frequency. Explain the miller theorem with all required expression (use capacitor)
3. How the construction of the Schottky barrier diode is different from conventional semiconductor diode? Describe its mode of operation.
4. Explain the characteristics of a varactor diode and mention how it can be used in a resonant circuit. Also list some of the applications of the varactor diode.
5. Explain indetail “Oscillator Design” using negative resistance behavior of Tunnel diode.
6. A transistor used as a switch has its emitter current increased from 15 to 20 mA. This caused the reading of an ammeter in base lead to increase from 0.32 mA to 0.48 mA. Calculate.